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Knowledge and Prevention of Nosocomial Infection among Ward Nurses at Federal Medical Centre, Umuahia, Nigeria

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Knowledge and Prevention of Nosocomial Infection among Ward Nurses at Federal Medical Centre, Umuahia, Nigeria

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Abstract

This research was conducted for estimating the knowledge and prevention of nosocomial infection among ward nurses at Federal Medical Centre (FMC), Umuahia Abia state. Four objectives were set, and four questions were formulated. A descriptive survey research method was used for the study. A sample size of one hundred and fifty (150) nurses was drawn from eight wards (medical and surgical), at FMC, Umuahia. A self-developed questionnaire with seventeen (17) structured questions was the instrument of data collection. Data were collected, analyzed, and presented in tables, pie chart, bar chart, histogram, and percentages. The results revealed that the nurses were well knowledgeable about nosocomial infection, although little deficiencies existed in the area of infection control practice and compliance, such as hand washing frequency. This study therefore recommends continuing education/seminar/workshop for all health care givers, to sensitize them with the knowledge and practice of nosocomial infection.

Keywords: Nosocomial; Infection; Nurses; Wards.

1. INTRODUCTION

Infection in the hospital is as old as the disease itself. Frequently, patients present with disease other than their primary complaints, if that happens during hospitalization, then it is termed nosocomial/hospital acquired or health care associated infection [1]. According to Rick [2], nosocomial infection is an infection manifested by patients 72 h after the patient's visit/admission to the hospital for hospital care. The infection must have neither been there nor incubating prior to the patient's visit/admission to the hospital. Ducel and Benson [3] extended it to 14 days after discharge. Nosocomial infection is defined in various methods by authors but all have common elements. The common sites of the infection are urinary, respiratory, and gastro intestinal tract; others are surgical wound, blood, and skin [4].

The common pathogens are bacteria, fungi, and viruses, some of which are highly pathogenic/virulent; others are not (normal flora) expected to be pathogenic/virulent when out of their normal habitats in the body. Transmission to susceptible hosts is by direct or indirect contact [5].

Predisposing factors are broken skin and mucus membranes (wound), immune suppression, extremes of age, many sick patients in one room, breach of infection control practice and procedures, abuse of antibiotics, and invasive procedures [6].

Patients with nosocomial infection are liable to prolonged hospitalization, increased cost, and inconveniences. Nosocomial infection is a global problem and is among the leading causes of death in developed and developing countries [7].

Ward nurses therefore should practice measures to prevent infection spread, hence this research on the knowledge and prevention of nosocomial infection among ward nurses at Federal Medical Centre (FMC).

2. METHODS

2.1. Study Design

The descriptive survey method was used, according to Ige [8], for investigating or researching into something through question and observation in various methods to obtain a solution to the problem under study. The method was selected for its advantages such as orderly collection, easy analysis, interpretation, and report of patient's acts to the subject under study. The study design, the descriptive survey, involves observing and describing the subject's behavior without influencing it.

2.2. Study Population

The study population consists of nurses in medical and surgical wards of FMC, Umuahia.

Table 1: Distribution of population of study.

Wards	Nurses	Percentage
Female medical ward	20	6.56
Male medical ward	20	6.56
Pediatric medical ward	15	4.92
Pediatric surgical ward	16	4.92
Obstetrics/gynecology ward	16	5.25
Private ward	10	2.30
Male surgical ward	13	4.26
Female surgical ward	20	6.55
Female orthopedic ward	20	6.56
Male orthopedic ward	20	6.56
Intensive care unit	15	4.20
Eye ward	13	3.93
New born special care unit	20	6.56
Postnatal ward	20	6.56
Antenatal ward	20	6.56
Community health ward	16	5.25
ENT ward	7	5.25
Labor ward	20	6.56
Total	**305**	**100**

Table 2: Distribution of selected population.

Selected wards	Nurses	Percentage
Female medical ward	20	13.33
Male medical ward	20	13.33
Male surgical ward	20	13.33
Female orthopedic ward	20	13.33
Intensive care unit	15	10
Pediatric surgical ward	15	10
Postnatal ward	20	13.33
Antenatal ward	20	13.33
Total	**150**	**100**

Table 1 shows that a total of 305 nurses in the surgical and medical wards of FMC, Umuahia, was the population under this study.

2.3. Sample/Sampling Technique

The technique used for the study was stratified random sampling. The wards to be studied were selected by simple random sampling. Pieces of paper written "Yes" or "No" with the ward were used to pick the wards to be used, that is, the "Yes." This was performed to provide equal chance for all the population under study. Eight (8) wards with yes were selected for the study.

Table 2 shows that a total of 150 nurses were selected from the eight randomly selected surgical and medical wards.

2.4. Instrument for Data Collection Procedure

Questionnaire was the instrument used for data collection. A list of structured questionnaire in relation to the reviewed literature and stated objectives were used for obtaining data from the subjects. The questionnaires were structured and unstructured.

2.5. Validity/Reliability of the Instrument

The questionnaire was constructed and assessed for content and face validity, and then approved by Michael Okpara University of Agriculture Ethical and Research Committee. Eight copies were provided for pilot study and was later compared and found to be consistent, and the instrument deemed reliable.

2.6. Procedure for Data Collection

The research team visited FMC, Umuahia wards and distributed the questionnaire in person. A total of one hundred and fifty (150) copies of questionnaire were distributed to trained staff nurses in the wards. The filled questionnaires were collected by hand few hours later and on the following day, and the return was 100%.

2.7. Method of Data Analysis

The questionnaire were sorted and edited for completeness. The responses were summed up in tables and charts.

2.8. Ethical Considerations

Permission was taken from the nursing services department and wards. Explanatory note was attached to each questionnaire for respondents. All data gathered were used for academic purpose only. Moreover, the privacy and anonymity of the respondents were maintained.

3. RESULTS

A total of one hundred and fifty (150) questionnaires were distributed, each containing seventeen (17) questions. This represents 100% of the sample population. The data were analyzed, and the results were presented in tables, pies, bar charts, histogram, and percentage.

SECTION A: DEMOGRAPHIC

Table 3: Professional qualifications of respondents.

Qualification	Respondents	Percentage
Registered nurses (RN)	10	6.67
Registered midwives (RM)	–	–
RN/RM	110	73.33
Bachelors' degree (BSc)	30	20
TOTAL	**150**	**100**

Table 4: Status of study population.

Status	Respondents	Percentage
Chief nursing officer (CNO)	27	18
Assistant chief nursing officer (ACNO)	20	13.33
Principal nursing officer (PNO)	20	13.33
Senior nursing officer (SNO)	25	16.6
Nursing officer I (NOI)	28	18.67
Nursing officer II (NOII)	30	20
TOTAL	**150**	**100**

Figure 1: Years of service of studied population.

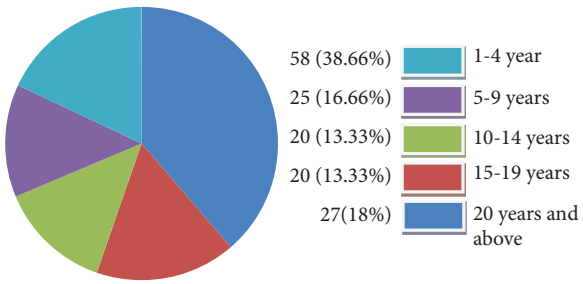


Table 3 shows that the greater percentage of the respondents are those who have RN/RM—110 (73.33%) followed by BSc—30 (20%), RN—10 (6.67%).

Table 4 shows NOII as the highest respondents—30 (20%); NOI—28 (18.67%); CNO—27 (18%); SNO—25 (16.67%); PNO and ACNO—20 (13.33%) each.

The pie chart shows that the respondents who had 1-4 years of service are the highest, that is, 58 (38.66%); 5-9 years—25 (16.66%); 10-14 years—20 (13.33%); 15-19 years—20 (13.33%); 20 years and above—27 (18%).

SECTION B

The bar chart in Figure 3 shows that the majority of the respondents got their information about nosocomial infection from lecturers and seminars—89 (53.33%), followed by reading books—35 (23.33%), through hospital workers 20 (13.33%), and through radio and television—15 (10%).

Table 5 shows that all the respondents know that nosocomial infection is developed during admission in health care facilities–150 (100%).

Table 6 shows that the urinary tract is the commonest site of nosocomial infection and is the highest with 35 respondents (23.33%), followed by surgical wound, respiratory tract, skin 30 (20%) each, and blood 25.

Figure 2: Knowledge of respondent about nosocomial infection before this study.

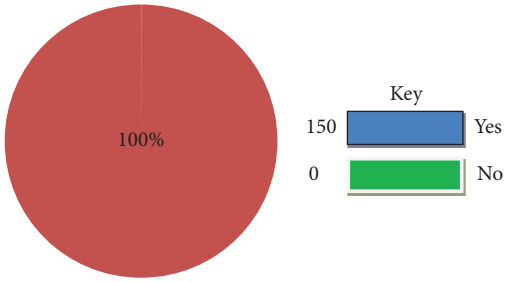


Figure 3: Bar chart shows that all the nurses have heard of nosocomial infection before this study.

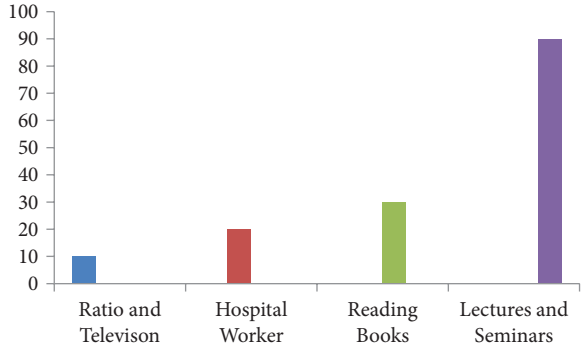


Table 5: Understanding of nosocomial infection.

Understanding	Respondent	Percentage
Developed outside hospital	–	–
Contacted sexually	–	–-
Developed during admission	150	100
No definite cause	–	–
Total	**150**	**100**

Table 6: Commonest site of nosocomial infection.

Site	Respondent	Percentage
Urinary tract	35	23.33
Surgical wound	30	20
Respiratory tract	30	20
Skin	30	20
Blood	25	16.66
Total	**150**	**100**

Figure 4: Pie chart shows that all the respondents are for strict practice of aseptic technique—150 (100%).

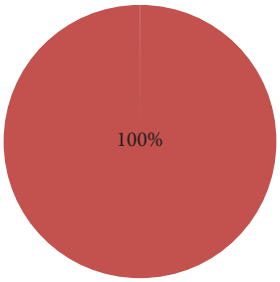
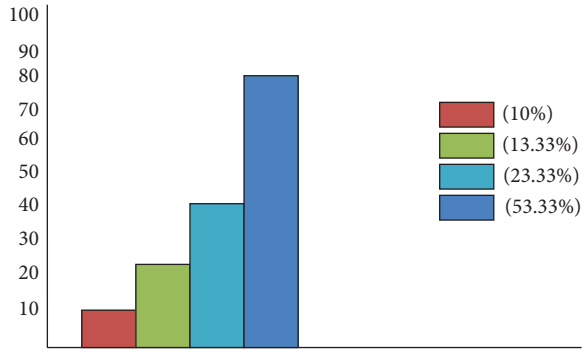


Table 7: Aseptic technique.

Technique	Respondent	Percentage
Use of glove and mask	5	3.33
Use of sterile materials	20	13.33
Avoid wetting of sterile field	5	3.33
Use of clean materials	–	–
Application of a, b, and c	120	80
Total	**150**	**100**

Figure 5: Primary mode of spread for nosocomial infection.



SECTION C: PRACTICE OF ASEPTIC TECHNIQUE

Figure 4: Pie chart shows that all the respondents are for strict practice of aseptic technique—150 (100%).

In Table 7, the respondents with application of a, b, and c are 120 (80%), use of sterile materials—20 (13.33%); use of gloves and mask (3.33%), and use of clean materials—Nil

Table 7 shows the urinary tract as the highest respondent—34 (23.33%), followed by surgical wound and respiratory tract—30 (20%) each; gastrointestinal tract and blood—20 (13.33%) and skin—15 (10%).

Figure 5 shows that all the above with the highest respondents—80 (53.33%), followed by person to person—35 (23.33%), airborne—20 (13.33%), and the lowest urinary tract—15 (10%).

SECTION D: PRACTICE OF BARRIER NURSING

Figure 6 shows that all the respondents who accepted the use of barrier nursing to prevent nosocomial infection—150 (100%) went for Yes and zero response for No.

Table 8 shows that the respondents to all the above option are 120 (80%) and to sterilization of reusable equipment, adequate ventilation, and use of screen are 10 (6.67%).

SECTION E: PRACTICE OF STANDARD PRECAUTION

Table 9 shows that the respondents who agreed with hand washing for 10-15 s are 5 (3.33%), 15-30 s as the highest—80 (53.33%), 30-60 s—15 (33.33%), and 60-120 s—15 (10%).

Figure 6: Barrier nursing acceptance.

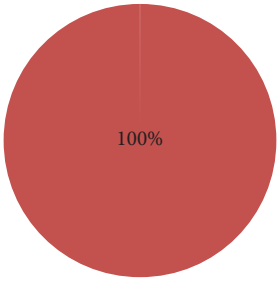


Table 8: Methods of barrier nursing.

Use of screen	10	6.67%
Adequate ventilation	10	6.67%
Sterilization of reusable equipment	10	6.67%
All of the above	120	80%
Total	**150**	**100%**

Table 9: Timing of hand washing.

Time	Respondents	Percentage
10-15 s	5	3.33
15-30 s	80	53.33
30-60 s	15	10
60-120 s	15	10
Total	**150**	**100**

Table 10: Frequency of hand washing.

Frequency	Respondents	Percentage
On arrival at work	5	3.33
In-between patients procedure	50	33.33
After glove removal	15	10
All of the above	80	53.33
Total	**150**	**100**

Table 11: Other standard precaution practices.

Practice	Respondents	Percentage
Use of personal protective equipment	20	13.33
Injection safety practice	35	23.33
Placement of patients	10	6.67
All of the above	75	6.67
Total	**150**	**100**

Table 12: Who should practice standard precaution.

Staff	Respondent	Percentage
Nurses only	10	6.67
Doctors only	10	6.67
All health care providers	120	80
A and B only	10	6.67
Total	**150**	**100**

Table 10 shows that the nurses who wash their hands on arrival at work are 5 (3.33%), in-between patient procedure 50 (33.3%), after glove removal 15 (10%), and after a, b, and c 80 (53.33%).

Table 11 shows that 75 (50%) responded to all the above, followed by 35 (23.33%) for injection safety, 20 (13.33%) for personal protective equipment; 10 (6.67%) for placement of patients and central of patients environment each.

Table 12 shows that 120 (80%) of the respondents agreed to all health care providers should practice standard precaution, while 10 (6.67%) responded to nurses only, doctors only, and nurse and doctors only, each

4. DISCUSSION

On the knowledge of nosocomial infection, Figure 2 shows that all nurses at FMC wards have heard of nosocomial infection. Moreover, in Table 3, it is shown that 100% of the respondents reported that the infection is developed during admission in the health care facilities. In Figure 3, varied indications revealed that 80 (53.33%) obtained the information through lectures and seminars, 35 (23.33%) through hospital workers, and 15 (10%) via radio and television. This agreed with Bello *et al*. [9], a research study on the knowledge and information source among clinical health care students in Ghana. Moreover, it is concluded that students simply demonstrated moderate knowledge of formal classroom training. In addition, it agreed with Oni *et al.* [10], who reported that the decrease in surgical wound site nosocomial infection in surgical wards of University College Hospital Ibadan (UCH) between 1995 and 2004 was traced back to the knowledge gained in the yearly refresher course in surveillance and control of hospital infection, organized by the infection control unit of the Department of Medical Microbiology of the university.

Table 7 shows compliance to aseptic technique by 80% respondents in all forms of invasive procedure and in wound dressing. This agrees with Kleven *et al.* [11] who suggested maintenance of aseptic technique in catheterization and in urological procedures. Saka *et al*. [12] suggested avoidance of catheterization wherever possible and replacement of damp or loosed catheters under strict aseptic technique.

The findings in Table 8 reveal that 80% supported all methods of barrier nursing. This result agreed with Paoulette [13], an article in French, which revealed that the uses of disposal equipment and adequate safety measures have decreased the infection of the respiratory virus, tuberculosis, and incision site resulting from multiresistance bacteria owing to poor hospital sanitation. La Poutreau [7] revealed that nurses have many tools available to create a safe environment that is free of infection. Their full use of barrier principle is of great efficacy in the war against nosocomial infection.

Hand washing as a standard precaution is the most effective control measure against transmission agents. Table 9 shows the timing of hand washing of FMC ward nurses. Exactly 53.33% respondents washed their hands for not less than 15-30 s, which is in good agreement with Blacks [6] who reported that at least 15 s of hand scrub helps to prevent and control infectious agents. In addition, Table 8 shows the frequency of hand washing as follows: 3.33% on arrival to work, 33.33% in between patient's procedure, 10% after glove removal, and 53.33% for the application of all of the above. This agreed with La Poutreau [7] who reported that hand washing is an important component of infection control and isolation precaution, which should be routinely practiced by all ward nurses.

Nursing, with the primary responsibility of providing the best and quality care to the sick and well through evidence-based practice acquired through skill and knowledge, has a vital role to play in the prevention and spread of infection to patients during hospital admission.

Patients should be viewed as people with little or no knowledge of nosocomial infection, and the course of their admission, as predisposing factors.

Every nurse on duty should utilize all the acquired skills and knowledge as a professional toward managing patients and their environment in order to attain maximum reduction of nosocomial infection and its consequences.

The researcher suggests that further studies should be conducted on this topic to identify the contributions of others in the health care field toward prevention of nosocomial infection.

Nursing services department should maintain proper monitoring of the statistics of patients diagnosis on admission, on discharge, and duration in the hospital, as a guide to check nosocomial infection.

As nosocomial infection is acquired through invasive procedures, wound dressing, contagious/infectious diseases, blood, and other body fluid contacts, the standard of aseptic technique should not be compromised; barrier nursing/isolation and standard precaution should not be neglected in the care of our hospitalized patients.

From the findings of this study, the researcher recommends a sensitization seminar and health education on the consequences of nosocomial infection, for staff, and for the entire community. Moreover, nurses should include nosocomial infection issues in their ward report discussion. Nurses should update their knowledge for efficiency in their performance, through the use of research, internet, and nursing journals.

5. CONCLUSION

Nosocomial infection outcome ranges from prolonged hospital stay, increased cost, and discomfort/inconveniences to mortality, if not well managed. It has no limit and can get across to all in contact with hospital environment. This study was conducted to determine the knowledge and prevention of nosocomial infection among ward nurses at FMC, Umuahia. It was found that the nurses have a wealth of knowledge of nosocomial infection but still needed individualized task to the practice as in how and when to practice. Deficiencies were found in the areas of hand washing, mask application, equipment handling, and health education of our patients.

6. LIMITATIONS

The research experienced the following limitations during the study:

(a) Time Factor: Sufficient time was not provided to the researcher to conduct this study.
(b) Schedule of Duty: The ward nurses run shift. Because of the busy tendency of their shift, the researcher had to pass through the shifts and wait till the nurses had time to attend to the researcher.

Author Contributions
This study was conducted with contribution from all the authors. Authors DOO and IU designed the study, wrote the protocol, and supervised the work. Authors AOA, DAO, and IU performed all the laboratory work. Author DAO performed the statistical analysis.

Authors DAO and TAB managed the analyses of the study. Authors AOA, IU, and DAO wrote the first draft of the manuscript.

Authors AOA, DAO, EOO, and IU managed the literature searches, and all authors read, edited, and approved the final draft of the manuscript.

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None.

Conflict of Interest
No conflict of interest is associated with this work.

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