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**PROF. M. O. LIASU**  
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  - (a) Promoting a culture of excellence in Nursing Research.
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  - (c) Disseminating information on nursing related development that are not usually easily available to academics and practitioners.
3. The Journal will accordingly encourage the publication of the following categories of papers.
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4. LJN is published biannually in any area of nursing interest or relevant to needs of academics and practitioners.

In this volume, sixteen (16) manuscripts scale through the eye of the needle of the Editor-in Chief. The title of the papers in this edition are: Evaluation of Nurses' Actions and Opinion on Pain Assessment of Hospitalised Patients; Ultraviolet Radiation on Gunshot Wounds: Clinical Case Reports; Assessment of Knowledge and Compliance with Coronavirus Protocols Among Healthcare Professionals; Availability of Essential Components of Maternal Healthcare in Health Institutions; Factors Associated with Overweight and Obesity among Adolescents; Health-Seeking Behaviours, of Women Presenting with Advanced Stages of Breast Cancer: Sociocultural Beliefs and Practices on Placenta Disposal and Processing among Multiparous Women; Parental Control, Social Media Utilisation And Risky Sexual Behaviour Among Adolescents; Assessment of Nosocomial Infection Preventive Measures Utilized by Clinician Nurses in Intensive Care Unit; Alternative Medicine Use and its Perceived Effectiveness in Management of Hypertension; Assessment of Modern Contraceptives Uptake among Women of Reproductive Age; Community Health Extension Workers and Traditional Birth Attendants' Neonatal Resuscitation Practices of Babies Born with Asphyxia; Midwives' Current Screening Practice of Intimate Partner Violence among Pregnant Women in Northern Nigeria; Assessment of Cancer Patients' Quality of Life; Knowledge, Attitude and Practice of School Health Program among Secondary School Teachers and Traditional Birth Attendants' Knowledge of First-Aid Management and Skills of Selected Labour Emergencies in Ogbomosho, Oyo State, Nigeria: an Intervention Study.

## **EDITORIAL DESK**

Welcome to LAUTECH Journal of Nursing!

LAUTECH Journal of Nursing focuses on but not limited to research findings in the different areas of nursing: Nursing Care, Nursing Education, Medical Surgical Nursing, Maternal and Child Health Nursing, Community Public Health Nursing, and Psychiatric/Mental Nursing. This journal is published to promote quality scholarly writing and hence instigating and generating vibrant discourse in the different areas of nursing. Apart from providing an outlet for publications of research findings, it offers opportunities for professionals and students to disseminate their views or position on topical issues and emerging theories within the scope of the journal. The Journal is peer reviewed by seasoned scholar. Six-three authors have contributed in one way or the other to the tenth edition of the journal.

In this regard, the journal welcomes articles from individuals and corporate organisations for the ninth edition. Interested contributors may forward copy of their manuscript; computer-typed in double line spacing, using Times New Roman 12 point font, with abstract not more than 250 words on a separate page. Manuscript should not be more than 15 pages and sent to [doctoradeyemo@yahoo.com](mailto:doctoradeyemo@yahoo.com) or [lautechjournal@gmail.com](mailto:lautechjournal@gmail.com).

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# COMPARATIVE ASSESSMENT OF NOSOCOMIAL INFECTION PREVENTIVE MEASURES UTILIZED BY CLINICIAN NURSES IN INTENSIVE CARE UNIT OF SELECTED HOSPITALS IN ANAMBRA STATE, NIGERIA

EHWARIEME TIMOTHY A.; OMOROGBE CHRISTIE E. & NZELUEAKA HELEN A.

## ABSTRACT

*Nurse Clinicians are at a greater risk of acquiring and transmitting nosocomial infection as they have greater contact with patients and relatives more than any other member of the health team. A descriptive cross sectional survey design was adopted and a cluster sampling technique was used in the selection of 120 nurse clinicians from four (4) health facilities that were purposively selected, in Anambra state. The instrument for data collection was an adapted standardized questionnaire and checklist for infection control by WHO. Questionnaires were administered while the proforma/checklist was used to audit actual preventive measures used in the wards. Data were analysed using descriptive statistics while hypothesis tested with inferential statistics at 0.05 level of significance. The **result of this study observed** that the common preventive measures utilize by all the health facilities are; Hands being thoroughly washed immediately before handling and putting on gloves, soap or antiseptic rub wash being available at sink and toilet and instrument are thoroughly clean and rinsed before sterilization. We also found out that there is no significant difference between socio-demographic characteristics and utilization level of nosocomial preventive measures except for Registered nurse/ Intensive care nurse (RN/RICN) only that has significant relationship. It is therefore recommended that all stake holders in the health sector especially the hospital management who are responsible for the day-to-day smooth running of these hospitals including provision of the necessary materials and human resources.*

**Keywords:** Preventive measures; Nosocomial infections; Intensive care unit.

## INTRODUCTION

Nosocomial infections (NIs), also known as a hospital acquired infection are defined as infections which are acquired after 48 hours of patient's admission. Such infections are neither present nor incubating prior to a patient's admission to a given hospital (Liyasu, Dayyab, Habbib, Tihamiyu, Abubakar & Milinyawa, 2016). These are exogenous infections which are represented by the air, hospital floor and working staff of the hospital or endogenous infections in which the patient carries various types of microorganisms on his skin (Shaimaa, Mohammed, Waad and Khalid 2019). Such infection can appear within 30 days of postoperative procedure, or 90 days if there is an implant in place (CDC. Surgical site infection event, 2016). Hospital associated infections also include occupational infections due to occupational hazard in health care workers (Cherian & Rajesh 2018). There are various sorts of transmissions of these microorganisms and virus acquired through direct contacts between patients and doctors, as well as from patients to nurses and vice versa, associated with nursing infected surfaces through air, such as droplets, aerosols and so on and also commonly through common vehicles as food and water. (Lobo, Sams & Fernandez 2019).

Invasive devices such as catheters and ventilators employed in modern health care are associated to these infections (Centers for Disease Control and Prevention, 2016). Risk factors include lack of proper health care facilities such as isolation units, sinks and bed spaces, inappropriate waste management, contaminated equipment, inappropriate use of antibiotics and transmission of infection from the hands of healthcare workers and family caretakers due to inadequate hand hygiene practice (Shahida, Anisul, Bimalangshu, Ferdousi, Kartik, & Annekathryn, 2016). According to Khan, Ahmad, and Mehboob (2015), organisms that are frequently involved in hospital-acquired infections include *Streptococcus* spp., *Acinetobacter* spp.,

enterococci, *Pseudomonas Aeruginosa*, Coagulase-negative staphylococci, *Staphylococcus aureus*, *Bacillus cereus*, *Legionella* and Enterobacteria family members. These micro-organisms can be transferred from person to person, environment and contaminated water and food, infected individuals, contaminated health care personnel's skin or contact via shared items and surfaces.

Nosocomial infections go beyond their effects on morbidity and mortality in every country and have so many economic implications. According to the fact sheet of World Health Organization (WHO) there are several factors which can cause health care-associated infections. Among this is Prolonged and inappropriate use of devices and antibiotics, high-risk and sophisticated procedures, immunosuppression and other severe underlying patient conditions and insufficient application of standard precautions are some of the factors which present infection regardless of the resources available (WHO, 2017). De Oliveira, Kovner and Da sliva, cited in Mohammad nejad, Abbazadeh, Soori and Afhami (2016), Intensive Care Unit (ICU) nosocomial infection are primarily related to the patients' health status, invasive device utilization such as endotracheal tube, breathing with mechanical ventilators, central venous catheterization, use of immunosuppressors, prolong hospitalization, colonization by resistant microorganism, various antibiotics prescription and weaken the defensive mechanism. Nosocomial infection rate in ICU varies from 18 to 54%. It is responsible for 5 to 35% of all NIs and for approximately 90% of all outbreaks of diseases in an ICU.

Nurses are responsible for providing medications, dressing, sterilization, and disinfection. This makes them to be more in contact with patients than other health care workers (HCWs). Therefore, they are more exposed to various NIs (Shinde & Mohite, 2014). Hence, nurses play a vital role in transmitting NIs, and their compliance with infection control measures seems to be necessary for preventing and controlling NIs (Sarani, Balouchi, Masinaeinezhad & Ebrahimitabs, 2014). In this regard, utilization of preventive measures by nurses such as adopting safe antiseptic techniques in patient handling, hospital environmental sanitization and fumigation of infected areas, sterilization of instruments, disinfection surveillance system, training of staff on precautionary measures and control activities,

protocol for isolation units, rational antibiotic use is very paramount.

In addition to proper use of needle cutter, iatrogenic infection prevention, proper waste disposal with incineration and immunization coverage of hospital staff is very important (De Jonge , Boer, Essen, Dogterom-balling & Veldkamp 2019). Other measures include adequate use of gloves, adoption of safe practices for handling needle sticks and other sharp objects (Yakobo, Lamar & Henok 2015). These measures not only protect the patient but also the HCWs and the environment. However, implementation of these standard /precautionary measures is dependent on adequate knowledge and attitudes of HCWs including nurses. (Dimie, Kemebradikumo, Babatunde, George, Christian & Sansusi 2015).

Hospital-wide HAI prevalence varied between 2.5% and 14.8% in United Republic of Tanzania, Senegal, Burkina Faso and the Algeria (Odetola and Adekanye 2017). Overall HAI cumulative incidence in surgical wards ranged from 5.7% to 45.8% in studies conducted in Nigeria and Ethiopia (Odetola and Adekanye 2017). This Nigerian study reported an incidence as high as 45.8% and incidence density equal to 26.8 infectious per 1000 patient day in paediatric surgical patients (Odetola and Adekanye 2017).

Despite the availability of low-cost interventions for infection prevention and control, the compliance with standard infection control practices remains very low, particularly in low-income and middle-income countries (WHO, 2017) and this put the nursing personnel, patient and relative at a greater risk of acquiring and transmitting nosocomial infections. In clinical practice, the researchers have seen cases where health workers handle dirty linen with bare hands, put needles in the patient's mattress after giving injections, do not clean the stethoscope after each patient contact and do not wash hands regularly in the clinical environment.

Though various research studies exist on nosocomial infections, its incidence and prevalence rates, risk factors and epidemiology but very few focuses on nosocomial preventive measures utilized in the intensive care unit by health professionals especially nurses in Nigeria and especially in Anambra State. Therefore, this study was carried to assessed measured utilized by nurse clinicians in prevention of nosocomial infection in



intensive care unit in selected tertiary hospital, Anambra state, Nigeria.

**Objectives of the study**

- i. To identify the various measures actually utilized by nurse clinicians in prevention of nosocomial infection in intensive care unit of selected hospitals, Anambra State.
- ii. To determine the level of utilization of nosocomial preventive measures among nurse clinicians in intensive care unit of each selected hospitals Anambra State.
- iii. To assess the general level of utilization of nosocomial preventive measures among nurse clinicians in intensive care unit of each selected hospitals Anambra State.
- iv. To ascertain perceived factors affecting the utilization of the nosocomial preventive measures

**Hypotheses**

Ho1: There is no significant difference between facility A, B, C and D and the utilization of the nosocomial preventive measures.

Ho2: There is no significant difference between socio-demographical characteristics and the utilization of the nosocomial preventive measures.

**METHODOLOGY**

**Research design/setting:** A descriptive cross sectional survey design was adopted in this study. The study was conducted in four (4) purposively selected hospitals in Anambra state; for the purpose of confidentiality the hospital name was coded as health facility A, health facility B, health facility C, and health facility D all in Anambra State. Health facilities A and B are the two-government teaching hospital in Anambra state. While health facilities C and D are private owned hospital with a functional intensive care unit and are the most popular and command a great number of patronages from all around the state.

**Target population/sampling size:** Target population for this study comprises of all the nurses working in intensive care unit of the selected hospital which were one hundred and twenty (120). See breakdown in Table 1.

**Table 1: Target population**

Name of hospital	Number of nurses
Health facility A	
Neonatal intensive care unit	13 nurses
General/ adult intensive care unit	16 nurses
Anaesthology intensive care unit	8 nurses
	Total 37 nurses
Health facility B	
Special care baby unit (SCBU)	12 nurses
General / adult intensive care unit	18 nurses
	Total 30 nurses
Health facility C	
Neonatal intensive care ward	11 nurses
General / adult intensive care ward	14 nurses
	Total 25 nurses
Health facility D	
Special care baby unit (SCBU)	11 nurses
General/adult intensive care unit	15 nurses
	Total 26 nurses
<b>TOTAL</b>	<b>120 nurses</b>

(Hospitals record 2020)



All the target population that meets the research criteria were purposively selected for the study, because the numbers are few and a larger number is needed for better generalization of findings from the study.

**Inclusion criteria:** respondents must have been in the intensive care unit for a minimum of two (2) years, with a current practicing licence from Nursing and Midwifery Council of Nigeria

**Instrument for data collection:**

Two instruments were used in the study; an adapted standardized questionnaire of Centre for Disease Control guidelines (2018) and observational checklist adapted from WHO's guidelines on prevention of hospital acquired infections (2014). The questionnaires were divided into four sections. **Section A:** contains seven (7) questions on the socio-demographical information of the respondents. **Section B** is made up of 18 closed-ended questions on the level of utilization of nosocomial infection preventive measures. A 4-point Likert scale with an average mean score of 2.5 was used, a mean score <2.5 was regarded as poor utilization nosocomial infection preventive measures while a mean score >2.5 was regarded as good utilization of nosocomial infection preventive measures.

The second instrument was proforma/checklist adapted from WHO's guidelines on prevention of hospital acquired infections (2014). The proforma/checklist was used to audit the actual measures utilized in prevention of nosocomial infections in the various intensive care unit.

**Validity/reliability of the instrument**

The instrument was subjected to face and content validity by two experts; one in measurement and evaluation and the second one disease control and prevention in the hospital. Reliability of the instrument were established by administering the questionnaire to 10% of the study population who are nurses working in the intensive care unit of a tertiary hospital in Benin City. Data generated were

analysed using split half reliability test and the Cronbach alpha value was 0.83.

**Method of data collection:** four research assistants who were nurses in each of the hospital were recruited and trained for the purpose of data collection. The questionnaires were administered after informed consent were obtained from the respondents, filled and retrieved immediately. Using the observation checklist, the researcher makes an indirect observation in the intensive care unit of the various hospitals on the nosocomial infections' measures used by the nurses. Whatever measures observed being used was checked against what is on the checklist.

**Ethical considerations:** Ethical clearance certificate with reference number MH/AWK/M/321/343 was obtained from Anambra state ministry of health ethical and research committee after submission of the proposal and approval of same. Permission was also obtained from the head of intensive care unit of the various health facilities. To maintain confidentiality and anonymity, no personal identifier was used or indicated on any document or questionnaire.

**RESULTS**

**Socio-demographic characteristics of respondents**

Table 2 shows demographic data of respondents. It shows that 43(35.8%) in the age range of 30-39 years, 49(40.8%) between 40-49 years, 40 (33.3%) were males, 80(66.7%) were females. 102 (85%) were married, 18(15%) were single. Majority 93 (77.5%) were registered nurses/intensive care nurses. 73(60.8%) had 4-10 years working experience, half 60(50.0%) have been working in the current unit for 5-10 years.

	Frequency	Percentage
Age		
0-29 years	19	15.8
30-39 years	43	35.8
40-49 years	49	40.8
50 and above	9	7.5
Gender		
Male	40	33.3
Female	80	66.7
Marital Status		
Married	102	85.0
Single	18	15.0
Other	0	0.0
Nursing Category		
Registered nurse/ Intensive care nurse (RN/RICN)	93	77.5
Registered nurse/Registered midwife (RN/RM)	15	12.5
Registered nurse (RN) only	7	5.8
Registered nurse (RN)with other specialties	5	4.2
Years practiced as a nurse		
2year	1	0.8
2-3 years	19	15.8
4-10 years	73	60.8
10 and above	27	22.5
Employment Status		
Full time	115	95.8
Contract	5	4.2
Agency	0	0.0
Other	0	0.0
How long have you worked in the current nursing unit/department		
0-2 years	14	11.7
2-4 years	19	15.8
5-10 years	60	50.0
10 and above	27	22.5

Table 3 below shows checklist results as observed by the researcher in the intensive care unit of the various hospitals. It shows that the only preventive measures common to all the health facilities are; Hands being thoroughly washed immediately before handling and putting on gloves, soap or antiseptic rub wash being available at sink and toilet and instrument are thoroughly clean and rinsed before sterilization. However, there are some measures that are either partially utilized or

nurses are not consistent in utilizing them. These measures include; Staff are not separating and disposing of ward waste properly, ceiling, walls and floor not kept clean, Personal protective clothing and equipment not properly used (goggle boots apron etc.), post exposure prophylaxis (PEP) in place and is in use. In some of the health facility there were no operating incinerators, Blood spills are not cleaned by flooding with a disinfectant and then wiped off.

**Table 3: Measures utilized by nurse clinicians in prevention of nosocomial in the intensive care unit**

Actual measures utilized by nurses in the various hospital as observed	Health facilities			
	A	B	C	D
1.Hands are thoroughly washed immediately Before handling and putting on gloves				
2.hands are thoroughly washed After handling object which might be contaminated			-	
3.After contact with blood or mucus membrane		-		-
4.Sheets and blankets are cleaned and changed regularly	-		-	
5.Soiled linens are handled, stored and transported properly	-			
6.Patients are clean and have/are wearing clean panamas or gowns		-		-
7.Staff are separating and disposing of ward waste properly			-	-
8.sinks clean, disinfected, tidy and functioning	-	-	-	-
9.soap or antiseptic rub wash are available at sink and toilet				
10.Are ceiling, walls and floor clean	-	-	-	-
11. Are the rooms well ventilated			-	-
13.Personal protective clothing and equipment is available and properly used (goggle boots apron etc.)	-	-	-	-
14.Is there a post exposure prophylaxis (PEP) in place and is in use	-	-	-	-
15.The hospital has an operating incinerator	-	x	-	x
16.Needles, scalpel, blades and other sharp objects are disposed immediately after use			-	
17.Needles, scalpel, blades and other sharp objects are disposed in a puncture resistance container	-	-	-	-
18.All sharps container are removed when there are 3/4 full and taken to the incinerator or burial site	-	-	-	-
19.do not recap used needle before discard	-	-	-	-
20.Waste items are disposed of according to guideline; yellow, red and black	-		-	
21.Blood spills are cleaned by flooding with a disinfectant and then wiped off	-		x	x
22.Instruments are decontaminated in a 0.5 chlorine solution immediately after use	-	-	-	-
23.Instrument are thoroughly clean and rinsed before sterilization				

*Key: ( ) indicates that these measures were seen/observed being practice/utilized; (-) indicates that they were partially done and not consistent with its utilization, (x) not utilized or practice at all during the period of observations*

Table 4a shows that respondents exhibit good utilization of nosocomial preventive measures in all other items with (average mean >2.5) except items 8, 12, and 14 where the average mean is <2.5. The

overall level of utilization of nosocomial preventives measures among the respondents shows 88.3% of utilization level is high as against 16.7% poor utilization.

**Table 4a: Level of utilization of nosocomial preventive measures among Nurse clinicians in health facility A**

Items	SA (4)	A (3)	D (2)	SD (1)	Mean	St. D	RMK
1.I wash my hands before and after direct contact with the patient	29 (79.2)	8 (21.6)	0 (0.0)	0 (0.0)	3.783	1.02	Good utilization
2.I wear face mask and glasses when performing invasive and body fluid procedures	30 (81.1)	6 (16.2)	0 (0.0)	1 (2.7)	3.756	1.02	Good utilization
3.We have monitoring of the knowledge of infection prevention and control unit in my hospital	19 (51.3)	15 (40.7)	3 (8.0)	0 (0.0)	3.432	1.07	Good utilization
4.I attend in-service training/workshop related to infection prevention and control yearly to update my knowledge and skills on infection control	26 (70.2)	4 (10.8)	4 (10.8)	3 (8.1)	3.432	1.07	Good utilization
5.Surgical operation sites are shaved with sterilized blade	33 (89.2)	4 (10.8)	0 (0.0)	0 (0.0)	3.891	1.00	Good utilization
6.We use the latest infection and prevention guidelines as developed by WHO	21 (56.7)	8 (21.6)	4 (10.8)	3 (8.1)	3.216	1.11	Good utilization
7.We use barrier nursing in handling patients to prevent further spread of infection	30 (81.1)	6 (16.2)	0 (0.0)	1 (2.7)	3.756	1.02	Good utilization
8.Vaccination of staff against common pathogen is routinely conducted	4 (10.8)	7 (18.9)	6 (16.2)	20 (54.1)	1.864	1.33*	Poor utilization
9.Wearing of PPE when handling patient with contagious disease/infection	33 (89.2)	3 (8.0)	1 (2.7)	0 (0.0)	3.864	1.00	Good utilization
10.We carry out vulva care for female patient on catheterization to prevent infection	27 (72.9)	8 (21.6)	1 (2.7)	1 (2.7)	3.648	1.04	Good utilization
11.We do not recap used needle before discard to prevent needle prick injury and contact with body fluid	33 (89.2)	3 (8.0)	0 (0.0)	1 (2.7)	3.837	1.01	Good utilization
12.Shaking linens out to release dust from the linen	3 (8.0)	3 (8.0)	2 (5.4)	29 (78.3)	1.459	1.40*	Poor utilization
13.Used sharp objects are disposed in a sharp box	33 (89.2)	3 (8.0)	1 (2.7)	0 (0.0)	3.864	1.00	Good utilization
14.We practice one patient to one thermometer and sphygmomanometer to prevent spread of infection	2 (5.4)	4 (10.8)	2 (5.4)	29 (78.4)	1.432	1.41*	Poor utilization
15.We practice carbonization of bed after patient is discharged	32 (86.5)	4 (10.8)	1 (2.7)	0 (0.0)	3.837	1.01	Good utilization
16.Disinfection of equipment after use	24 (64.8)	12 (32.4)	0 (0.0)	1 (2.7)	3.594	1.05	Good utilization
17.Disinfection of infected patient waste product before discard	33 (89.2)	3 (8.0)	0 (0.0)	1 (2.7)	3.837	1.01	Good utilization
18.Used needles or sharps are disposed in sharp box	32 (86.5)	3 (8.1)	0 (0.0)	2 (5.4)	3.756	1.03	Good utilization
Overall average grand mean					3.527	1.11	

Percentage of poor to good utilization of nosocomial preventive measure among respondents		
Classification	Frequency(f)	Percentage (%)
Poor utilization	3	16.7
Good utilization	15	83.3

*Average mean of 2.5 and above is regarded as good utilization while below 2.5 is poor utilization of preventive measures*

Table 4b shows that respondents exhibit good utilization of nosocomial preventive measures in all other items with (average mean >2.5) except items 8, 12, 14, 15 and 17 where the average mean is <2.5.

The overall level of utilization of nosocomial preventives measures among the respondents shows 72.2% good utilization as against 27.8% poor utilization.

**Table 4b: level of utilization of nosocomial preventive measures among nurses in facility B n=30**

Items	SA (4)	A (3)	D (2)	SD (1)	Mean	St.D	RMK
1.I wash my hands before and after direct contact with the patient	23 (76.7)	7 (23.3)	0 (0.0)	0 (0.0)	3.766	1.14	Good utilization
2.I wear face mask and glasses when performing invasive and body fluid procedures	24 (80.0)	5 (16.7)	0 (0.0)	1 (3.3)	3.733	1.14	Good utilization
3.We have monitoring of the knowledge of infection prevention and control unit in my hospital	15 (50.0)	12 (40.0)	3 (10.0)	0 (0.0)	3.400	1.20	Good utilization
4.I attend in-service training/workshop related to infection prevention and control yearly to update my knowledge and skills on infection control	21 (70.0)	3 (10.0)	3 (10.0)	3 (10.0)	3.400	1.20	Good utilization
5.Surgical operation sites are shaved with sterilized blade	26 (86.7)	4 (13.3)	0 (0.0)	0 (0.0)	3.866	1.12	Good utilization
6.We use the latest infection and prevention guidelines as developed by WHO	17 (56.7)	6 (20.0)	3 (10.0)	4 (13.3)	3.200	1.24	Good utilization
7.We use barrier nursing in handling patients to prevent further spread of infection	24 (80.0)	5 (16.7)	0 (0.0)	1 (3.3)	3.733	1.14	Good utilization
8.Vaccination of staff against common pathogen is routinely conducted	3 (10.0)	5 (16.7)	5 (16.7)	17 (56.6)	1.800	1.49*	Poor utilization
9.Wearing of PPE when handling patient with contagious disease/infection	26 (86.7)	3 (10.0)	1 (3.3)	0 (0.0)	3.833	1.13	Good utilization
10.We carry out vulva care for female patient on catheterization to prevent infection	21 (70.0)	6 (20.0)	2 (6.7)	1 (3.3)	3.566	1.17	Good utilization
11.We do not recap used needle before discard to prevent needle prick injury and contact with body fluid	26 (86.7)	3 (10.0)	0 (0.0)	1 (3.3)	3.800	1.13	Good utilization
12.Shaking linens out to release dust from the linen	3 (10.0)	3 (10.0)	2 (6.7)	22 (73.3)	1.566	1.54*	Poor utilization
13.Used sharp objects are disposed in a sharp box	26 (86.7)	3 (10.0)	1 (3.3)	0 (0.0)	3.833	1.13	Good utilization

14. We practice one patient to one thermometer and sphygmomanometer to prevent spread of infection	1 (3.3)	3 (10.0)	2 (6.7)	24 (80.0)	1.366	1.58*	Poor utilization
15. We practice carbonization of bed after patient is discharged	1 (3.3)	4 (13.3)	1 (3.3)	25 (83.3)	1.433	1.56*	Poor utilization
16. Disinfection of equipment after use	19 (63.3)	9 (30.0)	0 (0.0)	2 (6.7)	3.500	1.19	Good utilization
17. Disinfection of infected patient waste product before discard	4	4	2	20	1.733	1.51*	Poor utilization

Table 4c shows that respondents exhibit good utilization of nosocomial preventive measures in all other items with (average mean >2.5) except items 6, 8, 9, and 12, where the average mean is <2.5. The

overall level of utilization of nosocomial preventives measures among the respondents is utilization (77.7%) high as against 22.3% poor utilization.

**Table 4c: level of utilization of nosocomial preventive measures in health facility C n=25**

Items	SA (4)	A (3)	D (2)	SD (1)	Mean	SD	RMK
1. I wash my hands before and after direct contact with the patient	20 (80.0)	5 (20.0)	0 (0.0)	0 (0.0)	3.800	1.24	Good utilization
2. I wear face mask and glasses when performing invasive and body fluid procedures	20 (80.0)	2 (8.0)	0 (0.0)	3 (12.0)	3.560	1.28	Good utilization
3. We have monitoring of the knowledge of infection prevention and control unit in my hospital	12 (48.0)	10 (40.0)	2 (8.0)	1 (4.0)	3.320	1.33	Good utilization
4. I attend in-service training/workshop related to infection prevention and control yearly to update my knowledge and skills on infection control	18 (72.0)	3 (12.0)	2 (8.0)	2 (8.0)	3.480	1.30	Good utilization
5. Surgical operation sites are shaved with sterilized blade	22 (88.0)	3 (12.0)	0 (0.0)	0 (0.0)	3.880	1.22	Good utilization
6. We use the latest infection and prevention guidelines as developed by WHO	3 (12.0)	5 (20.0)	4 (16.0)	13 (52.0)	1.920	1.61*	Poor utilization
7. We use barrier nursing in handling patients to prevent further spread of infection	20 (80.0)	4 (16.0)	0 (0.0)	1 (4.0)	3.720	1.25	Good utilization
8. Vaccination of staff against common pathogen is routinely conducted	3 (12.0)	5 (20.0)	4 (16.0)	13 (52.0)	1.920	1.61*	Poor utilization
9. Wearing of PPE when handling patient with contagious disease/infection	22 (88.0)	1 (4.0)	2 (8.0)	0 (0.0)	3.800	1.24	Good utilization
10. We carry out vulva care for female patient on catheterization to prevent infection	2 (8.0)	2 (8.0)	1 (4.0)	20 (80.0)	1.440	1.71*	Poor utilization
11. We do not recap used needle before discard to prevent needle prick injury and contact with body fluid	22 (88.0)	2 (8.0)	0 (0.0)	1 (4.0)	3.800	1.24	Good utilization
12. Shaking linens out to release dust from the linen	2 (8.0)	2 (8.0)	1 (4.0)	20 (80.0)	1.440	1.71*	Poor utilization

13.Used sharp objects are disposed in a sharp box	22 (88.0)	1 (4.0)	0 (0.0)	2 (8.0)	3.720	1.25	Good utilization
14.We practice one patient to one thermometer and sphygmomanometer to prevent spread of infection	22 (88.0)	1 (4.0)	2 (8.0)	0 (0.0)	3.800	1.24	Good utilization
15.We practice carbonization of bed after patient is discharged	21 (84.0)	2 (8.0)	2 (8.0)	0 (0.0)	3.760	1.26	Good utilization
16.Disinfection of equipment after use	16 (64.0)	4 (16.0)	2 (8.0)	3 (12.0)	3.320	1.36	Good utilization
17.Disinfection of infected patient waste product before discard	(88.0)	(4.0)	(8.0)	(0.0)			utilization
18.Used needles or sharps are disposed in sharp box	22 (88.0)	0 (0.0)	2 (8.0)	1 (4.0)	3.720	1.25	Good utilization
<b>Overall average grand mean</b>					<b>3.353</b>	<b>1.18</b>	

**Percentage of poor to good utilization of nosocomial preventive measure among respondents**

Classification	Frequency(f)	Percentage (%)
Poor utilization	5	27.8
Good utilization	13	72.2

*Average mean of 2.5 and above is regarded as good utilization while below 2.5 is poor utilization of preventive measures*

Table 4d shows that respondents exhibit good utilization of nosocomial preventive measures in all other items with (average mean >2.5) except items 4, 8, 12, 14, 17 where the average mean is <2.5. The

overall level of utilization of nosocomial preventives measures among the respondents shows 72.3% good utilization as against 27.7% poor utilization



**Table 4d: level of utilization of nosocomial preventive measures in health facility D n-26**

Items	SA (4)	A (3)	D (2)	SD (1)	Mean	St.D	RMK
1.I wash my hands before and after direct contact with the patient	20 (76.9)	6 (23.1)	0 (0.0)	0 (0.0)	3.769	1.22	Good utilization
2.I wear face mask and glasses when performing invasive and body fluid procedures	21 (80.7)	4 (15.4)	0 (0.0)	1 (3.8)	3.730	1.23	Good utilization
3.We have monitoring of the knowledge of infection prevention and control unit in my hospital	13 (50.0)	10 (38.5)	2 (7.7)	1 (3.8)	3.346	1.30	Good utilization
4.I attend in-service training/workshop related to infection prevention and control yearly to update my knowledge and skills on infection control	3 (11.7)	5 (19.2)	4 (15.3)	14 (53.8)	1.884	1.59*	Poor utilization
5.Surgical operation sites are shaved with sterilized blade	23 (88.4)	2 (7.7)	0 (0.0)	1 (3.8)	3.807	1.21	Good utilization
6.We use the latest infection and prevention guidelines as developed by WHO	14 (53.8)	6 (23.1)	4 (15.4)	2 (7.7)	3.231	1.32	Good utilization
7.We use barrier nursing in handling patients to prevent further spread of infection	21 (80.7)	4 (15.4)	0 (0.0)	1 (3.8)	3.731	1.23	Good utilization
8.Vaccination of staff against common pathogen is routinely conducted	3 (11.7)	5 (19.2)	4 (15.3)	14 (53.8)	1.884	1.59*	Poor utilization
9.Wearing of PPE when handling patient with contagious disease/infection	23 (88.4)	2 (7.7)	1 (3.8)	0 (0.0)	3.923	1.19	Good utilization
10.We carry out vulva care for female patient on catheterization to prevent infection	19 (73.3)	6 (23.1)	0 (0.0)	1 (3.8)	3.653	1.24	Good utilization
11.We do not recap used needle before discard to prevent needle prick injury and contact with body fluid	23 (88.4)	2 (7.7)	1 (3.8)	0 (0.0)	3.923	1.19	Good utilization
12.Shaking linens out to release dust from the linen	2 (7.7)	2 (7.7)	2 (7.7)	20 (76.9)	1.461	1.67*	Poor utilization
13.Used sharp objects are disposed in a sharp box	23 (88.4)	2 (7.7)	0 (0.0)	1 (3.8)	3.653	1.24	Good utilization
14.We practice one patient to one thermometer and sphygmomanometer to prevent spread of infection	1 (3.8)	3 (11.5)	1 (3.8)	22 (84.6)	1.423	1.68*	Poor utilization
15.We practice carbonization of bed after patient is discharged	22 (84.6)	2 (7.7)	2 (7.7)	0 (0.0)	3.769	1.22	Good utilization
16.Disinfection of equipment after use	17	8	0	1	3.576	1.26	Good

**Percentage of poor to good utilization of nosocomial preventive measure**

Classification	Frequency(f)	Percentage (%)
Poor utilization	5	27.7
Good utilization	13	72.3

*Average mean of 2.5 and above is regarded as good utilization while below 2.5 is poor utilization of preventive measures*

Table 5 shows the level of utilization of preventive measures among nurses in the prevention of nosocomial infection. It shows that respondents exhibit good utilization of nosocomial preventive measures in all other items with (average mean >2.5) except items 8, 12, 14 and 17 where the average mean is <2.5. Surgical operation sites being shaved with sterilized blade (3.90±0.55), wearing of PPE when handling patient with

contagious disease/infection (3.87 ±0.35) and carbonization of bed after patient is discharged (3.86±0.35) as preventive measures with the highest mean among those items with good utilization. The overall level of utilization of nosocomial preventives measures among the respondents shows 77.8% good utilization as against 22.2% poor utilization.

**Table 5: General level of utilization of nosocomial preventive measures N = 120**

Items	SA (4)	A (3)	D (2)	SD (1)	Mean	St.D	RMK
1.I wash my hands before and after direct contact with the patient	95 (79.2)	25 (20.8)	0 (0.0)	0 (0.0)	3.78	0.56	Good utilization
2.I wear face mask and glasses when performing invasive and body fluid procedures	98 (81.7)	20 (16.7)	0 (0.0)	2 (1.7)	3.78	0.56	Good utilization
3.We have monitoring of the knowledge of infection prevention and control unit in my hospital	60 (50.0)	49 (40.8)	10 (8.3)	1 (0.8)	3.40	0.60	Good utilization
4.I attend in-service training/workshop related to infection prevention and control yearly to update my knowledge and skills on infection control	87 (72.5)	18 (15.0)	9 (7.5)	6 (5.0)	3.55	0.58	Good utilization
5.Surgical operation sites are shaved with sterilized blade	109 (90.8)	11 (9.2)	0 (0.0)	0 (0.0)	3.90	0.55	Good utilization
6.We use the latest infection and prevention guidelines as developed by WHO	69 (57.5)	28 (23.3)	20 (16.7)	3 (2.5)	3.35	0.60	Good utilization
7.We use barrier nursing in handling patients to prevent further spread of infection	98 (81.7)	21 (17.5)	0 (0.0)	1 (0.8)	3.80	0.34	Good utilization
8.Vaccination of staff against common pathogen is routinely conducted	14 (11.7)	25 (20.8)	22 (18.3)	59 (49.2)	1.95	0.17*	Poor utilization
9.Wearing of PPE when handling patient with contagious disease/infection	107 (89.2)	11 (9.2)	2 (1.7)	0 (0.0)	3.87	0.35	Good utilization
10.We carry out vulva care for female patient on catheterization to prevent infection	88 (73.3)	28 (23.3)	2 (1.7)	2 (1.7)	3.68	0.33	Good utilization
11.We do not recap used needle before discard to prevent needle prick injury and contact with body fluid	107 (89.2)	10 (8.3)	1 (0.8)	2 (1.7)	3.85	0.35	Good utilization
12.Shaking linens out to release dust from the linen	10 (8.3)	11 (9.2)	7 (5.8)	92 (76.7)	1.49	0.13*	Poor utilization
13.Used sharp objects are disposed in a sharp box	107 (89.2)	10 (8.3)	2 (1.7)	1 (0.8)	3.85	0.35	Good utilization

14. We practice one patient to one thermometer and sphygmomanometer to prevent spread of infection	5 (4.2)	12 (10.0)	7 (5.8)	96 (80.0)	1.38	0.12*	Poor utilization
15. We practice carbonization of bed after patient is discharged	105 (87.5)	13 (10.8)	2 (1.7)	0 (0.0)	3.86	0.35	Good utilization
16. Disinfection of equipment after use	79 (65.8)	40 (33.3)	0 (0.0)	1 (0.8)	3.64	0.33	Good utilization

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**Percentage of poor to good utilization of nosocomial preventive measure among respondents**

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Classification	Frequency(f)	Percentage (%)
Poor utilization	4	22.2
Good utilization	14	77.8

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*Average mean of 2.5 and above is regarded as good utilization while below 2.5 is poor utilization of preventive measures*

Out of the eleven (11) items, six (6); 1, Emergency situation serves as an obstacle to using preventive measures 5, Unavailability of equipment in the hospital 6. Patient may feel discomfort using some of these preventive measures, 7. Too busy/ lack of nursing personnel; 8. Lack of supervision from the infection control department makes it difficult to follow the infection prevention and control in the

hospital. 9. Insufficient support from the management in creating a facilitating work environment is a barrier to infection prevention has an average mean score of >2.5 which indicate that they are factors affecting utilization of nosocomial preventive measures among the respondents from the different health facilities. While others are not factors (X;<2.5).

**Table 6: Perceived factors affecting nurse clinicians utilization of nosocomial preventive measures in all the health facilities n=120**

	SD=1	D=2	A=3	SA=4	Mean	SD	Remark
1. Emergency situation serves as an obstacle to using preventive measures	26 (21.7)	6 (5.0)	5 (4.2)	83 (69.2)	3.21	1.26	Factor
2. Lack of Policies and implementation guideline	95 (79.2)	23 (19.2)	1 (0.8)	1 (0.8)	1.23	0.50	Not Factor
3. Lack of in-service training/workshop on recent infection prevention and control regularly	115 (95.8)	5 (4.2)	0 (0.0)	0 (0.0)	1.04	0.20	Not Factor
4. The workload affects my ability to apply infection prevention guidelines	115 (95.8)	1 (0.8)	1 (0.8)	3 (2.5)	1.10	0.51	Not Factor
5. Unavailability of equipment in the hospital	39 (32.5)	4 (3.3)	52 (43.3)	25 (20.8)	2.53	1.15	Factor
6. Patient may feel discomfort using some of these preventive measures	14 (11.7)	10 (8.3)	29 (24.2)	67 (55.8)	3.24	1.03	Factor
7. Too busy/ lack of nursing personnel	4 (3.3)	25 (20.8)	5 (4.2)	86 (71.7)	3.44	0.93	Factor
8. Lack of supervision from the infection control department makes it difficult to follow the infection prevention and control in the hospital.	9 (7.5)	7 (5.8)	20 (16.7)	84 (70.0)	3.49	0.91	Factor
9. Insufficient support from the management in creating a facilitating work environment is a barrier to infection prevention.	39 (32.5)	4 (3.3)	52 (43.3)	25 (20.8)	2.53	1.15	Factor
10. Lack adequate knowledge of nosocomial infection and chain of infection promotes my infection preventive practices.	108 (90.0)	10 (8.3)	2 (1.7)	0 (0.0)	1.12	0.37	Not Factor
11. My cultural belief makes it difficult for me to follow some infection control procedures.	99 (82.5)	20 (16.7)	1 (0.8)	0 (0.0)	1.18	0.41	Not Factor
Overall					2.18	0.76	-

? >2.5 =factors; <2.5 = not-factors

Table 7 shows the mean comparison of level of utilization across selected hospitals. Statistically significant difference in the mean level of

utilization across the selected hospitals is found. Scheffe Post hoc shows that there is no significant difference between facility A, B, C and D.

**Table 7: Mean comparison of utilization of nosocomial preventive measures across the different health facilities**

	Mean	Std. Deviation	F	P
Health facility A	1.81 <sup>a</sup>	0.17	6.472	0.000
Health facility B	1.64 <sup>b</sup>	0.18		
Health facility C	1.68 <sup>ab</sup>	0.15		
Health facility D	1.78 <sup>a</sup>	0.22		

*Mean with different superscripts are statistically significant at p<0.05*

Table 8 shows that Males are 12% more likely to have good level utilization than females. Respondents that are less than forty years 89% less likely to have good level of utilization than those 40years and above. Nurses that are registered nurse/ Intensive care nurse (RN/RICN) are six times more likely to have good level of utilization than other cadre of nurses. Nurses that have

practiced for 1 – 10years are 50% more likely to have good level of utilization than those that have practiced for more than 10years. This study indicates that Registered nurse/ Intensive care nurse (RN/RICN) is the only socio-demographic characteristic that has significant relationship with the utilization level of nosocomial preventive measures.

**Table 8: Multivariate logistic regression of socio-demographic characteristics and the utilization level of nosocomial preventive measures**

	P	O.R	95% C.I. for O.R
<b>Sex</b>			
Male	0.845	1.12	0.35-3.65
Female			
<b>Age group (Years)</b>			
0 – 39	0.872	0.89	0.22-3.65
40 and above			
<b>Nursing category</b>			
Registered nurse/ Intensive care nurse (RN/RICN)	0.008	5.57	1.57-19.78
Others			
<b>Years Practiced</b>			
1-10	0.701	1.50	0.19-12.01
>10			
<b>Years in Current place</b>			
1-10	0.175	4.23	0.53-33.99
>10			
Constant	0.046	0.20	
		<b>99(82.5)</b>	<b>21(17.5)</b>

## DISCUSSION OF FINDINGS

This study evaluates the nosocomial preventive measures utilized by Nurse clinicians in Intensive Care Unit of selected Hospitals in Anambra State, Nigeria. The demographic data of respondents shows that 43(35.8%) in the age range of 30-39 years, 49(40.8%) between 40-49 years, 40 (33.3%) are males, 80(66.7%) are females. 102 (85%) are married, 18(15%) are single. Majority 93 (77.5%) are registered nurses/intensive care nurses. 73(60.8%) have 4-10 years working experience, half 60(50.0%) have been working in the current unit for 5-10years.

This study notes that the only practices common to all the health facilities are; Hands being thoroughly washed immediately before handling and putting on gloves, soap or antiseptic rub wash being available at sink and toilet and instrument are thoroughly clean and rinsed before sterilization. This study disagrees with Sharif, Rashid, Tariq, Mashhadi, Mohi-ud-Din, Wazir, Dogar, Asif and Jadoon (2019) where poor hand practice are reported in Rawalpindi and Lemass, McDonnell, O'Connor, and as Rochford (2014) posits that hands are the most important vehicles of cross-infection, more also, hands of patients and health care practitioner can carry microbes to other body sites, equipment and staff therefore.

Findings from the study shows the utilization level of nosocomial preventive measures in Health Facility A is high (88.3%), Health Facility B is high (72.2%), Health Facility C is high (77.7%) and Health Facility D is high (72.3%). The writers posit that generally, level of utilization of nosocomial preventives measures among the respondents is very high due to their level of knowledge. The writers also believe that the high level of good utilization may be connected to the recent covid19 pandemic which has heighten awareness and awaken the zeal to adhere strictly to precautionary and infection preventive measures. Also, the covid19 pandemic has brought about continuous education on infection control measures through different medium that even non-health professional knows some of these measures.

The result of the overall level of utilization of nosocomial preventives measures among the respondents is very high (77.8%) This finding agrees with Alrubaiee, Baharom, Shahar, Daud and Basaleem, (2016) where most of the nurses (74.1%) have good practice on the actual actions utilized to

prevent Nisin Yemen) Also, this study is consistent with Osuala and Oluwatosin (2017) where respondents in eastern Nigeria shows that the mean practice score  $\pm$  SD was  $24.6 \pm 5.5$  and 120(60.9%) had a practice score of 60%. However, this study disagrees with the findings of Sharif, Rashid, Tariq, Mashhadi, Mohi-ud-Din, Wazir, Dogar, Asif and Jadoon (2019) where the practices of their respondents in Rawalpindi are poor. The poor practice reported in Rawalpindi may be due to lack of safe practice and inadequate supply of consumables as well as the socio-economic development of the country. Despite the knowledge that dirty hands play a significant role in the spread of health-care related pathogens, and that hand hygiene (HH) decreases the spread of these organisms, health-care worker's adherence with hand hygiene is poor. According to Lemass, McDonnell, O'Connor, and Rochford (2014), the hand are the most important vehicles of cross-infection, more also, hands of patients and health care practitioner can carry microbes to other body sites, equipment and staff therefore Hand hygiene is one of the most effective means of preventing nosocomial infections (Lemass et al., 2014).

This study also reveals that there are some measures either partially utilized or nurses are not consistent in utilizing them. These measures include; Staff are not separating and disposing of ward waste properly, ceiling, walls and floor not kept clean, Personal protective clothing and equipment not properly used (goggle boots apron etc.), post exposure prophylaxis (PEP) in place and is in use. In some of the health facility there are no operating incinerators, Blood spills are not cleaned by flooding with a disinfectant and then wiped off. All sharps container is not removed when there are 3/4 full and taken to the incinerator or burial site, do not recap used needle before discard, Instruments are not decontaminated in a 0.5 chlorine solution immediately after use. This result is in line with that of Desta et al (2015) where majority of the respondents have not worn goggle 108 (72%) and 107(71.34) does not vaccinate for the common pathogen, 50(33.3%) of healthcare workers doesn't use infection prevention supplies in northwest Ethiopia

The result in this study shows that perceived factors affecting nurse clinician utilization of nosocomial preventive measures in all the health facilities include: emergency situation serves as an obstacle to using preventive measures, Unavailability of



equipment in the hospital, Patient may feel discomfort using some of these preventive measures, Too busy/ lack of nursing personnel, Lack of supervision from the infection control department makes it difficult to follow the infection prevention and control in the hospital and insufficient support from the management in creating a facilitating work environment is a barrier to infection prevention. This study is consistent with Efstathiou, Papastavrou, Raftopoulos, and Merkouris (2011) who note in their study that compliance with standard precautions in order to avoid occupational exposure to nosocomial infections is a factor. The findings of this study are supported by Efstathiou et al (2011) in Cyprus and Olatade and Ifeoluwa (2021) in Ogun State Nigeria.

Findings reveal that there is no significant difference between facility A, B, C and D and the utilization of the nosocomial preventive measures. Result of this study indicates that there is no significant difference between socio-demographic characteristics and utilization level of nosocomial preventive measures except for Registered nurse/ Intensive care nurse (RN/RICN) only that has significant relationship. This study is not similar to Nofal, Subih and Al-Kalaldehy (2017) where gender, age being a registered intensive care nurse and years of experience are associated with good level of utilization of nosocomial preventive measures in Jordan.

#### CONCLUSION AND RECOMMENDATIONS

This study assessed measures utilized in prevention of nosocomial infection among nurse clinician in intensive care unit of selected hospitals, Anambra State. The result shows that there is high percentage of good utilization of nosocomial preventive measures, and this present intensity and vigor for infection control should be maintained. There are some factors identified that could hinder/ reduce the level of utilization. It is therefore recommended that each wards/unit in the Hospital should have an infection control unit that updates staff on infection control measures and ensures that nurses adhere to good infection control practices. It is therefore recommended that each wards/unit in the Hospital should have an infection control unit that updates staff on infection control measures and ensures that nurses adhere to good infection control practices. Updating knowledge and practice of nurses through

continuing in-service educational programs. Emphasizing the importance of following latest evidence-based practices of infection control and continuing education/training programs. Providing training programs for newly nurses about infection control and at regular intervals.

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