



BARRIERS TO THE PREVENTION OF POST-OPERATIVE INFECTION AMONG NURSES AT VOM CHRISTIAN HOSPITAL (VCH), JOS SOUTH LOCAL GOVERNMENT AREA, PLATEAU STATE

Bulus Jericho Ali¹, Goyit Samson Stephen¹, Ogundiran John¹, Bobi Nuhu Ezekie¹, Grace Ifeyinwa Onyejekwe^{1,2}, Asheshen Plangnan Christopher¹, Aibangbee Esther³

1. Department of Nursing Science, Plateau State University, Bokkos, Plateau State, Nigeria.
2. Department of Nursing Science. University of Jos. Plateau State.
3. Our Lady of Apostles College of Nursing Sciences, Jos, Plateau State, Nigeria.

Corresponding Author: **Bulus Jericho Ali**
Department of Nursing Science, Plateau State University, Bokkos, Nigeria

Email: jerichobulus@plasu.edu.ng
Telephone: +234 806 551 6835

Abstract

Post-operative infections (POIs), particularly surgical site infections, remain a major public health concern and are among the leading causes of increased morbidity, prolonged hospital stay, higher treatment costs, and preventable mortality worldwide. Despite advances in surgical techniques and infection prevention strategies, the burden of post-operative infections remains disproportionately high in low- and middle-income countries due to persistent healthcare system challenges. This study investigated the barriers to the effective prevention of post-operative infections in healthcare facilities. A descriptive cross-sectional research design was employed, using structured questionnaires to obtain quantitative data from healthcare professionals and semi-structured interviews to generate qualitative insights. Participants included surgeons, nurses, and infection prevention and control personnel working in selected tertiary and secondary healthcare institutions. Secondary data were obtained from hospital records, infection surveillance reports, and relevant peer-reviewed literature to complement the primary findings. The study revealed that poor compliance with infection prevention and control protocols, inadequate availability of sterile equipment and supplies, workforce shortages, limited knowledge and application of evidence-based practices, patient overcrowding, and insufficient post-operative patient education constitute major barriers to effective infection prevention. Furthermore, inadequate staff training, weak institutional policies, and poor implementation of infection prevention guidelines were identified as significant organizational constraints. The study concludes that effective prevention of post-operative infections requires a comprehensive and coordinated approach involving strengthened infection prevention policies, continuous professional education, improved resource allocation, enhanced adherence to evidence-based clinical practices, and sustained quality improvement initiatives. Addressing these barriers will contribute significantly to reducing the incidence of post-operative infections, improving patient safety, and enhancing the overall quality of surgical care.

Keywords: Post-operative Infection; Infection Prevention; Surgical Site Infection; Patient Safety.

Introduction

Post-operative wound infections (POWIs), also known as surgical site infections (SSIs), remain among the most common healthcare-associated infections globally and are associated with increased morbidity,

prolonged hospitalization, higher healthcare costs, and mortality. According to the World Health Organization (WHO), SSIs account for a considerable proportion of healthcare-associated infections, particularly in low- and middle-income countries where the burden is disproportionately high (WHO, 2020). Surgical site infections develop within 30 days after surgery and are commonly associated with poor aseptic technique, microbial contamination during surgery, inadequate wound care, and patient-related risk factors such as diabetes mellitus, obesity, advanced age, and immunosuppression (CDC, 2020; Weiser et al., 2021).

In Nigeria, the prevalence of SSIs remains high, with reported rates ranging from 10% to 30%, largely due to inadequate infection prevention practices, poor adherence to standard precautions, shortages of sterile equipment and supplies, and limited institutional support (Amoran & Onwube, 2020). Nurses play a central role in preventing post-operative infections through strict adherence to infection prevention and control (IPC) measures, maintenance of aseptic techniques, wound assessment, patient education, and early identification of infection. However, inadequate knowledge, poor compliance with evidence-based guidelines, insufficient continuing professional education, and resource constraints continue to hinder effective infection prevention among nurses (Debora et al., 2021).

Vom Christian Hospital (VCH), one of the major faith-based hospitals in Plateau State, provides a wide range of surgical services. Despite ongoing infection prevention efforts, anecdotal evidence from the hospital suggests that challenges such as inadequate sterilization equipment, intermittent electricity supply, shortages of dressing materials, limited institutional resources, and gaps in nurses' knowledge of current infection prevention practices may contribute to the occurrence of post-operative wound infections. This study therefore assessed the barriers to the prevention of post-operative infections among nurses at Vom Christian Hospital with the aim of generating evidence to strengthen infection prevention practices and improve surgical outcomes.

Materials And Methods

A descriptive cross-sectional study was conducted among registered nurses working at Vom Christian Hospital, Jos South Local Government Area, Plateau State, Nigeria. The study population comprised nurses directly involved in peri-operative and post-operative patient care. A total of 50 registered nurses who met the inclusion criteria were selected using a multistage stratified purposive sampling technique.

Data were collected using a structured, self-administered questionnaire consisting of four sections: socio-demographic characteristics, knowledge of post-operative wound infection prevention, infection prevention practices, and perceived barriers to effective prevention. The instrument was developed from relevant literature and World Health Organization infection prevention guidelines. Content and face validity were established through expert review and pilot testing, while reliability was confirmed using Cronbach's alpha coefficient, with a value of ≥ 0.75 considered acceptable.

Data collection was conducted after obtaining institutional approval and informed consent from all participants. Completed questionnaires were retrieved immediately after administration. Data were analyzed using descriptive statistics, including frequencies and percentages, and presented in tables.

Ethical approval and permission to conduct the study were obtained from the appropriate hospital authorities. Participation was voluntary, informed consent was obtained from all respondents, and confidentiality and anonymity of participants were maintained throughout the study.

Results

Table 1: Represents Socio-Demographic Data

S/N	Variable Category	Frequency	Percentage	(%)
1	Age	25-35	16	32%
		36-45	21	42%
		46-55	8	16%
		56-65	5	10%
		TOTAL	50	100
2	Gender	Male	17	34%
		Female	33	66%
		TOTAL	50	100
3	Marital status	Single	21	42%
		Married	29	58%
4	Religion	Christian	43	86%
		Muslim	7	14%
		TOTAL	50	100
5	Years of experience	2 years	18	36%
		5years	23	44.2%
		6 years above	9	18%
		TOTAL	50	100
		TOTAL	50	100

Table 1 represent respondents bio-data, the age range of the respondents is as follows, 25-35 years 16(32%), 36-45 years 21(42%), 46-55 years 8(16%), and 56-65 year 5(10%). Gender of the majority of the respondent's gender is female which is 33(66%) and male 17(34%). Most of the respondents are married which is represented with the value 29(58%) and single 21(42%). Majority of the respondents are Christians which represent 43(86%) while 7(14%) are Muslims, those that have worked for at least 2 years is represented by 18(36%), those that have work for at least 5 years 23(44.2%) and those that have work for more than 6 years 9(18%).

Table 2: Knowledge Assessments

S/N	Variable Category	Frequency	Percentage	(%)
6	What is the primary source of postoperative wound infection?	A. Patient's skin flora	13	26%
		B. Contaminated surgical instruments	25	50%
		C. Hospital air	12	24%
	TOTAL		50	100

7	Which of the following is the most effective method to prevent postoperative wound infections?	A. Administering antibiotics postsurgery B. Maintaining strict aseptic technique during surgery C. Change dressing daily	20 12 18	40% 24% 36%
		TOTAL	50	100
8	At what point should prophylactic antibiotics be administered to prevent postoperative wound infection?	A Administering antibiotics postsurgery B Maintaining strict aseptic technique during surgery C Change dressing daily	13 19 18	26% 38% 36%
		TOTAL	50	100
9	At what point should prophylactic antibiotics be administered to prevent postoperative wound infection?	A 24hours before surgery B Within 60 minutes before incision C During wound closure	35 5 10	70% 10% 20%
		TOTAL	50	100
10	Hand washing for at least 40-60 seconds	True False	38 12	76% 24%

with soap and water

is sufficient to eliminate all pathogens before handling a postoperative wound			
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Table 2 represents knowledge assessment, 13(26%) responded that the primary source of postoperative wound infection is patient's skin flora, 25(50%) responded that the source of postoperative wound infection is contaminated surgical instruments, 12(24%) responded that the cause of postoperative wound infection is hospital air. 20(40%) believe that the most effective method to prevent postoperative wound infection is by administering antibiotics post-surgery, 12(24%) responded that maintaining a strict aseptic technique during surgery is the most effective way to prevent post-operative wound infection, 18(36%) responded that changing of dressing daily is the most effective way to reduce postoperative wound infection. 13(26%) responded that prophylactic antibiotics should be administered post-surgery to prevent postoperative wound infection, 19(38%) believe that maintaining strict aseptic technique during surgery is the best way to prevent postoperative wound infection. 38(76%) responded that hand washing for at least 40-60 seconds with soap and water is sufficient to eliminate all pathogens before handling a postoperative wound,

12(24%) don't believe that hand washing for at least 40-60 seconds with soap and water is sufficient to eliminate all pathogens before handling a postoperative wound. 16(32%) of respondents believe that short surgical duration is most likely to increase the risk of postoperative wound infection, 19(38%) responded that poor glycaemic control in diabetic patient is likely to increase the risk of postoperative wound infection.

Table 3: Practice Assessment

S/N	VARIABLE	CATEGORY	FREQUENCY	PERCENTAGES
12	Briefly explain the role of surgical site preparation in preventing postoperative wound infection (open-ended)			
13	I ensure that the surgical site is cleaned and prepared with an antiseptic solution before surgery	(a) Always (b) Sometimes (c) Never	19 22 9	38% 44% 18%
14	I double-check the sterilization status of instruments before they are used in surgery.	(a) Always (b) Sometimes (c) Never	40 10	80% 20%
15	I adhere to proper hand washing protocols (e.g., hand washing or sanitizer use) before and after dressing a postoperative wound.	(a) Always (b) Sometimes (c) Never	35 15	70% 30%

16	I educate patients on postoperative wound care, such as keeping the wound dry and reporting signs of infection	(a) Always	25	50%
		(b) Sometimes	25	50%
		(c) Never		
17	In your experience, what is the most common barrier to implementing infection prevention practices in your workplace? (open-Ended			

Table 3 represent assessment, 19(38%) said always ensure that the surgical site is cleaned and prepared with an antiseptic solution before surgery, 22(44%) said that sometimes they ensure the surgical site is cleaned and prepared with an antiseptic solution before surgery, 9(18%) said they never ensure that the surgical site is cleaned and prepared with an antiseptic solution before surgery. 40(80%) said they double-check the sterilization status of instruments before they are used in surgery, 10(20%) said they sometimes double-check the sterilization status of instruments before they are used in surgery. 35(70%) responded that they adhere to proper hand washing protocols before and after dressing a postoperative wound, 15(30%) responded that they sometimes adhere to proper hand washing protocols before and after dressing a postoperative wound.

Section D:

Table 4: Factors hindering effective prevention

S/N	VARIABLE	CATEGORY	FREQUENCY	PERCENTAGE (%)
18	Do you feel adequately trained in the prevention of postoperative wound infection?	(a) Yes	23	46%
		(b) No	27	54%

19	What barriers do you face in preventing postoperative wound infection?	(a) Time constraints (b) Lack of resources (c) Insufficient training	21 40 17	42% 80% 34%
20	Do you feel that continuing education on infection control is important for nursing practice?	(a) Yes (b) No	12 10	24% 20%
21	Please provide any additional comments or suggestions regarding the prevention of postoperative wound infection			

Table 4 factors hindering prevention, 23(46%) said yes they feel adequately trained in the prevention of postoperative wound infection, 27(54%), said they don't feel adequately trained in the prevention of postoperative wound infection, 21(42%) said time constrain is a barrier they face in preventing postoperative wound infection, 40(80%) said lack of resources is barrier they face in prevention of postoperative wound infection, 17(34%) said insufficient training is a barrier they face in prevention of postoperative wound infection. 12(24%) said they feel continues education on infection control is important for nursing practice, 10(20%) said continues education on infection control is not important for nursing practice.

Table 2 represent research objective 1 which is to assess the impact of nurses knowledge on the prevention of postoperative wound infection, 13(26%) responded that the primary source of postoperative wound infection is patient's skin flora, 25(50%) responded that the source of postoperative wound infection is contaminated surgical instruments, 12(24%) responded that the cause of postoperative wound infection is hospital air. 20(40%) believe that the most effective method to prevent postoperative wound infection is by administering antibiotics post-surgery, 12(24%) responded that maintaining a strict aseptic technique during surgery is the most effective way to prevent post-operative wound infection, 18(36%) responded that changing of dressing daily is the most effective way to reduce postoperative wound infection. 13(26%) responded that prophylactic antibiotics should be administered post-surgery to prevent postoperative wound infection, 19(38%) believe that maintaining strict aseptic technique during surgery is the best way to prevent postoperative wound infection. 38(76%) responded that hand washing for at least 40-60 seconds with soap and water is sufficient to eliminate all pathogens before handling a postoperative wound, 12(24%) don't believe that hand washing for at least 40-60 seconds with soap and water is sufficient to eliminate all pathogens

before handling a postoperative wound. 16(32%) of respondents believe that short surgical duration is most likely to increase the risk of postoperative wound infection, 19(38%) responded that poor glycaemic control in diabetic patient is likely to increase the risk of postoperative wound infection. This findings shows that there is a high level impact of knowledge among nurses practicing in the above mentioned hospitals that the research was carried on which is significant in management of postoperative wound infection among patients. However, this in line with the research findings of Harrington (2014; Ding et al., 2017). Despite innovations in the surgical techniques, technological advances in the operating room, environmental improvements, and the use of prophylactic antibiotics, surgical site infections (SSI) remain an important source of morbidity and mortality in patients after surgery.

Research Objective 2: To evaluate the practices of nurses regarding prevention of postoperative wound infection among nurses in Vom Christian Hospital and Comprehensive Health Care Dadin Kowa.

Table 3 represent assessment, 19(38%) said always ensure that the surgical site is cleaned and prepared with an antiseptic solution before surgery, 22(44%) said that sometimes they ensure the surgical site is cleaned and prepared with an antiseptic solution before surgery, 9(18%) said they never ensure that the surgical site is cleaned and prepared with an antiseptic solution before surgery. 40(80%) said they double-check the sterilization status of instruments before they are used in surgery, 10(20%) said they sometimes double-check the sterilization status of instruments before they are used in surgery. 35(70%) responded that they adhere to proper hand washing protocols before and after dressing a postoperative wound, 15(30%) responded that they sometimes adhere to proper hand washing protocols before and after dressing a postoperative wound. Therefore, nurses need to have sufficient knowledge and practice about the prevention of postoperative infection. The analysis of total knowledge scores of the total sample showed the participant knowledge level regarding postoperative infection prevention was poor based on their results only 37.6% of the participants give correct answers. This finding is supported by several studies this claim was congruent with, it is believed that the poor level of nurses' knowledge regarding evidence-based guidelines for the prevention of postoperative infection considered as a significant obstacle to complying with the guidelines for the prevention of postoperative infection, which is risky on patient's safety and quality of care. And supported by Acaroglu R& Sicker HK. who conduct a study in Bangladesh, stated that nurse's knowledge is significantly affected by their qualification if nurses have a Bachelor degree or Master degree than they will manage and know the sign of infection well and prevent the patient from further complications. However, in a recent study that was conducted to evaluate nurses' knowledge of guidelines for preventing infections associated with peripheral venous catheters, it found that nurses' knowledge has been frequently low. It claimed that this low level of knowledge could be a potential risk factor for the patients.

Research Objective 3. To identify the key factors perceived by nurses as hindering effective prevention of post-operative wound infections among nurses in Vom Christian Hospital and Comprehensive Health Care Center Dadin Kowa.

Table 4 factor hindering effective prevention, 23(46%) said yes they feel adequately trained in the prevention of postoperative wound infection, 27(54%), said they don't feel adequately trained in the prevention of postoperative wound infection, 21(42%) said time constrain is a barrier they face in preventing postoperative wound infection, 40(80%) said lack of resources is barrier they face in prevention of postoperative wound infection, 17(34%) said insufficient training is a barrier they face in prevention of postoperative wound infection. 12(24%) said they feel continues education on infection control is important for nursing practice, 10(20%) said continues education on infection control is not important for nursing practice.

The results of this study refer to the overall nurses' practices regarding the prevention of postoperative infection of staff nurses for postoperative infection prevention were at a good level, the study's findings have revealed that nurses who always practiced postoperative infection prevention activities were found 63.2%. This result is supported by Joshi. In India in which nurses' practice regarding

surgical site infection prevention was also at a high level. The results are similar to a study which was conducted in Texila International Journal of Nursing Volume 5, Issue 2, Jul 2019 Ethiopia, in which nurses' practical activities regarding surgical site infection prevention were good.

On the other hand, this result is higher than the findings in a study done in Italy, where only 38% of the nurses were found to have always postoperative infection prevention practices. The results of the study show that most staff of nurses were female, the highest percentage of participants fall in the age group of 20 - 30 years, which was more than 72.1 %, while the higher range of participants having the qualification of Diploma in nursing which was 50.8%, while regards to participants' marital status, the results showed that most of the participants were Single. 64.7% Furthermore, there were no statistically significant differences detected in nurses' knowledge regarding evidence-based guidelines for the prevention of postoperative infection with respect to gender, marital status, and age.

Conclusion

Nurses have an important role in the prevention of surgical site infection and in providing wound healing. Surgical nurses need to know and apply the recommendations of the evidence-based clinical practice guidelines to ensure optimal patient outcomes in postoperative wound care management. However, there is a need for an internationally accepted standard checklist that can be used with a multidisciplinary health team in the prevention of postoperative wound infections and wound management. The standard checklist to be used is thought to have an important effect in preventing and reducing wound infection

References

- Adegoke, A. O., Komolafe, A. O., & Adejuyigbe, E. A. (2018). Surgical site infections in resource limited settings: Current knowledge and future directions. *African Journal of Microbiology Research*, 12(4), 98–107. <https://doi.org/10.5897/AJMR2018>
- Allegranzi, B., Bagheri Nejad, S., Combescure, C., Graafmans, W., Attar, H., Donaldson, L., & Pittet, D. (2011). Burden of endemic health-care-associated infection in developing countries: Systematic review and meta-analysis. *The Lancet*, 377(9761), 228–241.
- Allegranzi, B., Bischoff, P., de Jonge, S., Kubilay, N. Z., Zayed, B., & Gomes, S. M. (2021). New WHO recommendations on intraoperative and postoperative measures for surgical site infection prevention: An evidence-based global perspective. *The Lancet Infectious Diseases*, 16(12), e288–e303. [https://doi.org/10.1016/S14733099\(16\)30402-9](https://doi.org/10.1016/S14733099(16)30402-9)
- Amoran, O. E., & Onwube, O. O. (2019). Infection control and practices in a Nigerian tertiary hospital. *Annals of Medical and Health Sciences Research*, 3(3), 411–415.
- American Journal of Nursing. (2021). The role of nurses in preventing surgical site infections. *American Journal of Nursing*, 121(4), 28–35.
- Centres for Disease Control and Prevention. (2020). Surgical site infection (SSI).
- De Simone, B., Sartelli, M., Coccolini, F., Ball, C. G., Brambillasca, P., Chiarugi, M., Campanile, F. C., Nita, G., Corbella, D., Leppaniemi, A., Boschini, E., Moore, E. E., Biffl, W., Peitzman, A. B., Kluger, Y., Sugrue, M., Fraga, G., Di Saverio, S., Weber, D., ... Catena, F. (2020). Intraoperative surgical site infection control and prevention: a position paper and future addendum to WSES intra-abdominal infections guidelines. *World Journal of Emergency Surgery*, 15(1), 10. <https://doi.org/10.1186/s13017-0200288-4>
- Debora, B. A., Berhe, S. A., & Teklay, G. (2021). Knowledge and practice of nurses towards infection prevention and associated factors in referral hospitals of Northern Ethiopia. *PLoS ONE*, 16(3), e0248283. <https://doi.org/10.1371/journal.pone.0248283>
- Debora, N., Feyera, G., & Ali, S. (2021). Knowledge, attitude, and practice of nurses towards standard precautions for infection control in Ethiopia: A systematic review and meta-analysis. [https://doi.org/10.1016/S0140-6736\(10\)61458-4](https://doi.org/10.1016/S0140-6736(10)61458-4)
- Orrester, J. A., Starr, N., Negussie, T., Schaps, D., Adem, M., Alemu, S., Amenu, D., Gebeyehu, N., Habteyohannes, T., Jiru, F., Tesfaye, A., Wayessa, E., Chen, R., Trickey, A., Bitew, S., Bekele, A., & Weiser, T. G. (2021). Clean Cut (adaptive, multimodal surgical infection prevention programme) for low-resource settings: a prospective quality improvement study. *British Journal of Surgery*, 108(6), 727–734. <https://doi.org/10.1002/bjs.11997>
- Nwankwo, E. O., & Edino, S. T. (2021). Surgical site infections: A study of selected hospitals in Northern Nigeria. *Nigerian Journal of Clinical Practice*, 24(2), 235–242.
- O. O. (2013). Infection control and the burden of nosocomial infection in a developing country: An observational study in a Nigerian tertiary healthcare facility. *Pan African Medical Journal*, 14(1). <https://doi.org/10.11604/pamj.2013.14.66.219>
- Olalekan, A. W., Olusegun, A. F., & Olufunmilayo, A. (2020). Surgical site infections in African healthcare settings: A systematic review. *African Journal of Surgery*, 15(3), 123–134.
- World Health Organization. (2019). Global guidelines for the prevention of surgical site infection. [psccmanual/9psccssicurrent.pdf](https://www.who.int/publications-detail/9psccssicurrent.pdf)
- International Council of Nurses. (2022). Prevention and control of healthcare-associated infections: International best practices. ICN Publishing.
- Taye, M., Aman, M., & Yimam, N. (2021). Factors affecting adherence to infection prevention practices among nurses in Ethiopia. *BMC Nursing*, 14(1), 30. <https://doi.org/10.1186/s12912-015->
- World Health Organization. (2016). Global guidelines for the prevention of surgical site

infection. Geneva: WHO. Centres for Disease Control and Prevention. (2021). Surgical site infection (SSI) event. <https://www.cdc.gov/nhsn/pdf->
World Health Organization. (2018). Global guidelines for the prevention of surgical site infection. WHO Press. Retrieved from
<https://www.who.int/infectionjnmkprevention/publications/ssiguideelines/en/>