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The Strategies Utilized for Prevention of Nosocomial Infection in the Surgical Ward among Nurses in Nnamdi Azikiwe University Teaching Hospital Nnewi, Anambra

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ABSTRACT

Nosocomial infections remain a major public health concern worldwide, particularly in healthcare settings where nurses play a critical role in infection prevention and control. This study assessed the knowledge of nosocomial infections, the preventive strategies utilized, and the barriers encountered by nurses in preventing nosocomial infections at Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, Anambra State, Nigeria. A descriptive cross-sectional survey design was adopted for the study. The target population comprised 100 clinical nurses working in various wards of the hospital. Using Taro Yamane's formula, a sample size of 80 nurses was determined and selected through random sampling technique. Data were collected using a self-designed structured questionnaire that was validated by research experts and tested for reliability using the test-retest method. Data analysis was carried out using frequencies and percentages, and findings were presented in tables. The results showed that the majority of respondents were female (90.0%), married (90.5%), degree holders (72.1%), and within the age range of 31–40 years (37.5%). Findings revealed that nurses demonstrated a good level of knowledge regarding nosocomial infections, with an average of 70% of respondents providing correct responses on key infection-related concepts, transmission routes, and preventive measures. Regarding prevention strategies, most nurses reported adherence to recommended infection control practices, including hand hygiene before patient contact (83.8%), handwashing after exposure to body fluids (82.5%), and patient education (84.2%). However, several barriers to effective nosocomial infection prevention were identified, including limitations in language competency (92.5%), infection surveillance inefficiencies (88.7%), increased scrutiny due to public visibility of hospital-acquired infections (77.0%), increased reporting requirements (76.4%), and limited time to accomplish multiple goals (70.9%).The study concluded that nurses at NAUTH possess adequate knowledge of nosocomial infections and generally utilize appropriate preventive strategies. Nevertheless, organizational and operational barriers continue to hinder optimal infection prevention practices. The study recommends continuous professional education, improved infection surveillance systems, adequate staffing, and enhanced institutional support to strengthen infection prevention and control measures within the hospital setting.

Introduction

Nosocomial infection also known as Hospital Acquired Infections (HAI) is a localized or systemic infection acquired in a hospital or any other health care facility by a patient admitted for a reason other than the pathology present during admission. It may also include an infection acquired in a healthcare facility that may manifest 48 hours after the patient's admission into the health care facility or discharge (Hildron, Edwards, Patel, Horan, Sievert, Pollock & Fridkin, 2018). Epidemiological studies report that nosocomial infections are caused by pervasive pathogens such as bacteria, viruses and fungi present in air, surfaces or equipment . The pathogens are not present or incubating prior to the patient's admission into healthcare facility and are most likely transmitted by direct person-to-person contact during invasive medical procedures (Anderson, Kaye, Chen, Schmader, Choi, Sloan & Sexton, 2019). Some of the pathogens are highly resistant to antimicrobial agents, and this necessitates the prescription of more potent and costly antimicrobial agents.

Nosocomial infections are prevalent nationally and internationally; and occur in patients of all age groups: neonates, immuno-compromised adults and the elderly. The most frequent types of nosocomial infections are those associated with the urinary tract, surgical wounds, respiratory tract and blood stream. It is a serious global public health issue, causing the suffering of 1.4 million people across the world at any given time (WHO, 2018). Nosocomial infection in developing countries is difficult to address because it is such a complex problem with diverse underlying causes. International non-governmental organizations (INGOs) and inter-governmental organizations such as United Nations agencies add a unique perspective to the push for infection control measures in hospitals in the developing world. However, these organizations have not been able to address all facets of the problem such as infrastructure, leadership and individual health care worker behavior. Nosocomial infection control is not simply a matter of encouraging hand hygiene in settings where clean water and soap may not be consistently available. Nor is infection control a matter of providing supplies to health care workers who are not trained to use them properly (WHO, 2018).

The burden of HAI is already substantial in developed countries, where it affects from 5% to 15% of hospitalized patients in regular wards and as many as 50% or more of patients in intensive care units (ICUs) (WHO, 2019). In developing countries, the magnitude of the problem remains underestimated or even unknown largely because HAI diagnosis is complex and surveillance activities to guide interventions require expertise and resources (Pittet, Allegranzi, Storr, Nejad, Dziekan, Leotsakos, & Donaldson, 2018). Surveillance systems exist in some developed countries and provide regular reports on national trends of endemic HAI such as the National Healthcare Safety Network of the United States of America or the German hospital infection surveillance system. This is not the case in most developing countries because of social and health-care system deficiencies that are aggravated by economic problems (Pittet et al., 2018). Additionally, overcrowding and understaffing in hospitals result in inadequate infection control practices, and a lack of infection control policies, guidelines and trained professionals also adds to the extent of the problem.

In Nigeria, nosocomial infection rate of 2.7 % was reported from Ife, while 3.8 % from Lagos and 4.2 % from Ilorin (Odimayo, Nwabuisi, & Adegboro, 2018). The cause of nosocomial infections might be endogenous or exogenous. Endogenous infections are caused by organism present as part of the normal flora of the patient, while exogenous infections are acquired through exposure to the hospital environment, hospital personnel or medical devices . Nosocomial infection rates vary substantially by body site, by type of hospital and by the infection control capabilities of the institution. The proportion of infections at each site is also considerably different in each of the major hospital services and by level of patient risk (Taiwo, Fadiora, & Fayemiwo, 2018).This is exemplified by surgical site infections (SSIs) which are most common in general survey, whereas urinary tract infections and blood stream infections are most

frequent in medical services and nurses. Rates of nosocomial infection vary by surgical subspecialty, low in ophthalmology and high in general surgery. The differences are largely due to variations in exposure to high risk devices or procedures.

The area of birth is considered an infectious risk zone for confinement due to urinary tract infections, surgical site infections and endometritis to which they are exposed . It is also at risk for the newborn because of exposure to ocular, cutaneous and cord infections and early bacterial infection. It is for this reason that nosocomial infections in maternity are a reality concerning both mothers and newborns. However, it is estimated that 5 to 10% of patients acquire infection during their hospital stay. The risk varies according to the service: 28% in intensive care, 7% in surgery or medicine, 1.6% in gynecology and obstetrics. These INs cause at least 10 000 deaths per year and increase the duration of short-stay hospitalization by 2% to 5% (Van der Zwet et al., 2017).

The nosocomial infection constitutes an important over morbidity in neonatology, a major risk of mortality and a cause of additional costs, linked to the prolongation of stays. In addition, an estimated one million newborn deaths are associated with maternal infections before and during childbirth. Rates of maternal infections range from 0.8% for low births to 2.7% for post-caesarean births. In the newborn, the infection rate is about 0.2%. NIs in maternity are serious because they cause maternal morbidity and excess neonatal mortality. Infection remains the second leading cause of maternal mortality after bleeding (WHO, 2019). The prevention of these infections in neonatology 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. This study therefore aims at investigating the strategies utilized for prevention of nosocomial infection in the surgical ward among nurses in Nnamdi Azikiwe University Teaching Hospital Anambra state

Statement of the Problem

Nosocomial infection is a serious health problem worldwide and is a major concern for the safety of both patients and healthcare workers, especially with the outbreak of the novel Coronavirus, which has had many adverse effects on health and lifestyles of people around the world (Abbas, Nunes, Martischang, Zingg, Iten, Pittet, & Harbarth, 2020). Nosocomial infections have been recognized as a problem affecting the quality of health care and a principal source of adverse healthcare outcomes. Within the realm of patient safety, these infections have serious impact such as increased hospital stay days, increased costs of healthcare, economic hardship to patients and their families and even deaths, are among the many negative outcomes. In line with this, nurses and health workers should know how to prevent the transmission of nosocomial infections and be aware of the potential risks for patients in surgical wards, other staff, and visitors etc. It is with the above information the researcher carried out this study to investigate the strategies utilized for prevention of nosocomial infection in the surgical ward among nurses in Nnamdi Azikiwe University Teaching Hospital Nnewi.

Objectives of the Study

The purpose of this study was to investigate the strategies utilized for prevention of nosocomial infection in the surgical ward among nurses in Nnamdi Azikiwe University Teaching Hospital Nnewi ,Anambra state.

Specifically, the following objectives includes to;

1. Ascertain the knowledge of nosocomial infection among nurses in Nnamdi Azikiwe University Teaching Hospital.
2. Identify the strategies utilized for the prevention of nosocomial infection among nurses in Nnamdi Azikiwe University Teaching Hospital.
3. Identify the barriers faced by nurses towards nosocomial infection prevention in tNnamdi Azikiwe University Teaching Hospital
4. Find out Factors that enhances the strategies utilized for prevention of nocosomial infection in Nnamdi Azikiwe University Teaching Hospital

Research Questions

The following questions were formulated to guide the study based on the research objectives;

1. What is the level of knowledge of nosocomial infection among nurses in Nnamdi Azikiwe University Teaching Hospital?
2. What are the strategies utilized for the prevention of nosocomial infection among nurses in Nnamdi Azikiwe University Teaching Hospital?
3. What are the barriers faced by nurses towards nosocomial infection prevention in t Nnamdi Azikiwe University Teaching Hospital?
4. What are the factors that enhances the strategies utilized for prevention of nocosomial infection among nurses in Nnamdi Azikiwe University Teaching Hospital?

Significance of the Study

The findings of this study will be of significance to nurses, health workers, and other researchers. Seeing that health workers play a major role in mitigating the spread of nosocomial infections and their ability to adhere to standard infection prevention and control protocols is critical in controlling and preventing nosocomial infections, the health workers will find this study to be an important tool for counselling patients suffering from nosocomial infections. The findings in this study will aid nurses and midwives with deciding the most suitable infection preventive measure for a particular individual at a particular time. T on it treatment and prevention. Furthermore, the findings in this study will also serve as a resource material to researchers who wish to embark on related researches in the nearest future.

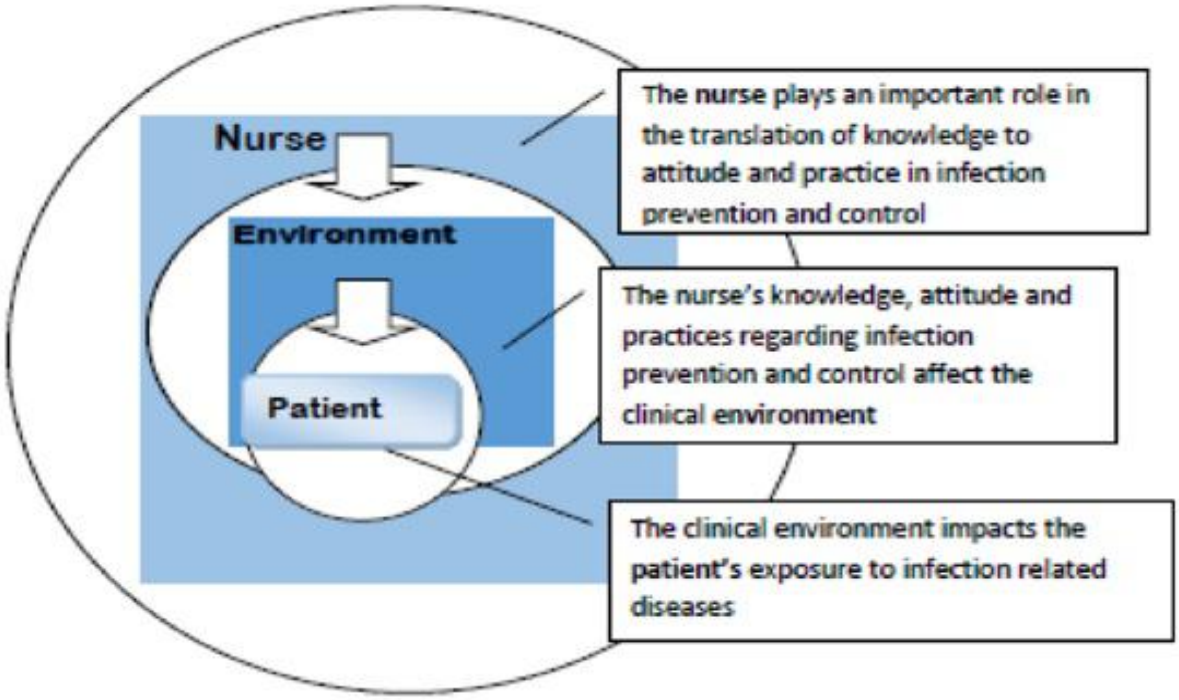
Scope of Study

"This study was delighted to investigate strategies utilized for prevention of nosocomial infection in the surgical ward among nurses in Nnamdi Azikiwe University Teaching Hospital Nnewi, Anambra with a focus on nurses currently working in the surgical ward.

Literature Review

Theoretical Framework

Florence Nightingale's theory on infection control was adopted for this study. The theory states that nurses have to provide a clean environment for the patient by promoting infection prevention and control in this case. The nurse plays an important role in the translation of knowledge to attitude and practice in infection prevention and control. Nightingale acted out prevention and control practices through her knowledge, attitude regarding infection prevention and control which placed the patient in the best possible position for healing (Gilbert, 2020). Nightingale stressed that cleanliness (sanitation, hygiene) and infection prevention and control measures in the clinical environment contribute to improving health care (Gilbert, 2020). The clinical environment impacts the patients' exposure to infection-related diseases. Nightingale focused on caring for the sick and placed emphasis on the importance of hygiene and patient care in infection prevention and control.



SOURCE: Florence Nightingale's theory (Gilbert, 2020)

Application of Theory to the Study

Environment: the health workers knowledge, attitude and practices in infection prevention and control affect the clinical environment, and poor evidenced based practice environment exposes the patient to infections. Isolation procedures, biomedical waste treatment and disposal should be well known by health workers in ensuring safe and clean environment to prevent the spread of infectious diseases in hospital environment.

Health workers: the knowledge and skills that the health workers acquires enable them to translate it into a positive attitude and good practice in preventing and controlling infection. Health workers have the responsibility to prevent the spread of infection in a clinical setup through proper management and disposal of waste generated from the hospital.

Patient: The clinical environment exposes the patient to hospital acquired infections. These infections have an impact on patient outcome such as delayed hospitalization and economic implications and (cost).

Empirical Review

A study was conducted by Yakob, Lamaro, and Henok, (2018) at Mizan-Aman General Hospital, South-West Ethiopia. A cross-sectional study design was employed. All HCWs (135) were included in the study. Self-administered questionnaire was used to collect data. Out of 135 respondents, 57 (42.2%) of HCWs thinks that, they apply standard precautions always. About two-third (65.6%) of them had ever participated in training program. All of the respondents know that dirty needle and sharp materials could transmit disease causing agents. More than three fourth (76.3%) of health care workers think that they were at risk of acquiring HIV in their work place. Among HCWs 59 (43.7%) of them disposed sharp materials in open pails, 91 (67.4%) in sharp and liquid proof container without removing syringe. 95 (70.4%) of health care workers know that gloves and gowns were required for any contact with patients. Among respondent 63 (46.8%) of health workers practice standard blood and body fluids precautions always. 103 (76.5%) of health care workers wears gloves last time where they took blood sample. 92 (68.7%) of health care workers wash their hands before examining the patient and 84 (62.5%) of health workers recap needles immediately after using them. Majority of health care workers' knowledge, attitude and practice towards standard precaution as a tool in prevention and control of nosocomial infection were not sufficient, favorable and safe enough to the expected standard.

A retrospective survey of records from the infection control unit of the University College Hospital, Ibadan, Nigeria, was done by Oni, Ewete, Gbaja, Kolade, Mutiu, Adeyemo, and Bakare (2018) for the years 2009-2013. For the five years studied 22,941 in-patients were reviewed and the data of those who developed infections during admission were retrieved and analyzed. The prevalence, types and causative organism of nosocomial infection were determined. The prevalence of Hospital Acquired Infection over the five years infection was 2.6% (95%). Surgical and medical wards have the most infections (48.3%) and (20.5%) respectively. Urinary Tract Infection and Surgical Site Infections (30.7%) were the most prevalent. UTI were significantly higher in surgical and medical wards and staphylococcus aureus being the predominant isolates (34.3%) and (20.1%) respectively (Oni et al. 2018).

Efforts to limit Nosocomial infection should be guided by local surveillance data if progress is to be made in improving the knowledge, attitude and practice of health care workers in ensuring quality of patient care in Nigeria.

Onyemocho, Anekoson, and Pius, (2018) assessed the level of knowledge and practice of injection safety among health-care workers of a Nigerian prison service health facility in Kaduna State Command. The findings of this study showed that n= 74 (54%) of health workers had good knowledge scores of key injection safety practice, n= 20 (17%) had fair knowledge while n= 40 (29%) had poor general knowledge scores. Furthermore, n= 70 (50%) of n= 138 prison health workers had fair practices of injection safety. Providers should use one sterile needle and one syringe only a single time (58). Each practice should have a policy in place that outlines the risk assessment, management and advice to staff following needle stick injury and blood and body fluid exposure. Education of all practice staff on sharps injuries, their significance, prevention and management are essential (Onyemocho, Anekoson, & Pius, 2018).

In the study by Simamora (2019) on the relationship of Nursing Behavior with Treatment of Nosocomial Infections in RSUS Delitua in 2018. The study was descriptive correlational, which identified the causal relationship between the behavior of nurses and the prevention of nosocomial infections in Sembiring Delitua General Hospital. Based on the results obtained, the respondents' knowledge and attitudes in Sembiring Delitua General Hospital in 2013 will be able to overcome nosocomial infections. say well according to the results of a good questionnaire and on the respondent's actions both based on the observations of the respondent's actions can be said to be good. Thus the researchers hope that the results can be a motivation in improving service quality in improving services for nosocomial infections for nurses.

In addition, AL-Salih, Muhbes, and Hindi (2018) sought to assess the nurses' knowledge about nosocomial infection, and to find out the relationship between nurses' knowledge about nosocomial infection and selected demographic variables. A descriptive study was conducted at burns' centers and units in the middle Euphrates teaching hospitals. The result of study was showed that the majority (69.8%) of nurses had (passed score) of knowledge regarding nosocomial infection in burns' units at middle Euphrates teaching hospitals.in addition, the present study pointed out there was a significant relationship between nurse knowledge and number of training courses about nosocomial infection. Nurses were pass knowledge in terms of nosocomial infections, prevention, control and precaution in patient care. Nurses age, gender, education, years of experience in-out burn unit have been not influenced their knowledge. Number of Nurses training courses have been affected their knowledge.

Similarly, Narasimhaiah and Moorthy (2018) adopted a quantitative research approach and one group of pre-test and post-test without a control group using pre-experimental design to assess the effectiveness of Structural Teaching Programme on Knowledge Regarding Prevention of Nosocomial Infection among Staff Nurses in Selected Paediatric Hospitals of Bengaluru, Karnataka, India. The overall pre-test knowledge scores of staff nurses on prevention of nosocomial infection among children was found to be 42.5% and the overall post-test knowledge scores was found to be 85.1% and

enhancement in the mean percentage knowledge score of 42.6% was found to be significant at 5% levels for all the aspects under study. There was significant association between post-test knowledge scores and selected demographic variables with professional experience ([chi square] = 8.42), experience in paediatric hospital (X2= 9.98), in-service education ([chi square] = 7.23), source of information ([chi square] = 15.64), type of family ([chi square] = 7.75), family income ([chi square] = 8.69), religion ([chi square] = 7.15), ability to recognise nosocomial infection ([chi square] = 16.54), intimate the presence of nosocomial infection ([chi square] = 9.41) and surveillance of the ward ([chi square] = 5.99). Overall findings showed that there is knowledge deficit among staff nurses regarding prevention of nosocomial infections in paediatric hospitals and structured teaching programme was effective in improving their knowledge.

Methodology

Research Design

A research design is a blueprint that provides the scientist with a detailed outline or plan for the collection and analysis of data. The study employed a quantitative descriptive survey design, using a self-designed questionnaire. This design were used in "prevalence and risk factors of hospital acquired urinary tract infection in a territory care hospital in Kaduna State by Mayon-White (2018).

Research Setting

The research setting for this study is at Nnamdi Azikiwe University Teaching Hospital.The Nnamdi Azikiwe University Teaching Hospital (NAUTH) is located in Nnewi, Anambra State, Nigeria. The hospital has a working capacity of 300 staff comprising of Doctors, Nurse-midwives, Physiotherapists, Radiologist and non-medical staff. The hospital is made up of sub-units such as medical wards, surgical wards, paediatric unit outpatient department, accident and emergency (casualty), theatre,obstetrics and gynaecology units and psychiatric unit. The department of nursing science is integrated with a 250 bedded Nnamdi Azikiwe University teaching hospitals so that nursing education, service and research are closely combined with quality patient/client care.

Target Population

The target population for this study comprised all clinical nurses in the ward of Nnamdi Azikiwe University Teaching Hospital in Anambra State. The people targeted were 100 nurses currently working in the hospital at the time of this study.

Sampling

The sample size is determined using the Taro Yamane's formula for calculating sample size. Taro Yamane, a mathematical statistician developed a statistical formula for calculating or determination of sample size in relation to the population under study so that inferences and conclusions reached after the survey can be generalized to the entire population from which the sample was gotten. The Taro Yamane's statistical formula is stated as follows;

$n = N / (1 + Ne^2)$

n= corrected sample size,

N = population size (N = 100)

e = Margin of error, e = 0.05 based on the research condition.

Therefore,

$n = 100 / 1 + (100 \times 0.05^2)$

$n = 100 / (1 + 0.25)$

$n = 100 / 1.25$

$n = 80$

Therefore, the sample size for this study was 80 clinical nurses.

Sampling Technique: The sampling technique used was the random sampling technique as this is suitable for a study of this nature with a case study. This sampling method involves drawing representative data by randomly selecting people from a population size because of the ease of their volunteering or selection units, availability and ease of access. Only clinical nurses that were available at the time of the study and consent to participate in the study were used for the study.

Instruments for Data Collection

A self-designed questionnaire was used as the instrument for eliciting data from the respondents. The copies of questionnaire will be self-administered among the clinical nurses. The questionnaire contained closed ended questions with multiple choice answers. The questionnaire

was divided into four sections (section A to D) with each section addressing a research objective. Section A consists of items to obtain the demographic data of the respondents; sections B to D contain items on the level of knowledge of nosocomial infection among nurses, the strategies utilized for the prevention of nosocomial infection in the surgical ward, and the barriers faced by nurses towards nosocomial infection prevention in the surgical ward in Nnamdi Azikiwe University Teaching Hospital, respectively. The items were developed to address the research questions and objectives.

Validity of Instrument

In this study, validity was achieved through cross-checking, inspecting and scrutinizing the information entered into the questionnaires and to ensure that the data that was obtained from the survey is accurate, relevant, complete, consistent and homogenous. In essence, face and content validity was ensured. This was done by the supervisor and research experts in Tansian University, to ensure the consistency of the research instrument with the research objectives, before it was used for the data collection procedure.

Reliability of Instrument

The reliability of the instrument was determined using test-retest method. The instrument was administered to 10 clinical nurses of comparable characteristics in Federal Medical Centre Onitsha, Anambra State who are not part of the sample size. The instrument was administered twice to the nurses at 2 weeks interval.

Method of Data Collection

The structured questions provided data that was objective and reliable for testing. The researcher ensured that the data collection process was properly administered. Research assistants were also carefully selected and trained on how to administer the questionnaires to the respondents. The data collection instrument was carefully administered, discussed and explained to the respondents for ease of understanding. This was done in Nnamdi Azikiwe University Teaching Hospital for ease of distribution and collection.

Method of Data Analysis

Data analysis is the technique used to reduce, organize and give meaning to data. Data generated for the study was analyzed using frequency and percentages. The results were presented in tables.

Ethical Consideration

A letter of introduction was obtained from the School and a written ethical clearance was obtained from the Ethical Committee of the Nnamdi Azikiwe University Teaching Hospital. This was sought for in order to involve their healthcare workers in the study and to objectively carry out the project work successfully. Several strategies were utilized to protect the healthcare workers' rights who agreed to participate in this study. First, oral verbal consent of the healthcare workers' was obtained prior to the administration of the questionnaire. The nurses were informed of the purpose of the study, and that they have the right to refuse to participate. Also the voluntary nature of participation was stressed and here information was kept confidential.

Results

Table 1: Socio-demographic characteristics of respondents

Variables	Options	Frequency (80)	Percentage (100%)
Age distribution	20 – 30 years	14	17.0
	31– 40 years	30	37.5
	41 – 50 years	24	30
	Above 50 years	12	15.5
Sex	Female	72	90.0
	Male	8	10.0
Level of education	Diploma nurses	12	14.6
	Degree nurses	58	72.1
	MSC nurses	11	13.3

Marital status	Married	72	90.5
	Single	8	9.5
	Others	-	-

The table above shows the socio-demographic characteristics of the nurses in Nnamdi Azikiwe University Teaching Hospital. From the findings, majority of the nurses (37.5%) fall into the age group of 31-40. Also, their level of education showed that more than half of the respondents were degree nurses (72.1%) while the other part were diploma nurses (14.6%) and MSC nurses (13.3%). Furthermore, the gender shows that majority of the respondents (90%) were female nurses while results showed that most of the respondents (90.5%) were married.

Research Question One: What is the level of knowledge of nosocomial infection among nurses in Nnamdi Azikiwe University Teaching Hospital?

Table 2:1 Knowledge of nosocomial infection among nurses

Knowledge	**Yes f(%)**	**No f(%)**
Nosocomial infection is an infection whose development is favored by a hospital environment	57 (71.7%)	23 (28.3%)
Nosocomial infections includes Ventilator associated pneumonia (VAP), Tuberculosis, Urinary tract infection, Gastroenteritis	58 (72.9%)	22 (27.1%)
HBV, HCV, Staphylococcus aureus and Pseudomonas aeruginosa are the organisms commonly encountered in nosocomial infections.	67 (83.3%)	13 (16.7%)
Gloves should always be worn in contact precautions	59 (73.7%)	21 (26.3%)
Standard precautions should include the use of protective equipment and frequent hand washing	54 (67.3%)	26 (32.7%)
Diagnosis influences my decision in choosing PPE	56(70.2%)	24(29.8%)
Patient history will influence my decision in choosing PPE.	60(74.9%)	20(25.1%)
Washing hands before and after handling patients helps to prevent infection	64(79.8%)	16(20.2%)
Wearing N95 mask is important when dealing with air born infection	58(72.9%)	22(27.1%)
Wearing surgical masks when doing surgical procedures are vital to prevent infection	67(83.7%)	13(16.3%)

The table above shows the level of knowledge of nosocomial infection among nurses in Nnamdi Azikiwe University Teaching Hospital. The findings revealed that 57 (71.7%) of the respondents know that nosocomial infection is an infection whose development is favored by a hospital environment, 58 (22.9%) know that nosocomial infections includes Ventilator associated pneumonia (VAP), Tuberculosis, Urinary tract infection, Gastroenteritis, 67 (83.3%) knew that HBV, HCV, Staphylococcus aureus and Pseudomonas aeruginosa are the organisms commonly encountered in nosocomial infections, 59 (73.7%) knew that Gloves should always be worn in contact precautions, 52 (67.3%) knew that Standard precautions should include the use of protective equipment and frequent hand washing. On the average, out of the total study participants 70% of the respondents had good knowledge of nosocomial infections.

Research Question Two: What are the strategies utilized for the prevention of nosocomial infection among nurses in Nnamdi Azikiwe University Teaching Hospital?

Table 3.2: Strategies utilized for the prevention of nosocomial infection among nurses in nauth

Attitude	Yes f(%)	No f(%)
Perform hand hygiene before touching a patient.	67 (83.8%)	13 (16.2%)
Perform hand hygiene before a clean/ sterile procedure.	59 (74.2%)	21 (25.8%)
Wash your hands with soap and water immediately after exposure risk to body fluids.	66 (82.5%)	14 (17.5%)
Perform hand hygiene after touching a patient.	52 (65.3%)	28 (34.7%)
Perform hand hygiene after touching any object or furniture in the patient's immediate surroundings.	57 (70.9%)	23 (29.1%)
Use of patient education	68 (84.2%)	12 (15.8%)

The table above showed the strategies utilized for the prevention of nosocomial infection in among nurses in Nnamdi Azikiwe University Teaching Hospital. The findings revealed that 67 (83.8%) of the respondents perform hand hygiene before touching a patient, 59 (74.2%) perform hand hygiene before a clean/ sterile procedure, 66 (82.5%) wash hands with soap and water immediately after exposure risk to body fluids, 52 (65.3%) perform hand hygiene after touching a patient, 57 (70.9%) perform hand hygiene after touching any object or furniture in the patient's immediate surroundings, and 68 (84.2%) use of patient education.

Research Question Three: What are the barriers faced by nurses towards nosocomial infection prevention in Nnamdi Azikiwe University Teaching Hospital?

Table 4.3: Barriers faced by nurses towards nosocomial infection prevention in nauth

Practice	Yes f(%)	No f(%)
High rate of nursing staff turnover	47 (59.2%)	33 (40.8%)
Time spent training new staff	56 (70.1%)	24 (29.9%)
Limitations in language competency	74 (92.5%)	6 (7.5%)
Heavy clinical workloads	51 (63.7%)	29 (36.3%)
Increased reporting requirements	61(76.4%)	19(23.6%)
Limited time to accomplish multiple goals	57(70.9%)	23(29.1%)
Infection surveillance inefficiencies	71(88.7%)	9(11.3%)
Increased scrutiny on hospitals due to public visibility of Hospital Acquired Infections	62(77.0%)	18(23.0%)

From the findings of the study in the table above on the barriers faced by nurses towards nosocomial infection prevention in Nnamdi Azikiwe University Teaching Hospital, it is revealed that the barriers include high rate of nursing staff turnover (59.2%), time spent training new staff (70.1%), limitations in language competency (92.5%), heavy clinical workloads (33.7%), increased reporting requirements (76.4%), limited time to accomplish multiple goals (90.9%), infection surveillance inefficiencies (88.7%), and increased scrutiny on hospitals due to public visibility of Hospital Acquired Infections (77.0%).

Discussion of Findings

Knowledge of nosocomial infection among nurses

The findings revealed that 57 (71.7%) of the respondents know that nosocomial infection is an infection whose development is favored by a hospital environment, 58 (22.9%) know that nosocomial infections includes Ventilator associated pneumonia (VAP), Tuberculosis, Urinary tract infection, Gastroenteritis, 67 (83.3%) knew that HBV, HCV, Staphylococcus aureus and

Pseudomonas aeruginosa are the organisms commonly encountered in nosocomial infections, 59 (73.7%) knew that Gloves should always be worn in contact precautions, 52 (67.3%) knew that Standard precautions should include the use of protective equipment and frequent hand washing. This was consistent with the findings of Yakob, Lamaro, and Henok, (2018) who revealed that all of the respondents know that dirty needle and sharp materials could transmit disease causing agents. More than three fourth (76.3%) of health care workers think that they were at risk of acquiring HIV in their work place, and 92 (68.7%) of health care workers wash their hands before examining the patient. This implies that most health care workers' knowledge, attitude and practice towards standard precaution as a tool in prevention and control of nosocomial infection were not sufficient, favorable and safe enough to the expected standard. Hence, the need to improve level of knowledge through regular training and in-training opportunities.

Strategies utilized for the prevention of nosocomial infection among nurses in Nnamdi Azikiwe teaching hospital

The findings revealed that 67 (83.8%) of the respondents perform hand hygiene before touching a patient, 59 (74.2%) perform hand hygiene before a clean/ sterile procedure, 66 (82.5%) wash hands with soap and water immediately after exposure risk to body fluids, 52 (65.3%) perform hand hygiene after touching a patient, 57 (70.9%) perform hand hygiene after touching any object or furniture in the patient's immediate surroundings, and 67 (84.2%) use of patient education. This was in alignment with the findings of AL-Salih, Muhbes, and Hindi (2018) who revealed that the majority (69.8%) of nurses had (passed score) of knowledge regarding nosocomial infection in burns' units at middle Euphrates teaching hospitals.in addition, and that they practiced standard precautions as a strategy to prevent nosocomial infection. Educational intervention through training courses have been shown to affect nurses' knowledge and should therefore be adopted by nursing managers to improve their practice.

Barriers faced by nurses towards nosocomial infection prevention in Nnamdi Azikiwe teaching hospital

The barriers faced by nurses towards nosocomial infection prevention in Nnamdi Azikiwe teaching hospital, were shown to include high rate of nursing staff turnover (59.2%), time spent training new staff (70.1%), limitations in language competency (92.5%), heavy clinical workloads (33.7%), increased reporting requirements (76.4%), limited time to accomplish multiple goals (90.9%), infection surveillance inefficiencies (88.7%), and increased scrutiny on hospitals due to public visibility of Hospital Acquired Infections (77.0%). This was supported by the findings of Narasimhaiah and Moorthy (2018) who revealed that institutional factors and a non-conducive environment affected the practice of preventive measures of nosocomial infection such as heavy workloads and few work force to meet the work demands among others. This implies that there is knowledge deficit among nurses regarding prevention of nosocomial infections in hospitals and structured teaching programme was effective in improving their knowledge. Also, health care institutions have a significant role to play in eliminating the identified barriers that nurses face in the practice of standard precautions to prevent nosocomial infections.

Summary of the Study

The primary objective of the study was to investigate the strategies utilized for prevention of nosocomial infection among nurses in Nnamdi Azikiwe University Teaching Hospital Nnewi, Anambra State. A cross sectional research design and 80 nurses were used as study participants. A self-structured questionnaire was developed according to the objectives of the study to guide in the generation of information. Socio-demographic characteristics of the respondents and the research question were analyzed using simple frequency and percentage. The findings revealed that 57 (71.7%) of the respondents know that nosocomial infection is an infection whose development is favored by a hospital environment, 58 (22.9%) know that nosocomial infections includes Ventilator associated pneumonia (VAP), Tuberculosis, Urinary tract infection, Gastroenteritis, 67 (83.3%)

knew that HBV, HCV, Staphylococcus aureus and Pseudomonas aeruginosa are the organisms commonly encountered in nosocomial infections, 59 (73.7%) knew that Gloves should always be worn in contact precautions, 52 (67.3%) knew that Standard precautions should include the use of protective equipment and frequent hand washing.

Furthermore, the findings revealed that 67 (83.8%) of the respondents perform hand hygiene before touching a patient, 59 (74.2%) perform hand hygiene before a clean/ sterile procedure, 66 (82.5%) wash hands with soap and water immediately after exposure risk to body fluids, 52 (65.3%) perform hand hygiene after touching a patient, 57 (70.9%) perform hand hygiene after touching any object or furniture in the patient's immediate surroundings, and 67 (84.2%) use of patient education. Lastly, the barriers faced by nurses towards nosocomial infection prevention in nauth were shown to include high rate of nursing staff turnover (59.2%), time spent training new staff (70.1%), limitations in language competency (92.5%), heavy clinical workloads (33.7%), increased reporting requirements (76.4%), limited time to accomplish multiple goals (90.9%), infection surveillance inefficiencies (88.7%), and increased scrutiny on hospitals due to public visibility of Hospital Acquired Infections (77.0%).

Conclusion

Despite the nurses being knowledgeable towards nosocomial infection prevention and control measures, the practices were very poor. However if nurses are knowledgeable and have a positive attitude towards infection prevention and control, and they are able to influence the patients then their practices are expected to be good. Furthermore, according to health belief model, the nurse plays an important role in the translation of knowledge and practices to the clinical environment for optimum health outcomes, it is concluded that the patients are exposed to nosocomial infections due to poor infection prevention and control practices. As a result of these findings the researcher has concluded that the barriers to good practice in infection prevention and control measures require further research.

Implication of Study to Nursing

According to the current study, it is evident that the practices of nurses in influencing infection prevention and control among patients were poor. Therefore the health facilities should strictly observe nurses as they practice standard precautions in order to ensure their safety and that of the patients that receive nursing care. This includes auditing of hand hygiene practices, observe the nurses as they perform invasive procedures, a procedure that requires aseptic technique, isolation of infectious conditions to prevent the spread of infection and application of barrier nursing.

Limitations of the Study

In the process of carrying out the current study, the researcher encountered some limitations. Firstly, since the focus of this study was on nurses in Nnamdi Azikiwe University Teaching Hospital, the conclusions drawn from this study cannot be overly generalized to other populations or areas. However, it can be extended to nurses within health facilities sharing similar characteristics and attributes. Secondly, the researcher faced time constraints, financial constraints as well as access to materials relevant to the research. Despite these, the study was carried out amongst other academic activities and the researcher maximized the time available.

Recommendations

The following recommendations were made based on the findings of the study;

1. Firstly, tertiary institutions and nursing schools should emphasize the importance of infection prevention and control (nosocomial infections) in the syllabus. This is to prepare the nursing students for their actual clinical practice to be effective once in practice.
2. Secondly, the infection control committee and regulatory bodies should be more proactive so that they can effectively monitor the rate of Hospital Acquired infections as well as give feedback to nurses and relevant authorities.
3. Lastly, there is a need for improvement in the nurse-patient relationship. This involves positive attitudes towards the patients, as well as information flow to the patients in

the infection prevention and control measures specific to their cases. This will serve as a motivation on the part of the patients to adhere to the standard precautions and improve health outcomes.

Suggestion for Further Studies

Further research of a qualitative type (to make the study more representative and to decrease bias) is required on the clinical nurses' level of adherence and barriers to the practice of universal standard precautions to prevent nosocomial infection. Also, similar studies should be conducted in other health care settings.

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