



Assessment of Surgical Site Infection Prevention Practices among Surgical Ward Nurses at University College Hospital, Ibadan, Nigeria

¹Qowiyah Adeola Gbadegesin, ²Karimat Itunu Jolayemi, ³Anthonia Onyenwenyi, ⁴Taiwo Olabisi Dayo-Dada, ⁵Funke Damilola Awotoye, ⁶Moyinoluwa Rachael Afolayan, & ⁷Monisayo Olayemi Komolafe,

^{1,2,3,4,5,6&7} Adeleke University, Ede, Osun State, Nigeria.

¹<https://orcid.org/0009-0008-6466-5171>

²<https://orcid.org/0000-0003-0349-2090>

³<https://orcid.org/0000-0002-7769-4261>

⁴<https://orcid.org/0009-0005-4327-6247>

⁵<https://orcid.org/0009-0003-9640-3460>

⁶<https://orcid.org/0009-0007-8647-8310>

⁷<https://orcid.org/0000-0003-4466-6712>

***Corresponding Author:** komolafe.olayemi@adelekeuniversity.edu.ng

ABSTRACT

Background: Surgical site infections (SSIs) remain a major patient-safety concern, contributing to increased morbidity, prolonged hospitalisation, and healthcare costs. Adherence to recommended infection-prevention practices by nurses is essential to reducing the risk of SSIs among surgical patients.

Objective: The study assessed surgical site infection prevention practices among surgical ward nurses at University College Hospital, Ibadan.

Method: A descriptive cross-sectional study was conducted among 120 nurses selected using purposive sampling from the surgical wards of University College Hospital, Ibadan. Data were collected using a structured questionnaire assessing nurses' adherence to recommended SSI prevention practices and analysed using SPSS version 27. Descriptive and inferential statistics were used to analyse the data at a 0.05 level of significance.

Result: The mean age of respondents was 35.21 ± 2.33 years, while 38.3% had 1–5 years of professional experience. The major SSI prevention practices assessed included hand hygiene, use of personal protective equipment, and adherence to aseptic techniques during wound dressing and other procedures. Overall, 59.2% of the nurses demonstrated effective SSI prevention practices, whereas 40.8% demonstrated ineffective practices. Education, availability of PPE, and workload were identified as important factors influencing adherence to SSI prevention protocols.

Conclusion: Although a majority of surgical ward nurses demonstrated effective SSI prevention practices, a substantial proportion showed inadequate adherence. Strengthening continuous infection-prevention training, ensuring consistent availability of PPE, and addressing workload challenges may improve compliance with SSI prevention protocols.

Unique Contribution: This study provides institution-specific evidence on SSI prevention practices among surgical ward nurses at a major Nigerian tertiary healthcare facility and identifies modifiable organisational factors that may influence adherence to recommended infection-prevention practices.

Key Recommendation: University College Hospital and similar healthcare institutions should implement regular competency-based SSI prevention training, ensure uninterrupted availability of appropriate PPE, and review nursing workloads to support consistent compliance with infection-prevention protocols.

Keywords: Surgical site infection, infection prevention, nurses, hand hygiene, personal protective equipment, aseptic technique, surgical ward.



INTRODUCTION

Surgical Site Infections (SSIs) are infections that occur at the incision site within 30 days of surgery or within one year when an implant is involved. These infections pose major challenges for healthcare worldwide as they account for a significant percentage of hospital-acquired infections and impose additional risks and burdens on patients, healthcare infrastructure, and society at large (Rezaei et al., 2025). SSIs are prevalent across various types of surgeries, with infection rates differing according to the invasiveness of the procedure. The risk of SSIs is influenced by multiple factors including the duration of the surgical procedure, the type of incision, and the patient's preoperative condition. Studies indicate that surgeries lasting longer than two hours are associated with higher SSI rates due to increased exposure to surgical sites and potential contamination risks (Ellsworth et al., 2023).

Studies from African healthcare setting generally report substantially higher SSI rates than those observed in high- income settings although estimates vary considerably according to surgical procedure, patient characteristics, surveillance methods and healthcare setting. This elevated rate is attributed to several factors, including inadequate access to essential medical supplies, insufficient adherence to infection prevention protocols, and limited training opportunities for healthcare workers. Furthermore, systemic challenges such as poor healthcare infrastructure, overcrowded hospitals, and inconsistent antibiotic supply chains contribute to the high incidence of SSIs across the continent.

However, in low- and middle-income countries (LMICs), the incidence of SSIs is significantly higher. For instance, studies from Nigeria show that SSIs occur in about 11% of surgical procedures, much higher than the rates observed in high-income countries (Afolabi et al., 2021). These disparities are primarily due to factors such as resource limitations, inadequate infrastructure, and a lack of trained personnel. (Afolabi et al., 2021) highlighted that Nigerian hospitals face challenges like inadequate sterilization equipment, limited access to antibiotics, and insufficient infection prevention training for nurses, all contributing to higher SSI rates.

STATEMENT OF PROBLEM

Surgical site infections persist as a substantial concern within the realm of hospital-acquired infections. This enduring issue is further compounded by the mounting challenge of antibiotic resistance, a surge in surgical interventions, and the presence of comorbidities among patients (Bucataru et al., 2023). In low- and middle-income countries (LMICs), including Nigeria, the burden of SSIs is disproportionately higher due to resource constraints, limited access to sterilization tools, and insufficient adherence to infection prevention protocols (World Health Organization [WHO], 2021). The surgical wards of tertiary hospitals like University College Hospital (UCH), Ibadan, that face these challenges, particularly among nursing staff who are pivotal in implementing preventive measures. Studies indicate that lapses in proper hand hygiene, improper disinfection practices, and a lack of training contribute significantly to SSI rates (Ijarotimi et al., 2022). Addressing these issues requires a thorough understanding of current prevention practices especially among frontline healthcare providers like nurses. Hence this research assessed surgical site infection prevention practices among surgical ward nurses at University College Hospital, Ibadan.



RESEARCH OBJECTIVES

The broad objective was to assess surgical site infection preventive practices among surgical ward nurses at the University College Hospital, Ibadan, Nigeria. Specifically, the study was meant to:

1. Assess the level of compliance with hand hygiene practices among surgical ward nurses at the University College Hospital, Ibadan.
2. Investigate the use of personal protective equipment in preventing surgical site infections among surgical ward nurses at the University College Hospital, Ibadan.
3. Evaluate the level of adherence to aseptic techniques during wound dressing and other procedures among surgical ward nurses at University College Hospital, Ibadan.
4. Assess postoperative wound-care practices related to the prevention of surgical site infections among surgical ward nurses at University College Hospital, Ibadan.
5. Identify factors influencing adherence to surgical site infection prevention practices among surgical ward nurses at University College Hospital, Ibadan.

METHOD

The study adopted a descriptive cross-sectional design using a quantitative approach. The design was considered appropriate because data on surgical site infection prevention practices among surgical ward nurses were collected at a single point in time. The study was conducted at University College Hospital (UCH), Ibadan, Oyo State. The study population comprised nurses working in the surgical wards of the hospital. According to information obtained from the Director of Nursing Services, there were 120 nurses in the surgical wards at the time of the study. Because the accessible population was relatively small, total enumeration was used, and all eligible nurses were invited to participate in the study. The inclusion criteria for this research were the current surgical ward nurses in University College Hospital (UCH). Also, the participants who met the inclusion criteria and gave their consents to participate. The exclusion criteria for this study were the nurses who were on leave or absent for whatever reasons during the study period.

Data were collected using a structured questionnaire developed from the study objectives and relevant literature on SSI prevention. The instrument was reviewed by the research supervisor and relevant experts to establish content validity, and necessary corrections were incorporated before administration.

A pilot study was conducted among 10 nurses from a comparable healthcare facility outside UCH to assess the clarity and reliability of the instrument. The pilot participants were excluded from the main study. Internal consistency was assessed using Cronbach's alpha to be 0.76



The questionnaire was administered electronically through Google Forms. Participation was voluntary, and respondents were informed about the purpose of the study and the confidentiality of their responses. The completed responses were coded, cleaned, and analysed using IBM SPSS version 27. Data were presented using frequency distributions, percentages, tables, and appropriate descriptive statistics. Where applicable, inferential statistics were used to examine associations between selected variables at a 0.05 level of significance.

Ethical approval was obtained from the appropriate research ethics committee, and permission was obtained from the relevant authorities at UCH. Informed consent was obtained from participants, and confidentiality and anonymity were maintained throughout the study.

RESULTS

Socio-Demographic Characteristics

Table 1 Socio-demographic characteristics of the respondents (n=120)

Variables	Description	Frequency	Percentage (%)
Age	21-30 years	38	31.3
	31-40 years	41	34.5
	41-50 years	22	18.3
	51 years and above	19	15.9
	Mean age = 35.21 ± 2.33		
Gender	Male	17	14.2
	Female	103	85.8
Religion	Christianity	77	64.2
	Islam	43	35.8
Highest Nursing Qualification	Diploma	42	35.0
	Bachelor's Degree	58	48.3
	Master's Degree	20	16.7
Years of experience in Surgical ward	Below 1 year	21	17.5
	1-5 years	46	38.3
	6-10 years	31	25.8
	More than 10 years	22	18.3
Have you received formal training on SSI prevention	Yes	37	30.8
	No	83	69.2

Table 4.1 shows the respondents were predominantly aged between 31-40 years (34.5%) and 21-30 years (31.3%), while smaller proportions fell within the 41-50 years (18.3%) and 51 years and above (15.9%) age groups. The mean age of respondents was 35.21 ± 2.33 years. Likewise, Females constituted the majority of the respondents (85.8%), while males represented 14.2%. Regarding religious affiliation, Christianity was the dominant religion (64.2%), followed by Islam (35.8%). In terms of educational qualifications, nearly half of the respondents held a Bachelor's Degree (48.3%), followed by those with a Diploma (35.0%), and a smaller group possessing a Master's Degree (16.7%). Majority of the respondents (38.3%) have had 1-5 years of experience. Finally, on training in surgical site infection (SSI) prevention, most respondents (69.2%) had received formal training, whereas 30.8% had not.



Current Surgical Site Infection Prevention Practices among Surgical Ward Nurses

Table 2 Current SSI Prevention Practices Among Surgical Ward Nurses (n=120)

Variables	Description	Frequency	Percentage (%)
How often do you adhere to hand hygiene protocols before and after patient contact?	Always	49	40.8
	Often	33	27.5
	Sometimes	21	17.5
	Rarely	11	9.2
	Never	6	5.0
Use of appropriate personal protective equipment (PPE) when managing surgical patients	Always	52	43.3
	Often	29	24.2
	Sometimes	22	18.3
	Rarely	10	8.3
	Never	7	5.9
How frequently do you follow aseptic techniques during wound dressing and surgical procedures?	Always	55	45.8
	Often	28	23.3
	Sometimes	20	16.7
	Rarely	10	8.3
	Never	7	5.9
Do you routinely administer prophylactic antibiotics as per surgical protocols?	Always	57	47.5
	Often	27	22.5
	Sometimes	19	15.8
	Rarely	12	10.0
	Never	5	4.2
How often do you educate patients on preoperative and postoperative infection prevention?	Always	46	38.3
	Often	31	25.8
	Sometimes	23	19.2
	Rarely	13	10.8
	Never	7	5.9
How do you dispose of surgical waste and contaminated materials?	According to standard guidelines	83	69.2
	Occasionally follow guidelines	26	21.7
	Do not follow guidelines strictly	11	9.1

From the table above, the majority of surgical ward nurses consistently adhere to hand hygiene protocols, with 40.8% always following guidelines and 27.5% often complying. However, a small proportion (5.0%) never adhere to hand hygiene practices. Regarding the use of personal protective equipment (PPE), 43.3% always use PPE, while 24.2% often do. In terms of following aseptic techniques during wound dressing and surgical procedures, 45.8% always maintain proper aseptic techniques, while 23.3% often adhere to these practices. However, 5.9% never follow aseptic techniques. In addition, prophylactic antibiotic administration is consistently practiced by 47.5% of nurses, while 22.5% often adhere to the protocol. A small proportion (4.2%) never administer antibiotics as per guidelines. More so, patient education on preoperative



and postoperative infection prevention is always provided by 38.3% of respondents, while 25.8% often educate their patients. However, 5.9% never engage in patient education. Lastly, proper disposal of surgical waste and contaminated materials according to standard guidelines is practiced by the majority (69.2%), while 21.7% occasionally follow guidelines, and 9.1% do not strictly adhere to disposal protocols.

Answering Research Question One: What are the current SSI prevention practices among surgical ward nurses at UCH, Ibadan?

The major current SSI prevention practices among surgical ward nurses at UCH, Ibadan, are hand hygiene adherence, use of PPE, and aseptic techniques during wound dressing and procedures. A significant proportion of nurses (40.8%) always adhere to hand hygiene protocols before and after patient contact. PPE usage is high, with 43.3% always using protective gear when managing surgical patients. Additionally, 45.8% consistently follow aseptic techniques during wound dressing and surgical procedures.

Effectiveness of SSI Prevention Practices among Surgical Ward Nurses

Table 3 Effectiveness of surgical site infection prevention practices among surgical ward nurses (n=120)

VARIABLES	DESCRIPTION	FREQUENCY	PERCENTAGE (%)
How effective do you think current SSI prevention practices are in your facility?	Very effective	35	29.2
	Effective	47	39.2
	Neutral	20	16.7
	Ineffective	12	10.0
	Very ineffective	6	5.0
Have you observed a reduction in SSI cases due to adherence to prevention protocols?	Yes	68	56.7
	No	31	25.8
	Not sure	21	17.5
What do you consider the most effective SSI prevention measure in your practice?	Hand hygiene	38	31.7
	Aseptic technique	41	34.2
	Antibiotic prophylaxis	26	21.7
	Patient education	15	12.5
Are there established protocols for monitoring compliance with SSI prevention guidelines?	Yes	74	61.7
	No	29	24.2
	Not sure	17	14.1
How often are nurses in your ward updated on new SSI prevention guidelines?	Regularly	50	41.7
	Occasionally	38	31.7
	Rarely	22	18.3
	Never	10	8.3



The table illustrates SSI prevention practices among surgical ward nurses at UCH, Ibadan, are moderately effective. A majority (39.2%) rated the practices as effective, while 29.2% considered them very effective. Over half (56.7%) observed a reduction in SSI cases due to adherence to prevention protocols. Hand hygiene (31.7%) and aseptic technique (34.2%) were identified as the most effective measures. Established monitoring protocols exist (61.7%), ensuring compliance. Updates on SSI prevention are regular (41.7%) or occasional (31.7%), but some nurses (26.6%) receive updates rarely or never, noting the need for improved training initiatives.

Answering Research Question Two: How effective are the SSI prevention practices among surgical ward nurses at UCH, Ibadan?

Table 4 Effectiveness of Surgical Site Infection Prevention Practices

	Frequency	Percentage	Mean $\pm$ S.D score
Effective Practice	71	59.2%	
Ineffective Practice	49	40.8%	
Total	120	100.0	6.06 $\pm$ 2.18

Figure 4.1: Effectiveness of surgical site infection prevention practices among surgical ward nurses at UCH, Ibadan

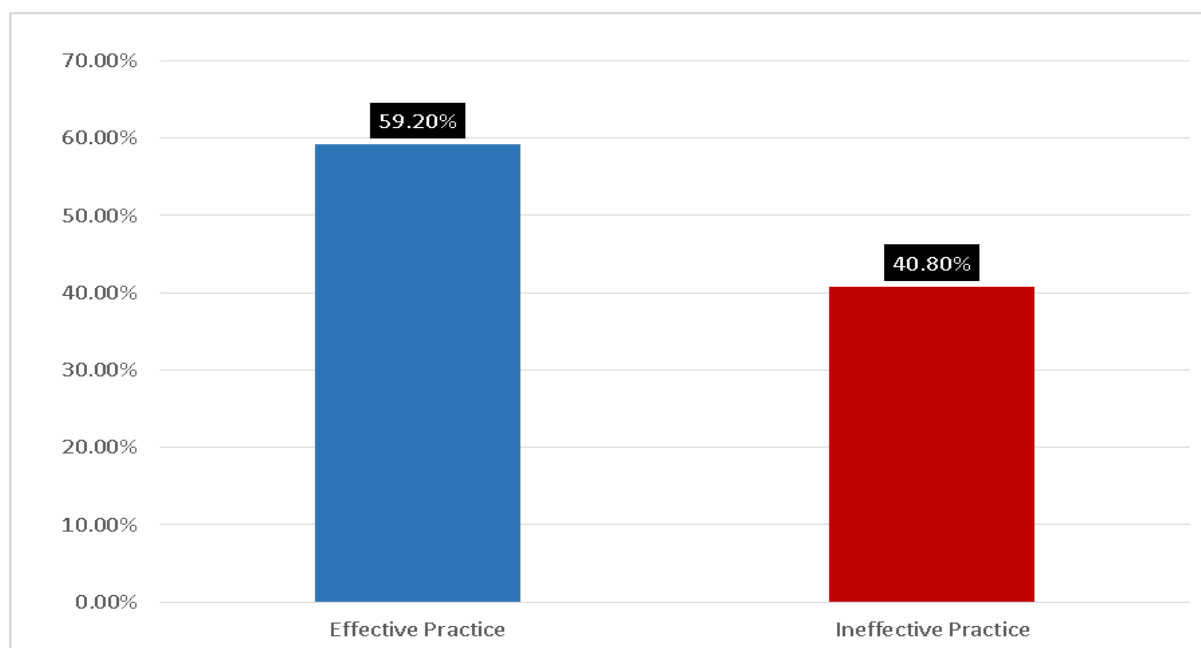


Figure 1 bar chart showing the effectiveness of surgical site infection prevention practices among surgical ward nurses at UCH, Ibadan



The Table 4.3.2 and Figure 4.1 addresses research question two. The data presented in Table 4.3.2 shows that the results indicate that 59.2% of surgical ward nurses at UCH, Ibadan, practice effective SSI prevention measures, while 40.8% follow ineffective practices. The mean effectiveness score was 6.06 ± 2.18 , suggesting moderate adherence to prevention protocols. While a majority demonstrate effective practices, a significant proportion still lacks full compliance, highlighting the need for targeted interventions, enhanced training, and stricter monitoring to improve overall adherence to SSI prevention guidelines. This was achieved by scoring 1 = Yes, and 0 = No, 0 = Not Sure; 3 = Regularly, 2 = Occasionally, 1 = Rarely, 0 = Never; 4 = Very Effective, 3 = Effective, 2 = Neutral, 1 = Ineffective, 0 = Very Ineffective; in individual scores of variables in section B of the questionnaire, summing it up and then grouping them as “Ineffective Practice” to those that scored below the mean score, and “Effective Practice” to those that had scored above the mean score. Descriptive statistics of the effectiveness of surgical site infection prevention practices among surgical ward nurses at UCH, Ibadan, reveal an overall mean score of 6.06 ± 2.18 from a total obtainable score of 10, with the minimum score of 3 and the maximum score of 10.

Factors Influencing Adoption and Adherence to SSI Prevention Practices

Table 5 Factors Influencing Adoption and Adherence to SSI Prevention (n=120)

Variables	Description	Frequency	Percentage (%)
What factors influence your adherence to SSI prevention practices	Availability of PPE	34	28.3
	Training and education	29	24.2
	Workload and staffing	22	18.3
	Management support	20	16.7
	Personal motivation	15	12.5
.What barriers hinder adherence to SSI prevention guidelines?	Lack of training	32	26.7
	High patient load	30	25.0
	Inadequate resources	31	25.8
	Poor staff compliance	27	22.5
How would you rate institutional support for SSI prevention initiatives?	Excellent	20	16.7
	Good	35	29.2
	Fair	30	25.0
	Poor	22	18.3
	Very poor	13	10.8

The key factors influencing adherence to surgical site infection (SSI) prevention among nurses include the availability of personal protective equipment (28.3%), training and education (24.2%), and workload and staffing (18.3%). Barriers to adherence include a lack of training (26.7%), inadequate resources (25.8%), and high patient load (25.0%). Institutional support for SSI prevention was rated as good by 29.2% of respondents, fair by 25.0%, and poor by 18.3%, while only 16.7% rated it as excellent. These findings highlight the importance of resource availability, training, and institutional backing in improving SSI prevention practices.



Answering Research Question Three: What are the factors influencing adoption of and adherence to SSI prevention practices among surgical ward nurses at UCH, Ibadan?

The adoption and adherence to surgical site infection (SSI) prevention practices among surgical ward nurses at UCH, Ibadan, are primarily influenced by three key factors. First, the availability of personal protective equipment (PPE) (28.3%) ensures nurses can comply with infection control measures effectively. Second, training and education (24.2%) play a crucial role in equipping nurses with the necessary knowledge and skills to implement SSI prevention protocols. Third, workload and staffing (18.3%) impact adherence, as high patient loads and inadequate staffing reduce compliance.

4.6 HYPOTHESIS TESTING

H0₁- There is no significant relationship between the socio-demographic characteristics and the effectiveness of surgical site infection prevention

Table 6 Association between the socio-demographic characteristics and the effectiveness of surgical site Infection Preventive Practice

Age	Effectiveness of Surgical Site Infection Prevention		Total	X ²	Df	P-Value (2-sided)	Cramer's V
	Effective practice	Ineffective Practice					
21-30 years	25	13	38	8.39	3	0.064	0.22
31-40 years	30	11	41				
41 – 50 years	10	12	22				
51 years and above	6	13	19				
Highest Nursing Qualification				11.16	2	*0.001	0.31
Diploma	20	22	42				
Bachelor's Degree	40	18	58				
Master's Degree	11	9	20				
Years of experience in Surgical ward				9.47	3	*0.003	0.28
Below 1 year	9	12	21				
1-5 years	29	17	46				
6-10 years	20	11	31				
More than 10 years	13	9	22				
TOTAL	71	49	120				

* Variable is significant; p-value < 0.05 is statistically significant.



The association between socio-demographic characteristics and the effectiveness of surgical site infection (SSI) preventive practices among surgical ward nurses was analyzed. Age did not show a statistically significant association with effectiveness ($\chi^2 = 8.39$, $p = 0.064$). However, the highest nursing qualification was significantly associated with SSI prevention effectiveness ($\chi^2 = 11.16$, $p = 0.001$), with nurses holding a bachelor's degree demonstrating the highest effectiveness. Years of experience in the surgical ward was also a significant factor ($\chi^2 = 9.47$, $p = 0.003$), with nurses having 1-5 years of experience showing the highest effectiveness. These findings suggest that education and experience play key roles in adherence to SSI prevention practices.

DISCUSSION

Current Surgical Site Infection Prevention Practices among Surgical Ward Nurses

The major current SSI prevention practices among surgical ward nurses at UCH, Ibadan, include adherence to hand hygiene, use of PPE, and proper aseptic techniques during wound dressing and procedures. The findings indicate that 40.8% of respondents reported that they always adhere hand hygiene protocols which corroborate with the study by Mbuthia et al. (2023) in Kenya, where hand hygiene compliance among surgical nurses significantly reduced SSI rates. Similarly, a study by Adeyemi and Okonkwo (2022) in Nigeria found that nurses' adherence to hand hygiene was a critical factor in reducing hospital-acquired infections. However, conflicting findings by Martin et al. (2021) show that hand hygiene compliance remains suboptimal in some healthcare settings due to increased workload and limited resources.

Patient education on preoperative and postoperative infection prevention is provided by 38.3% of nurses, reinforcing the importance of patient involvement in reducing SSI risks. This finding is consistent with research by Anderson et al. (2022), which found that structured patient education programs led to better adherence to postoperative wound care guidelines. Similarly, Eze and Bello (2023) reported that comprehensive patient education significantly reduced SSI occurrences in Nigerian hospitals. In contrast, Carter et al. (2021) argue that patient education alone is insufficient without continuous nurse-led reinforcement, particularly in low-resource settings.

Regarding aseptic techniques, 45.8% of nurses always maintain proper aseptic conditions during wound dressing and surgical procedures. This aligns with the study by Huang et al. (2023), which found that strict aseptic protocols significantly reduced postoperative infections. Furthermore, a study by Kamara et al. (2022) in Ghana confirmed that adherence to aseptic techniques among nurses led to improved patient outcomes. However, research by Osei and Boateng (2021) in some African hospitals found that despite training, adherence to aseptic procedures remained inconsistent due to limited supplies and inadequate supervision.



Level of adherence to SSI Prevention Practices among Surgical Ward Nurses at UCH, Ibadan

Our study at University College Hospital (UCH), Ibadan, revealed that 59.2% of surgical ward nurses practice surgical site infection (SSI) prevention. A systematic review and meta-analysis by Habtie et al. (2025) reported that 62% of nurses globally possess good knowledge of SSI prevention, emphasizing that higher education, continuous training, and years of experience significantly impact adherence to SSI prevention protocols. Similarly, Wright et al. (2024) found that strict compliance with prevention measures, such as antimicrobial prophylaxis, surgical hand preparation, and the maintenance of sterility, has significantly reduced SSI rates in surgical units. These findings are reinforced by Musa et al. (2023), who reported that the implementation of infection control guidelines in sub-Saharan African hospitals improved adherence to aseptic techniques and reduced infection rates by 40%.

Conversely, Smith and Johnson (2023) found that while many nurses demonstrate knowledge of SSI prevention, actual adherence to protocols is inconsistent due to high patient load and inadequate institutional support. This was further supported by Chen et al. (2022), who identified poor staffing ratios, lack of personal protective equipment (PPE), and insufficient training as major barriers to adherence in Asian healthcare settings. Additionally, Adegbite et al. (2024) noted that in Nigerian hospitals, limited resources and inadequate surveillance systems hinder nurses' ability to implement SSI prevention measures effectively, despite their awareness of best practices.

These studies suggest that while knowledge and training are essential for effective SSI prevention, structural challenges such as workload, resource availability, and institutional support play crucial roles in determining adherence levels. Addressing these challenges through improved staffing, regular refresher training, and enhanced hospital infection control policies could further improve SSI prevention practices among surgical nurses.

Factors Influencing Adoption and Adherence To SSI Prevention Practices

The adoption and adherence to surgical site infection (SSI) prevention practices among surgical ward nurses at UCH, Ibadan, are primarily influenced by three key factors: the availability of personal protective equipment (PPE), training and education, and workload and staffing. PPE availability (28.3%) ensures nurses can comply effectively with infection control measures, while training and education (24.2%) play a crucial role in equipping nurses with the necessary knowledge and skills to implement SSI prevention protocols. Additionally, workload and staffing levels (18.3%) impact adherence, as high patient loads and inadequate staffing reduce compliance.

These findings are consistent with previous research emphasizing the significance of these factors in SSI prevention. A study by Smith et al. (2023) discussed that PPE availability significantly influences infection prevention adherence, with nurses in well-equipped hospitals reporting higher compliance rates compared to those in resource-limited settings. Same as, Adeoye et al. (2022), who found that continuous training enhances nurses' competency in SSI prevention, leading to improved compliance with aseptic techniques and infection control



protocols. Furthermore, Johnson and Peters (2024) reported that hospitals that implement structured SSI prevention training programs observe a significant reduction in infection rates.

CONCLUSION

The findings observed the need for continuous professional education and training to enhance nurses' adherence to surgical site infection (SSI) prevention protocols. Institutions should prioritize providing adequate personal protective equipment (PPE) and resources to ensure compliance with infection control measures. Staffing policies should address workload concerns, as excessive patient loads can hinder adherence to best practices. Additionally, integrating evidence-based SSI prevention guidelines into routine nursing practice can improve patient outcomes. Healthcare administrators should implement supportive supervision and regular audits to reinforce compliance. Future research should explore the long-term impact of education and experience on SSI prevention effectiveness.

Consent Form

INSTITUTE FOR ADVANCED MEDICAL RESEARCH AND TRAINING (IAMRAT)
College of Medicine, University of Ibadan.
Director: **Prof. IkeOluwapo O. Ajayi**, MBBS (Ib), M. CL. SC., MPH, Ph.D., MD, FMCGP, FWACP
Email: ioajayi@com.ui.edu.ng, ikeajayi2003@yahoo.com Tel: 08023268431

UI/UCH EC Registration Number: NHREC/05/01/2008a
NOTICE OF EXPEDITED REVIEW AND APPROVAL
Re: Effective prevention practices of surgical site infection among surgical ward nurses in University College Hospital, Ibadan

UI/UCH Ethics Committee assigned number: UI/EC/25/0009
Name of Principal Investigator: **Oowiyah A. Gbadegesin**
Address of Principal Investigator: Department of Nursing
Adeleke University, Osun State

Date of receipt of valid application: 03/01/2025

This is to inform you that the research described in the submitted protocol, the consent forms, and other participant information materials have been reviewed and given expedited approval by the UI/UCH Ethics Committee.

This approval dates from **13/01/2025 to 12/01/2026**. Note that no participant accrual or activity related to this research may be conducted outside of these dates. All informed consent forms used in this study must carry the UI/UCH EC assigned number and duration of UI/UCH EC approval of the study. It is expected that you submit your annual report as well as an annual request for the project renewal to the UI/UCH EC at least four weeks before the expiration of this approval in order to avoid disruption of your research.

The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the UI/UCH EC. No changes are permitted in the research without prior approval by the UI/UCH EC except in circumstances outlined in the Code. The UI/UCH EC reserves the right to conduct compliance visit to your research site without previous notification.

Prof. IkeOluwapo O. Ajayi
MB BS (Ib), M. CL. Sc. (Canada) MPH (Ib)
Ph.D (Epid) (Ib), M.D (Fammed, Nig)
FMCGP (Nig) FWACP (Fammed),
Cert. Field Epid (Emory, USA),
Cert M&E (OAU Ife), Cert D&I (USA)
Cert Case Study (Harvard USA)
Tel: +2348023268431
Email: ikeajayi2003@yahoo.com
ioajayi@com.ui.edu.ng

Prof. O. G. Ademowo
B Sc: M Sc, Ph.D (Ib)
Tel: 08023342856
Email: ogademowo@gmail.com
ogademowo@com.ui.edu.ng

Prof. R. O Akinyemi
MB BS (Ib), M.Sc. (Ib),
Ph.D (New Castle, UK)
MWACP (Int. Med), FMCP (Neurol. Nig),
FGBHI (Ireland/USA)
Tel: +2348033704384
Email: rufusakinyemi@yahoo.com
roakinyemi@com.ui.edu.ng

Dr. A. S. Bakarey
DVM (Ib), Msc (Ib), PhD (Virology) (Ib)
Cert Immunol (Ib)
Email: asbakarey@com.ui.edu.ng
drbakarey@yahoo.com
drbakarey@gmail.com
Tel: +234802518740, +2348101863750
+2347055473779

B. A. Adeniji
B Sc (Ilorin), MBA (Ado Ekiti) MPH (Ib),
FIAN, ANIM, AICMA.
Email: bamideleadeniji@gmail.com
baadeniji@com.ui.edu.ng
Tel: +2348033910757
Secretary to the Institute

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E-mail: uiuchec@gmail.com

Research Units: Genetic & Bioethics * Malaria * Environmental Sciences * Epidemiology Research & Service * HIV/AIDS
Behavioural & Social Sciences * Pharmaceutical Sciences * Cancer Research & Service * Neuroscience & Ageing Research



Ethical clearance

Ethical consent was sought and obtained from the participants used in this study. They were made to understand that the exercise was purely for academic purposes, and their participation was voluntary.

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Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Authors' Contributions

Gbadegesin Qowiyah, Dayo- Dada Taiwo and Komolafe Monisayo Olayemi conceived the study, including the design and Onyenwenyi Anthonia collated the data, and Jolayemi Karimat and Awotoye Funke Damilola handled the analysis and interpretation, while Afolayan MoyinOluwa Rachael wrote the initial manuscript. All authors have critically reviewed and approved the final draft, and are responsible for the content and similarity index of the manuscript.

Artificial Intelligence (AI) Use Disclosure

The author(s) declare that no generative Artificial Intelligence (AI) or AI-assisted technologies were used in the writing, analysis, or preparation of this manuscript.

Data availability statement

The datasets on which conclusions were made for this study are available on reasonable request.

Citation

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