

Factors Influencing Perioperative of Nurse's Compliance with Infections Prevention Guideline in Selected Hospitals, Kogi State

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Abstract

The study utilized a cross-sectional descriptive design to access the Factors Influencing Perioperative of Nurse's Compliance with Infections Prevention Guideline among selected Hospitals in Kogi State, with a sample size of 53 was achieved. An ethical approval and authority to conduct a study was granted. A self-structured questionnaire and observational checklist was used for data collection with reliability index 0.768. The respondents were selected using the purposive sampling technique and data gathered was analyzed using both descriptive and inferential statistics at 0.05 significance level. The study revealed that majority (83%) of the respondents had a good knowledge of compliance and 71.7% of the respondents had good level of compliance. Factors affecting infection prevention include lifestyle habit such as skin bleaching, smoking, alcohol or drug abuse (94.3%), poor operating room ventilation (94.3%), poor

sterilization of instrument (98.1%), immunosuppressant diseases (100%), skin preparation procedure (96.2%), duration of surgery (64.2%) and associated medical conditions (69.8%). This study concludes that the Factors Influencing Perioperative of Nurse's Compliance with Infections Prevention Guideline among selected Hospitals in Kogi State has no influence on their level of compliance, high work load as well as lack of infection control policies and guidelines affects compliance with infection control practice. It is therefore recommended that the need for comprehensive measures to hospital policies that will reinforce compliance with the use of PPE, regular training of perioperative nurses on infection prevention guideline, and employing higher numbers of perioperative nurse in Kogi State Hospital by the hospital management board.

Introduction

Infection is a major problem encountered in health care delivery services worldwide and it constitutes one of the most important causes of morbidity and mortality associated with clinical, diagnostic and therapeutic procedures which leads to the most prevalent adverse event affecting patient safety (Mathenge, 2020). Surgical site infection (SSI) refers to infection that occurs as a result of surgical procedure within thirty days of the surgical procedure or a year (365 days) in some instances (Fatimat *et al*, 2021). According to the Centers for Disease Control and Prevention (CDC) and National Healthcare Surveillance Network, Surgical Site Infections is defined as an infection that occurs within 30 days of surgery or 90 days if an implant is left in place after the procedure (Yuki and Shibamura-Fujiogi, 2021).

The nurses are important member of the surgical care team that stays with the patient round the clock. It is important for the Perioperative nurses to understand the basic of pre and post-operative wound infection prevention and control (Wick, 2018). Surgical units are units for patients who receive medical care after undergoing surgical interventions such as general surgery, orthopedics, Urology, plastic and reconstruction, cardiothoracic, neurosurgical,

laparoscopy intervention and other surgical units (Al-Omari *et al.*, 2020). Nurse's working in the surgical units must be fully aware of the infection control guidelines, due to the seriousness of the cases in those units and their susceptibility to infection (Umscheid *et al.*, 2019).

Perioperative nurses are vital members of the surgical team and are known by various titles, such as scrub nurses, operating theater nurses, circulating nurses, surgical technicians, and operating theater assistants. Their responsibilities begin before surgery, including coordinating the transport of patients to and from the operating theater and wards. They also prepare patients for surgery by reviewing medical records, assessing vital signs, and performing preoperative tasks like washing, shaving, and disinfecting the surgical site (Mathenge, 2020). Perioperative nurses play crucial roles throughout all stages of surgical care, with a significant focus on preventing surgical site infections (SSIs). SSIs are now the most prevalent type of hospital-acquired infection, accounting for 20% of cases, and are also the most expensive, significantly increasing hospitalization costs during admissions (Ellsworth *et al.*, 2023). These nurses are primarily responsible for managing patient care before, during, and after surgery. Their responsibilities include assisting with patient transportation to and from the operating theatre and wards. Additionally, they prepare patients for surgery by reviewing medical records, monitoring vital signs, and performing preoperative tasks such as scrubbing, shaving, and disinfecting the surgical site (Mathenge, 2020).

Hospital-acquired infections (HAIs) represent a significant challenge in patient care, contributing to increased healthcare costs and straining healthcare resources. Health care-associated infections (HCAIs) arise during the provision of medical care and are among the most common adverse events impacting patient safety (WHO, 2020, 2021). Globally, unsafe care is a leading cause of disability and death, responsible for approximately 64 million disability-adjusted life years lost annually. The prevalence of nosocomial infections serves as a critical indicator of healthcare standards, with such infections affecting both developed and developing nations to varying degrees (Emelie, 2019). They increase morbidity among inpatients and outpatients alike, presenting challenges to both individual and community health. Infection prevention and control, therefore, play an essential role in healthcare delivery, employing systematic measures and protocols to minimize the risks posed by HCAIs. These measures aim to create a safe healthcare environment by reducing the

transmission of infectious agents. This research work aims at determining the factors influencing perioperative of nurse's compliance with infections prevention guideline in selected Hospitals, Kogi State.

Materials and Methods

Research Design

A descriptive cross sectional study design was used to assess perioperative nurse's compliance with infection prevention guidelines of surgical site infection in operating theatre at a selected hospital, Kogi State in Nigeria.

Research Setting

This study was conducted among perioperative nurses in a selected hospital of Kogi State. Lokoja is the capital of Kogi State. Kogi State is located in the North-central geopolitical zone of Nigeria. According to Kogi State Ministry of Lands and Survey, Lokoja (2021) the State shares boundaries with 10 of the 36 States including federal capital territory in Nigeria with a population of 4,466,800 people with about 70% of the population living in rural. Kogi is bordered by the states of Nassarawa, Benue, Enugu, Anambra, Delta, Ondo, Ekiti, Kwara, Niger, and Abuja Federal Capital Territory. The people are of different ethnic groups but three major ethnic group with different cultures and languages, which are Ebira, Igala, and Okun being the most prominent tribes (Uguru and Pelumi 2021).

Research Population

The target population of the study involved the entire 54 perioperative nurse in operating theater of three selected hospitals within Kogi State. The list of those hospitals was as follows:

- ✓ Kogi state specialist hospital, Lokoja.
- ✓ Kogi state reference hospital, Okene.
- ✓ Kogi state specialist hospital, Obangede.

Sample Size determination

The sample population for this study was determined using Slovine formula.

The formula applied is given as

$$n = \frac{N}{1 + N(e^2)}$$

Where n = equals sample size required,

N = Total population of perioperative nurses

e = allowable error (0.05)

$n = 54/1 + 54 (0.05^2)$

$n = 54/1 + 54(0.0025)$

$n = 54/1 + 0.135$

$n = 54/1.135$

$n = 47.6$

n is approximated to be 48

Attrition rate = 10% of the sample size

Attrition rate = 10% of 48

Attrition rate = 4.8

Attrition rate approximated = 5

Therefore, sample size = 48+5

The respondents for this study was 53

Sampling technique

This study adopted purposive sampling technique in the selection of respondents (perioperative nurses) across the three selected hospital in Kogi State.

Instrument for data Collection

In this study, two primary sourced instruments were used: Observational checklist and self-structure questionnaire were used to collect data and the tools were basically on infection prevention and control in the theatre on: hand hygiene, use of personnel protective equipment (PPE) and theatre environment control. The use tool was adopted from global guidelines for prevention of surgical site infection developed and published in 2016 and 2018 by Word Health Organization. The questionnaire has a total of forthy eight questions in all and was sub-divided into four sections with observational checklist namely:

Section A: Socio-demographic data.

Section B: Level of knowledgeand compliance of infection prevention and control.

Section C: Compliance to surgical site infections precautions guidelines.

Section D: Factors associated with infection prevention and control compliance among Perioperative Nurse.

Section F: Observational checklist

Method of Data Analysis

The data obtained for this study was analyzed using both descriptive and inferential statistics with the aid of (SPSS) statistical package for social sciences version 26. The retrieved data from questionnaire was inputted into data analysis package to check for error of filling, coded and analyzed and presented using bar charts, and frequency percentage table. The inferential statistics, Pearson Product Moment Correlation (PPMC) and independent T-test was used to test identified hypotheses 1, 2, and 3 at a value of 0.05 level of significant for each statistical test.

Results and Discussion

Table 1: Socio-demographic characteristics of the respondents

Variable	Frequency (N=53)	Percentage (%)
Age (in years)		
24- 30	6	11.3
31 - 40	21	39.6
41 - 50	12	22.6
51 - 59	14	26.4
<i>Mean $\pm$ SD = 43.72$\pm$ 9.95</i>		
Gender		
Male	18	34.0
Female	35	66.0
Marital status		
Single	4	7.5
Married	49	92.5
Present Designation		
NO II	4	7.5
NO I	3	5.7
SNO	12	22.6
PNO	8	15.1
ACNO	2	3.8
CNO	13	24.5
AD	6	11.3
DDN	5	9.4
Duration in Peri-operative		
2-5years	26	49.1
6-10years	13	24.5
11-15years	4	7.5
16years and above	10	18.9
Level of Education		
Diploma	7	13.2
BNSc	39	73.6
MSc	7	13.2
Training on standard infection prevention		
Yes	47	88.7
No	6	11.3

From table 1, the respondents were within ages 24years and 59years with a mean and standard deviation of 43.72 and 9.95 respectively. About two-third (66%) were female while majority (92.5%) were married. This is comparable to a study report by Emelie 2019 study conducted in a selected referral hospital in Rwanda, aimed at assessing compliance with infection control standard precautions in prevention of surgical site infection among theatre staff in operating room which stated that majority of respondents were females comparing to the males and most of them were between age of 31 to 35 years.

Also, majority (88.7%) had training on standard infection prevention (SIP), this findings differs from that study conducted by Mohsen et al., 2020 which shown there was no statistical difference in level of knowledge among nurses who or who did not attend training programme on surgical site infection prevention guidelines. Majority (84.9%) affirmed that surgical site infection occurs within 7-10days after surgery, this is similar to the study above conducted by Mohsen *et al.*, 2020 in a cross sectional descriptive study conducted on 450 nurses from selected Menoufia Governorate Hospitals, Egypt where minority (21.8%) of respondents had poor knowledge about surgical site infection.

Table 2: Knowledge of respondents on Infection Prevention guidelines (n=53)

Variable	Yes	No
Surgical site infection occurs within 7-10 days after surgery.	45 (84.9%)	8 (15.1%)
Aseptic technique reduces surgical site infection.	53 (100.0%)	0 (0.0%)
Surgical dressing should be changed after 24 or 48 hours after surgery.	49 (92.5%)	4 (7.5%)
Poor or incorrect steps of hand washing could result to surgical site infection.	53 (100.0%)	0 (0.0%)
Proper wore of personal protective equipment prevent surgical site infection.	53 (100.0%)	0 (0.0%)
Maintenance of normal nutritional status for surgical patient reduces surgical site infection.	51 (96.2%)	2 (3.8%)
Malnourished patient and relatively healthy person have equal chance of developing surgical site infection	26 (49.1%)	27 (50.9%)
Administration of prophylaxis antibiotics help in preventing surgical site infection	51 (96.2%)	2 (3.8%)
Application of povidone-iodine and normal saline for cleaning surgical site and wound reduces microbes.	53 (100.0%)	0 (0.0%)
Increase in pain, fever and discharge from wound site indicate surgical site infection	51 (96.2%)	2 (3.8%)
The purpose of pre-operative shower is to reduce the risk of surgical site infection	53 (100.0%)	0 (0.0%)

It also shown majority (92.5%) knew that surgical dressing should be changed after 24 or 48hours after surgery while all (100%) agreed that poor or incorrect steps of hand washing could result to surgical site infection and proper use of PPEs prevent surgical site infection. This is in line with findings conducted by Efifie, 2016 in a descriptive cross-sectional study among 125 HCWs working in Kogi State specialist hospital on awareness and adherence to the universal safety precautions with lowest levels of awareness and adherence on use personal protective equipment (PPE), with 46% and 44.6% on adherence respectively and also in contrast with findings from a study conducted by Emelie 2019 in a selected referral hospital in Rwanda focused on 90 operated room staff which reported insufficient compliance on the use of personal protective equipment. However, about half (49.1%) thought that malnourished patient and relatively healthy person have equal chance of developing surgical site infection. This disagreed with findings by Zabaglo *et al.*, 2024, which showed that malnourished patient has a higher chance of developing surgical site infection. Serum protein, white blood cells, and immunoglobulins tend to be low in malnourished patients; hence ability to fight or conquer micro-organism involved in wound sepsis is low, this bring about wound infection (SSI). Majority (83%) of the respondents had a good knowledge, this is in line with findings from a cross sectional study conducted by Adegboye *et al*, in 2018 to evaluate the knowledge and attitude of infection control among health care workers in the Intensive Care Unit (ICU) of Ilorin teaching hospital, the result revealed that respondents had adequate knowledge on effective hand hygiene. The hand is known to be one of the most common carriers of infection transmissions in human.

Table 3: Factors associated with compliance of infection prevention and control

Variable	Yes	No
Several habit such as skin bleaching, smoking, alcohol consumption or drug abuse can leads to surgical site infection.	50 (94.3%)	3 (5.7%)
Poor operating room ventilation	50 (94.3%)	3 (5.7%)
Poor sterilization of instrument and environment cause surgical site infection.	52 (98.1%)	1 (1.9%)
Workload affects your ability to apply infection prevention guidelines	33 (62.3%)	20 (37.7%)
Lack of infection control policies and guidelines in the hospital	29 (54.7%)	24 (45.3%)
Duration of the surgery contributes to surgical site infections.	34 (64.2%)	19 (35.8%)
Immunosuppressant diseases can lead to the cause of surgical site infection.	53 (100.0%)	0 (0.0%)
Medical conditions	37 (69.8%)	16 (30.2%)
Do you feel adequate skin preparation/ cleaning prior to surgery prevents infection?	51 (96.2%)	2 (3.8%)

From table 3. The knowledge of Perioperative nurses on factors affecting wound infection prevention according to respondents include lifestyle habit such as skin bleaching, smoking, alcohol or drug abuse (94.3%), poor operating room ventilation (94.3%), poor sterilization of instrument cause surgical site infection (98.1%), immunosuppressant diseases (100%), skin preparation (96.2%), duration of surgery (64.2%) and co-morbid medical conditions (69.8%). These corroborates the research findings by Zabagloet al., in 2024 which showed that surgical site infections could be attributed to advanced age, malnutrition, hypovolemia, obesity, steroid use, poorly controlled diabetes, immunocompromised state, smoking, trauma, procedure site, extended preoperative hospitalization, inadequate preoperative skin hygiene, and existing infections at distant sites.

However, more than half (62.3%) affirmed that workload as well as lack of infection control policies and guidelines in the hospital (54.7%) affects their ability to apply infection prevention guidelines. This is in tandem with findings from studies conducted in United State by Sagar *et al.*, 2020 in which the compliance was observed to be affected by many factors, such as shortage of staff for a particular procedure or job allocations, heavy workloads, shortages of disinfectant, and intolerance to the hand skin disinfectants.

Also shows that 96.2% each agreed that maintenance of nutritional status for surgical patient and administration of prophylactic antibiotics reduces surgical site infection while all (100%) respondents agreed that application of povidone-iodine as well as normal saline for cleaning surgical site and wound reduces microbe and the purpose of pre-operative shower is to reduce the risk of infection, this is in line with findings from a systematic study conducted by Sagar, *et al.* 2020 while comparison between the efficiency of surgical hand washing method and the antiseptics of choice where majority of the respondents preferred alcohol based washing and scrubbing with a antiseptic soap or a povidone iodine products.

Findings from this study revealed that there is a good compliance to hand hygiene among respondents as all (100%) always remove jewelry, artificial nail and nail polish before starting hand hygiene. This is in accordance to W.H.O where majority (90.6%) always wash hand with soap and water on arrival to operating room but in contract to a study by Emelie 2019 conducted in a selected referral hospital in Rwanda, aimed at assessing compliance with infection control standard precautions in prevention of surgical site infection among

theatre staff in operating room which revealed an insufficient compliance with standards precautions regarding hand hygiene especially on removing artificial nail and nail polish before starting surgical hand decontamination (57.8%), hand washing with soap and water on arrival to operating room respecting WHO techniques observed were only 5 respondents (5.6) and also only 54 respondents (60%) respecting 2-5 min the required time for scrubbing were observed before donning sterile gloves (Emelie 2019).

Conclusion

The following conclusion was made on factors influencing perioperative of nurses compliance with infections prevention guideline in selected Hospitals, Kogi State, Participants have good level of knowledge on infection prevention guidelines, their socio-demographic characteristics has no influence on their level of knowledge. The level of knowledge has no significant influence on their level of compliance. High workload as well as lack of infection control policies and guidelines are mostly factors that affects compliance with infection control practice.

Recommendation

World health organisation (WHO) recommendations guideline on surgical infection prevention by all health workers especially members of the surgical team should be enforced and also Proper screening of all patients and handling all patients as infectious until proven otherwise; Nurses should stay informed about current infection prevention guidelines and recommendations from health authorities, such as the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO).

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