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International Journal of Epidemiology and Public Health Research

Research Article

Measures Utilized for Preventing Nosocomial Infections in The Labour Ward Among Nurses in Federal University Teaching Hospital, Owerri, Imo State

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Article Information

Received: September 05, 2025
Accepted: September 20, 2025
Published: September 26, 2025

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Citation: FIDELIS, MARY NDUBUISI, IBHAFIDON, AKHERE, NWAOBIALA, CHINENYE JENNIFER, AMA ABIGAIL ESENI., (2025) "Measures Utilized for Preventing Nosocomial Infections in The Labour Ward Among Nurses in Federal University Teaching Hospital, Owerri, Imo State". International Journal of Epidemiology and Public Health Research, 7(1); DOI: 10.61148/2836-2810/IJEPHR/168.

Abstract

The study examined measures utilized for preventing nosocomial infections in the labour ward among nurses in Federal University Teaching Hospital Owerri, Imo State. To direct the study, four (4) objectives with corresponding research questions and two (2) hypotheses were formulated. The study employed an institutional - based cross sectional descriptive survey design. The population of the study comprised all the 932 staff nurses from Federal University Teaching Hospital Owerri, Imo State. Taro Yamane formula was used to drawn a sample size of two hundred and eighty (280) nurses. Simple random sampling technique with replacement was used in selecting all the ten (10) wards related to maternal and neonatal care out of the existing thirty-four (34) wards/ departments. Purposive sampling technique was used to select twenty-eight (28) nurses from each of the selected wards. The researchers' self- structured questionnaire was the instrument used for data collection; two hundred and seventy-nine (279) copies of the questionnaire were properly filled and returned. This yielded 99.6% return rate. Data generated were analyzed using descriptive statistics of mean and standard deviation as well as inferential statistics of Chi-square ($\chi 2$) at 0.05 level of significance at appropriate degree of freedom. The result revealed that nurses had good practice of measures utilized for preventing nosocomial infections in mothers (=3.59) and fair practices in newborns (=3.25). Also, the result of the study revealed that the hypotheses postulated were significant. Based on the findings, the researchers recommended among others that health facilities management should provide every nurse with the opportunity for in-service training on infection prevention measures because it will help to promote the practice of IPC measures among them, and that the monitoring team should strictly supervise nurses to ensure compliance to IPC measures during the discharge of their duties in labour wards.

Key Words: Measures, Infection, Nosocomial Infection, Nurses, Prevention

Introduction

Nosocomial infections also known as hospital acquired infections (HAIs) is one of the most common public health concerns due to its role in increasing morbidity and mortality, prolong hospital stays, excessive healthcare resources utilization, and higher healthcare cost for patients and health care workers (HCW). The increase in cost could be attributed to added antimicrobial treatment and prolonged hospitalization. Hospital-acquired infections occur in patients during the provision of healthcare services in healthcare facilities.

They may manifest 48-72 hours after admission of a patient or 14 days after being discharged as revealed by Edet et al. (2017) Hoxha et al. (2021), Harzard et al. (2021) and Suljagic et al. (2021). The infection must have neither been there nor incubating prior to the patient's visit or admission to the healthcare facility according to World Health Organization (2010). Nosocomial infections occur in all patients irrespective of their age, social class, gender and other characteristics, and they are caused by pervasive pathogens such as bacteria, virus and fungi present in the air, on surfaces and equipment.

Nosocomial infections is a global health problem because it affect patients in both developed and developing countries in varying degrees.. For instance, World Health Organization (2010) in Maintainni and Anise (2021) reported that in developing countries, the risk of contracting nosocomial infections or hospital acquired infections is 20 times higher when compared with the risk in developed countries. Based on the foregoing, World Health Organization (2015) revealed that 5 -10% of all hospitalization in North America and Europe result in nosocomial infections, while it is more than 40% in Latin America, sub-Saharan Africa and Asia. Lakhani et al. (2020) and Iordanou et al. (2021) also revealed that the prevalence rate of nosocomial infection in North of America and some parts of Europe was 6% but about 40% in African countries. The findings from the above studies showed that nosocomial infection prevalence rate is higher in developing countries, Nigeria inclusive, than in developed countries. The variance may be attributed to factors such as poverty which is a contributory factor to lack of provision quality health care facilities.

Other factors that may predispose patients or healthcare workers to nosocomial infection include among others, housing too many patients in one room or ward, broken skin, breach of infection control practice and precaution, abuse of antibiotics and invasive procedures. Shahidah et al (2016) showed that inappropriate use of antibiotics; lack of proper and adequate health care facilitates such as isolation units, sinks and bed spaces; inappropriate waste management, and contaminated surfaces and equipment are some of the risk factors of nosocomial infection. Hospital acquired infection also known as nosocomial infections occur in all patients, although, Raoofi et al. (2023) reported that the prevalence rate is higher in transplants wards, intensive care unit (ICU), labour and neonatal wards more than in other wards. Irrespective of the varied prevalence rate in different wards, the consequences still remain increased morbidity and mortality in patients and health care workers, hence, the need for the prevention, through infection prevention and control (IPC) measures.

Infection prevention and control measures are important requirements for curbing nosocomial infection and safeguarding patients (Hageman, 2016). As identified by Ahmed et al. (2022), they include: hospital hygiene, adequate hand hygiene, proper use of personnel protective equipment, adherence to sepsis principles, and safe sharp disposal. In the same vein, Alhumaid et al. (2021) recommended standard precautions (including use of cough etiquette, gowns, gloves and eye protection) and isolation precaution used to interrupt the risk of pathogens transmission. Infection prevention measures in the labour ward as reported by Das et al. (2021) are limiting the number of vaginal touches, preventing accidental contact of hand with needle sticks, use of antibiotic prophylaxis to prevent caesarean wound infection, Observing hand hygiene and environmental hygiene, use of hydro alcoholics, use of protective equipment such as sterile glove when handling the newborn, breastfeeding of the newborn, changing infusion set, and applying prudential measures. The practice of these measures by nurses who are the largest treatment team in hospitals is essential in preventing nosocomial infections and reduction of morbidity and mortality associated with them.

In hospitals, especially in labour wards, nurses are important figures in the control of nosocomial infections. Nurses are responsible for and perform procedures like medication administration, wound dressing, sterilization and disinfection, transferring patient to another department, and assisting medical doctors during deliveries. They are more involved in contacts with patients than other health care workers; hence, nurses play a vital role in transmitting nosocomial infections. Therefore, having up–to-mark knowledge about infection prevention measures by nurses and showing corresponding professional practices compliance with infection control measures are necessary for preventing and controlling nosocomial infections (Sarani, et al., 2015). Compliance with infection prevention and control (IPC) measures which according to Ganczak et al. (2007); Mody et al. (2010) and Alhumaid et al. (2010) vary widely among nurses based on demographic characteristics such as years of experience and level of qualification was reported by Iliyasu, et al. (2018) to be high. Although they also reported inadequacy with regard to eye protection, avoidance of needle recapping, glove use when required, washing hands before and after patients' contact, use of face masks, avoidance of a used needle that is disassembled from a syringe, and implementation of precautions for the mother and her newborn among nurses.

The findings of Maintanni et al. (2021) revealed that nurses had good practice (mean = 4.21) of infection prevention measures.Ahmed et al. (2022) reported that nurses in their study had fair practice of IPC measures. Onvariables that influence the practice of infection control measures of nosocomial infection, studies have shown that having good knowledge on infection prevention measures is a predictor of good infection control practices. Sahiledengle, et al. (2018) reported that 95% healthcare workers with higher level of education had good infection prevention practices. Based on the foregoing, Alhumaid et al. (2021) reported that health care workers with higher level of education practiced infection prevention measures more than those with diploma. Tefere et al. (2023) also revealed that nurses with diploma practiced infection prevention and control measures less than those with masters and above. They also reported that nurses with fewer years of experience had good practice compared with those who had more years of work experience. This may be due to boredom associated with job monotony. The findings from Saidu et al. (2015) revealed that years of experience among nurses is a predictor of infection control practices. In the same vein, Almed et al. (2022) revealed that nurses showed good practice (mean score of 3.56) of infection prevention practices and that there was a statistically significant relationship between nurses' practice of infection prevention measures and their years of experience. Length of work experience was also significantly associated with practice of infection prevention as reported by Das et al. (2020).

Nosocomial infections have long been recognized as crucial factors bedeviling the quality and outcomes of health care delivery. Thus, the spread of infection serves as a major source of worry for health

care practice, particularly in developing countries where the health care system is already overstretched. The prevention of these infections in labour ward requires a reorganization of the service, the standards required in the national perinatal period, the fight against prematurity and the application of basic hygiene rules (WHO, 2016). Adequate knowledge of health-care associated infections, as well as the control measures to curb the festering of such ailments among nurses will surely bring to the fore the professional acumen and improve the efficacy of health administration. Several empirical studies (Raoofi et al., (2023); Ahmed et al. (2022); Lukhan, et al. (2020) and Ganczak & Szyeh (2007) have been conducted on nosocomial infection prevention practices but none of these studies to the best knowledge of the researchers addressed nosocomial infection prevention in the labour ward. This is the knowledge gap this study intends to fill.

Purpose of the Study

The purpose of the study was to determine the measures utilized for preventing nosocomial infections in the labour ward among nurses in Federal University Teaching Hospital Owerri, Imo State. Specifically, the study sought to determine:

1. The measures utilized for preventing nosocomial infections in mothers in the labour ward among nurses in Federal University Teaching Hospital Owerri, Imo State.
2. The measures utilized for preventing nosocomial infections in newborns in the labour ward among nurses in Federal Medical Centre, Owerri, Imo State.
3. The measures utilized for preventing nosocomial infections in mothers in the labour ward among nurses in Federal University Teaching Hospital Owerri, Imo State based on years of experience.
4. The measures utilized for preventing nosocomial infections in the labour ward among nurses in Federal University Teaching Hospital Owerri, Imo State based on academic qualifications.

Research Questions

The following research questions guided the study:

1. What are the measures utilized for preventing nosocomial infections in mothers in the labour ward among nurses in Federal University Teaching Hospital Owerri,, Imo State?
2. What are the measures utilized for preventing nosocomial infections in newborns in the labour ward among nurses in Federal University Teaching Hospital Owerri,, Imo State.
3. What are the measures utilized for preventing nosocomial infections in the labour ward among nurses in Federal University Teaching Hospital Owerri, Imo State based on years of experience.
4. What are the measures utilized for preventing nosocomial infections in the labour ward among nurses in Federal University Teaching Hospital Owerri, Imo State based on academic qualifications?

Hypotheses

The following hypotheses were formulated and tested at 0.5 level of probability:

1. There is no significant difference in the measures utilized for preventing nosocomial infections in the labour ward among nurses in Federal University Teaching Hospital Owerri, Imo State based on years of experience.
2. There is no significant difference in the measures utilized for preventing nosocomial infections in the labour ward among nurses in Federal University Teaching Hospital Owerri, Imo State based on academic qualification.

Materials and Method

An institutional-based cross-sectional study design was adopted for this investigation. The population comprised all 938 nurses in the 34 wards at FUTH, Owerri. (Source: Staff record unit). The sample size was determined using Taro-Yamane formula which yielded a sample size of 280 nurses. A simple random sampling technique with replacement was used to select all the 10 wards related to maternal and neonatal care out of the existing 34 wards/ departments wards namely; labour ward, intensive care unit, pediatric unit, special care baby unit 1and 2, ward extension, obstetrics ward, post natal ward, children out patient department and accident and emergency and then a purposive sampling technique was employed to drawn 28 nurses from each of the sample wards. Nurses who are on leave were not included in the study, in wards were the nurses were not up to 28, nurses from labour ward (which were up to 48 in number) were drawn to make up the sample size.

The researchers' self-structured questionnaire titled "Measure Utilized for Preventing Nosocomial Infection in the Labour Ward Questionnaire (MUPNILWQ)" was used as the instrument for data collection. The instrument consisted of three sections A, B. and C. Section 'A' contained 2 items on socio-demographic characteristics as regards their years of experience and qualifications. Section 'B' contained 5 items on measures utilized for nosocomial infection control in mothers while section 'C' contained 6 items on measures utilized for nosocomial infection control in newborns. A 4 –item Likert scale (ranging from strongly agreed, 4 to strongly disagreed 1) was used. The practice mean scores as adopted from Ahmed et al. (2022) were categorized into good (3.50 and above), fair (2.50- 3.49) and poor (1-2.49). The instrument was validated by 3 lecturers in the Department of Health Education, Alvan Ikoku Federal University of Education, Owerri. Cronbach's alpha was used to test the internal consistency among the items and index scores of 0.87 and 0.82 for section B & C were obtained. To gain access to the respondents, the researchers personally visited each of the wards and met with the Chief Nurse in charge of each of the ward. They were used as data collectors and they aided in the distribution and collection of the instrument which lasted for two weeks. Descriptive statistics of mean and standard deviation were used to analyze the research questions while inferential statistics of ANOVA was used to test the hypotheses at 0.05 level of significance.

Results

Table 1: Demographic Characteristics of Respondents (N=279).

S/N	Variable	Frequency	Percent (%)
1	**Level of experience**		
	0 – 9 years	81	29.1
	10 – 19 years	62	22.2
	20 – 29 years	69	24.7
	30 years and above	67	24.0
	Academic qualification		
	National Diploma	117	42.0
	Degree	110	39.4
	Masters	52	18.6

Table 1 showed the demographic profile of the respondents. It revealed that 29.1% of the respondents had 0-9 years of experience, 10-19 years (22.2%), 20-29 years (24.7), while 24.0% had 30 years and above. In terms of academic qualifications, 42.0% of the respondents had National Diploma (39.4%), while 18.6% had masters.

Research Question 1

What are the measures utilized for preventing Nosocomial Infections in mothers in the labour ward among nurses in FUTH, Owerri, Imo State?

Table 2: Measures utilized for preventing Nosocomial Infections in mothers in the labour ward.

S/N	Items	Mean	SD	Remarks
1	I wash my hands properly before touching a patient	3.86	0.341	Agreed
2	I limiting the number of vaginal touches to less than 5 after rupture of the membranes	3.72	0.447	Agreed
3	I use sterile gloves with long cuffs during uterine revision in Caesarean delivery	2.96	0.819	Agreed
4	I use of antibiotic prophylaxis to prevent Caesarean wounds infection	3.68	0.465	Agreed
5	I protect the uterus by sterile fields when it is externalised in case of delivery by Caesarean section	3.73	0.677	Agreed
	Grand Mean	**3.59**	**0.550**	**Agreed**

Key for interpretation:1- 2.49 (poor practice), 2.50-3.49(fair practice)., 3.50 and above (good practice)

Table 2 showed that overall; nurses in FUTH had good practice (3.59) of IPC in mothers. The result revealed that nurses in FUTH had good practice of proper hand washing before touching the patient, limiting the number of vaginal touches, use of sterile glove, antibiotics and sterile fields for caesarean delivery but fair practice of the use of sterile glove. The standard deviation showed that the respondents are homogenous in their responses.

Research Question 2

What are the measures utilized for preventing Nosocomial Infections in newborns in the labour ward among nurses in FUTH, Owerri, Imo State?

Table 3: Measures utilized for preventing Nosocomial Infections in newborns in the labour ward among nurses.

S/N	Items	Mean	SD	Remarks
1	I enforce breastfeeding of unpasteurized maternal milk to new born baby immediately after birth	3.68	0.465	Agreed
2	I putt on protective equipment when carrying the child after delivery	2.77	0.512	Agreed
3	I use of Hydroalcoholicin rubbing the hands before handling the newborn	2.56	0.787	Agreed
4	I wash your hands before caring for newborns	3.73	0.443	Agreed
5	I ensure environmental hygiene in the delivery room	3.82	0.383	Agreed
6	I opt for the promotion of vaccination of *Nimenrix* against meningitis in maternity	3.05	0.765	Agreed
	Grand Mean	**3.25**	**0.559**	**Agreed**

Table 3 showed that overall; nurses in FUTH had fair practice (3.25) of IPC in newborns. The result revealed that the nurses had good practice of items 1,4 and 5, fair practice of items2, 3 and 6 on the measures utilized for preventing Nosocomial Infections in newborns in the labour, ward. The standard deviation showed that they are homogenous in their responses.

Research Question 3

What are the measures utilized for preventing Nosocomial Infection in the labour ward among nurses in FUTH, Owerri, Imo State based on years of experience?

Table 4: Measures utilized for preventing Nosocomial Infection in the labour ward among nurses based on level of experience.

Level of experience	N	Mean	SD	Remarks
0 – 9 years	81	3.46	0.463	Agreed
10 – 19 years	81	3.38	0.568	Agreed
20 – 29 years	69	3.38	0.320	Agreed
30 years and above	67	3.40	0.409	Agreed

Table 4 showed that overall; nurses with 0-9years practiced IPC measures more than their counterparts with other years of experience. The result revealed differences in the measures utilized for preventing Nosocomial Infection in the labour ward among nurses based on their years of experience.

Research Question 4

What are the measures utilized for preventing Nosocomial Infection in the labour ward among nurses in FUTH, Imo State based on level of academic qualification?

Table 5: Measures utilized for preventing Nosocomial Infection in the labour ward among nurses based on academic qualification.

Academic qualification	N	Mean	SD	Remarks
National Diploma	136	3.51	0.505	Agreed
Degree	110	3.18	3.000	Agreed
Masters	52	3.41	0.442	Agreed

Table showed that overall; nurses with diploma (3.51) practiced IPC measures more than their counterparts with masters (3.41) and degree (3.18). The result revealed differences in the measures utilized for preventing Nosocomial Infection in the labour ward among nurses based on their levels of education.

Test of Hypotheses

H01: There is no significant difference in the measures utilized for preventing Nosocomial Infection in the labour ward among nurses in FUTH, Owerri, Imo State based on years of experience

Table 6: ANOVA analysis on the measures utilized for preventing Nosocomial Infection in the labour ward among nurses in FUTH based on years of experience.

Level of experience	N	Mean	SD	F	df	Sig.	Decision
0 – 9 years	81	3.46	0.463				.
10 – 19 years	81	3.38	0.568	279	30.291	0.463	Significant
20 – 29 years	69	3.38	0.320				
30 years and above	67	3.40	0.409				

From the analysis in Table 6, the statement of hypothesis 1 is rejected; implying that there is a significant difference in the measures utilized for preventing nosocomial infection in the labour ward among nurses in FUTH, Owerri, Imo State, based on years of experience. This is because, the p-value (Sig. = 0.000) is less than 0.05 alpha level.

H02: There is no significant difference in the measures utilized for preventing Nosocomial Infection in the labour ward among nurses in FUTH, Owerri, Imo State based on level of academic qualification.

Table 7: ANOVA analysis on the measures utilized for preventing Nosocomial Infection in the labour ward among nurses in FUTH based on academic qualification.

Academic qualification	N	Mean	SD	F	Df	Sig.	Decision
National Diploma	136	3.51	0.505				.
Degree	110	3.18	3.000	279	23.135	0.035	Significant
Masters	52	3.41	0.442				

From the analysis in Table 7, the statement of hypothesis 1 is rejected; implying that there is a significant difference in the measures utilized for preventing Nosocomial Infection in the labour ward among nurses in FUTH, Owerri, Imo State based on level of academic qualification. This is because, the p-value (Sig. = 0.035) is less than 0.05 alpha level.

Discussion

The study generated information on measures utilized for preventing nosocomial infections in the labour ward among nurses in FUTH, Owerri, Imo State. The findings were discussed below.

The finding in table 2 revealed that the respondents had good practice of measures utilized for preventing nosocomial infections in mothers in the labour ward. This is revealed by the table's grand mean score of 3.59. The finding corroborated with the findings of Rhule (2016) which showed that majority of the respondents (88.6%) practiced the universal infection control measures. This includes hand hygiene, use of adequate protective wear, proper sterilization, proper sharps disposal and safe waste management. The finding also agreed with the finding of Maintanni et al. (2021) who revealed that nurses had good practice (mean = 4.21) of infection prevention measures.

The finding in table 3 revealed that the respondents had a fair practice of the measures utilized for preventing nosocomial infections in newborns in the labour ward in FUTH, Owerri, Imo State. This is revealed by the table's grand mean score of 3.25. The finding is in agreement with Bukasa, et al., (2017) who reported that their respondents had a fair practice of washing hands when caring for newborns, hydroalcoholic friction of the hands before handling the newborn, promotion of vaccination against meningitis in maternity and practice the isolation of cases of neonatal infection. The finding is also consistent with the finding of Ahmed et al. (2022) who reported that nurses in their study had fair practice of IPC measure

The result in table 4 revealed that nurses with 0-9 years working experience practiced measures for the preventing nosocomial infection more than others with 10 years and above working experience. The finding agreed with the finding of Tefere et al. (2023) who reported that nurses with fewer years of experience had good practice of nosocomial infection prevention measures when compared with those who had more years of work experience. However, findings in Table 6 showed that there is significant difference in the measures utilized for preventing Nosocomial infection in the labour ward among nurses in FUTH, Owerri, Imo State based on years of experience. This is because, the p-value (Sig. = 0.000) is less than 0.05 alpha level. This is consistent with a similar study by Nofal, et al (2017) that indicated that level of experience significantly influenced the practice of Hospital Acquired Infections among nurses. The finding also agreed with the finding of Almed et al. (2022) who reported that nurses showed good practice (mean score of 3.56) of infection prevention practices and that there was a significant relationship between nurses' practice of infection prevention measures and their years of experience.

Findings in Table 5 revealed that nurses with diploma practiced measures for preventing nosocomial infection more than those with degree and masters level of education. The finding disagreed with the findings of Alhumaid et al. (2021) and Tefere et al. (2023) who reported that health care workers with higher level of education practiced infection prevention and control measures more than those with diploma. The variance may be attributed to the difference in the study settings. The finding in table 7 revealed a statistically significant difference in the practice of the measures for the preventing nosocomial infections in the labour ward among nurses based on level of academic qualifications. This is because, the p-value (Sig. = 0.035) is less than 0.05 alpha level.

Conclusions

Based on the findings, the following conclusions were made:

1. The nurses had good ($\bar{x}$=3.59) practice of the measures utilized for the preventing nosocomial infections in mothers in the labour ward.
2. The nurses had fair ($\bar{x}$=3.25) practice to the measures utilized for the preventing nosocomial infections in newborns in the labour ward
3. Nurses with 0-9 years of experience practiced to the measures utilized for the preventing nosocomial infections in the labour ward more than their counterparts with the other years of experience.
4. Nurses with diploma practiced to the measures utilized for the nosocomial infections in the labour ward more than their counterparts with degree and masters.
5. There was a statistically significant difference in the practice of the measures utilized for the preventing nosocomial infections in the labour ward among nurses based on years of experience.
6. There was a statistically significant difference in the practice of the measures utilized for the preventing nosocomial infections in the labour ward among nurses based on level of academic qualifications

Recommendations

Based on the findings and conclusions drawn, the researchers hereby recommend the following:

1) Health facilities management should provide every nurse with the opportunity for in-service training on infection control measures. This will help to promote the practice of IPC measures among them.
2) The monitoring team should strictly supervise nurses to ensure compliance to IPC measures during the discharge of their duties in labour wards
3) Health facilities management need to conduct routine and continuous health education and seminars for nurses on prevention and control of nosocomial infection especially for those with 10 years of experience and above, and those with degree and master levels of education s.
4) Regular sensitization seminar and health education should be conducted by health and nurse educators on the consequences of nosocomial infection, for healthcare workers, and for the entire hospital community.
5) Nurses should be given opportunities to upgrade as it could help in updating their knowledge of the IPC measures.

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