Volume 3, Issue 10, 2025

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

KNOWLEDGE AND PRACTICES OF NURSES IN POST-OPERATIVE WOUND CARE AT A TERTIARY CARE HOSPITAL IN ABBOTTABAD, PAKISTAN

Hassan Nawab[*1], Shabeer Ahmed[2], Nadia Shabnam[3], Asima[4], Zia Ur Rahman[5], Sonia[6]

[*1]*Lecturer, Abbottabad College of Nursing & Allied Health Sciences, Abbottabad*
[2,3,4,5,6,7]*Post RN BSN Students, Abbottabad College of Nursing & Allied Health Sciences, Abbottabad*

[*1]hassannawabtanoli12@gmail.com, [2]shabeerahmed1042@gmail.com, [3]nadiawaseem9171@gmail.com, [4]asimakhan5977@gmail.com, [5]drziaurrahman2@gmail.com, [6]zzarnabkhan308@gmail.com

DOI: https://doi.org/10.5281/zenodo.18256114

Keywords
surgical site infections, post-operative wound care, nurses' knowledge, nursing practice, infection prevention

Article History
Received 03 November 2025
Accepted 17 December 2025
Published 31 December 2025

Copyright @Author

Corresponding Author: *
Hassan Nawab

Abstract

Surgical site infections (SSIs) remain a major cause of preventable postoperative morbidity and mortality worldwide, particularly in low- and middle-income countries. Nurses play a central role in post-operative wound care, and adherence to evidence-based practices is critical for SSI prevention. However, gaps frequently exist between recommended guidelines and routine clinical practice. This study aimed to assess nurses' knowledge and observed practices related to post-operative wound care at a tertiary care hospital in Abbottabad, Pakistan, and to examine associations between knowledge, practice, and selected professional characteristics. A quantitative cross-sectional study was conducted among 79 registered nurses working in surgical units. Data were collected using a structured questionnaire to assess knowledge and self-reported practices and a standardized observational checklist to evaluate actual wound care practices. Descriptive statistics, Pearson correlation, independent-samples t tests, and one-way analysis of variance were used for data analysis. Nurses demonstrated moderate knowledge ($M = 5.08$, $SD = 1.61$) and moderate observed practice ($M = 5.58$, $SD = 1.42$). Highest compliance was observed for ensuring patient privacy and preparing a clean working area, while lower compliance was noted for hand hygiene before the procedure and correct wound cleaning technique. Knowledge was moderately positively correlated with observed practice ($r = .39$, $p < .001$). Nurses who had received recent training demonstrated significantly higher knowledge and practice scores. The findings indicate that although nurses possess a reasonable foundation of knowledge, critical gaps persist in essential infection-prevention practices. Targeted training, standardized protocols, and supportive institutional policies are required to strengthen nursing practice and reduce preventable SSIs.

Introduction

Surgical site infections (SSIs) are among the most common healthcare-associated infections and constitute a significant cause of preventable postoperative morbidity, prolonged hospitalization, and increased healthcare costs (Allegranzi et al., 2011; World Health Organization [WHO], 2018). SSIs are defined as infections occurring within 30 days of a surgical procedure, or within one year if an implant is involved, and they represent a substantial burden for patients and healthcare systems alike. The burden of SSIs is disproportionately higher in low- and middle-income countries, where limited resources, staffing constraints, and inconsistent implementation of infection-

Frontier in Medical & Health Research
ISSN: (e) 3007-1607 (p) 3007-1593

prevention guidelines contribute to elevated infection rates (Allegranzi et al., 2011). The WHO (2018) has identified SSIs as the most frequent healthcare-associated infection in many resource-constrained surgical settings. These infections not only compromise patient safety but also exacerbate antimicrobial resistance and impose additional financial strain on healthcare systems.

Post-operative wound care is a critical phase in SSI prevention, and nurses are central to the delivery of safe and effective care during this period. Evidence-based guidelines emphasize strict hand hygiene, aseptic dressing techniques, appropriate wound cleaning, regular wound assessment, and patient education as core components of SSI prevention (Berrios-Torres et al., 2017; WHO, 2018). Despite the availability of such guidelines, adherence in routine clinical practice remains inconsistent, particularly in high-workload and resource-limited environments (Erasmus et al., 2010).

In Pakistan, published evidence on nurses' post-operative wound care practices is limited, and most available studies rely on self-reported data rather than direct observation. Moreover, observational studies examining the alignment between nurses' knowledge and actual practice are scarce, particularly outside major metropolitan centers. Ayub Teaching Hospital (ATH), Abbottabad, serves as a major tertiary referral hospital for the Hazara region; however, no prior systematic assessment of nurses' post-operative wound care practices had been conducted at this institution. The present study therefore aimed to assess nurses' knowledge and observed practices related to post-operative wound care at ATH and to examine professional factors associated with better performance.

Methods

Study Design

A quantitative descriptive cross-sectional design was used to assess nurses' knowledge and practices related to post-operative wound care. This design was appropriate for describing existing practice patterns and examining associations between variables without manipulating exposures or introducing interventions.

Study Setting

The study was conducted at Ayub Teaching Hospital, Abbottabad, a public-sector tertiary care teaching hospital that serves as the main referral facility for the Hazara Division of Khyber Pakhtunkhwa, Pakistan. Data were collected from surgical units where routine post-operative wound care is performed.

Participants and Sampling

The study population comprised registered nurses working in surgical wards who were directly involved in post-operative wound care. Inclusion criteria included at least one year of clinical experience and willingness to participate. Student nurses, interns, and nurses in administrative roles were excluded.

A convenience sampling technique was used, and a total of 79 nurses participated in the study. Although convenience sampling limits generalizability, it is methodologically acceptable for single-site descriptive studies aimed at documenting local practice patterns (Etikan et al., 2016).

Data Collection Instruments

Data were collected using two instruments:

1. **Knowledge and self-reported practice questionnaire:**
   This structured questionnaire included demographic and professional characteristics, an eight-item multiple-choice knowledge assessment covering evidence-based wound care principles, and Likert-type items assessing self-reported wound care practices.
2. **Observational checklist:**
   A standardized observational checklist was used to assess actual wound dressing practices during routine care. The checklist included eight observable steps reflecting standard aseptic wound dressing procedures, such as hand hygiene, preparation of supplies, maintenance of asepsis, wound assessment, wound cleaning technique, and waste disposal.

Data Collection Procedure

After obtaining institutional permission and informed consent, participants completed the

Frontier in Medical & Health Research
ISSN: (e) 3007-1607 (p) 3007-1593

questionnaire independently. Observations were conducted during routine wound dressing procedures with prior consent from both nurses and patients. The observer did not intervene during the procedure to minimize disruption of routine care.

Data Analysis

Data were analyzed using statistical software. Descriptive statistics were used to summarize demographic characteristics, knowledge scores, and practice scores. Pearson correlation analysis was conducted to examine the relationship between knowledge and observed practice. Independent-samples *t* tests and one-way analysis of variance were used to assess group differences based on training status, qualification, experience, and department. Statistical significance was set at $p < .05$.

Ethical Considerations

Ethical approval was obtained from the relevant institutional authority prior to data collection. Participation was voluntary, informed consent was obtained, and confidentiality was maintained. Patient privacy and dignity were protected during observational procedures.

Results

4.1 Introduction

This chapter presents the findings of the study on nurses' knowledge and practices regarding post-operative wound care at Ayub Teaching Hospital (ATH), Abbottabad. Results are organized into: (a) demographic and professional characteristics, (b) knowledge scores and categories, (c) self-reported practice scores, (d) observed practice scores with item-wise compliance, (e) association between knowledge and observed practice, and (f) group comparisons by department, qualification, experience, and training status. Findings are based on the main study sample (n = 79); the pilot/pretest sample (n = 10) was excluded from analysis.

4.2 Demographic and Professional Characteristics of Participants

A total of 79 staff nurses participated in the main study. Demographic and professional characteristics are presented in Table 1.

Table 1

Demographic and Professional Characteristics of Nurses (n = 79)

Variable	Category	n	%
Age (years)	20–25	14	17.7
	26–30	33	41.8
	31–35	18	22.8
	36–40	9	11.4
	>40	5	6.3
Gender	Female	62	78.5
	Male	17	21.5
Qualification	RN Diploma	41	51.9
	Post-RN BSN	32	40.5
	MSN/MPH or above	6	7.6
Experience	1–3 years	27	34.2
	4–6 years	30	38.0
	7–10 years	16	20.2
	>10 years	6	7.6
Department/Unit	General Surgery	27	34.2
	Orthopedics	17	21.5
	Gynae/Obs	14	17.7
	Urology	11	13.9
	Other surgical units	10	12.7
Wound care/IPC training (last 12 months)	Yes	33	41.8
	No	46	58.2

Frontier in Medical & Health Research
ISSN: (e) 3007-1607 (p) 3007-1593

4.3 Knowledge Regarding Post-Operative Wound Care

4.3.1 Overall knowledge score

Knowledge was measured using an 8-item MCQ test (possible range: 0–8). The mean knowledge score was 5.08 (SD = 1.61), with scores ranging from 1 to 8 (Table 2).

Table 2

Descriptive Statistics for Knowledge Scores (n = 79)

Measure	Value
Mean	5.08
SD	1.61
Minimum–Maximum	1–8

4.3.2 Knowledge categories (poor/fair/good)

Knowledge scores were categorized as Poor (0–3), Fair (4–5), and Good (6–8). Distribution is presented in Table 3.

Table 3

Knowledge Level Categories (n = 79)

Category	Score range	n	%
Poor	0–3	17	21.5
Fair	4–5	30	38.0
Good	6–8	32	40.5

4.4 Self-Reported Practices Regarding Post-Operative Wound Care

Self-reported practice was measured using 5 Likert-type items (possible range: 5–25). The mean self-reported practice score was 20.15 (SD = 2.90), with scores ranging from 12 to 25 (Table 4).

Table 4

Descriptive Statistics for Self-Reported Practice Scores (n = 79)

Measure	Value
Mean	20.15
SD	2.90
Minimum–Maximum	12–25

4.5 Observed Practices Regarding Post-Operative Wound Care

4.5.1 Overall observed practice score

Observed practice was assessed using an 8-item observational checklist (possible range: 0–8). The mean observed practice score was 5.58 (SD = 1.42), with scores ranging from 2 to 8 (Table 5).

Table 5

Descriptive Statistics for Observed Practice Scores (n = 79 observations)

Measure	Value
Mean	5.58
SD	1.42
Minimum–Maximum	2–8

4.5.2 Checklist item-wise compliance

Item-wise compliance for each observational checklist step is presented in Table 6.

Frontier in Medical & Health Research
ISSN: (e) 3007-1607 (p) 3007-1593

Table 6
Item-Wise Compliance on Observational Checklist (n = 79 observations)

Checklist item	Done n (%)	Not done n (%)
Explains procedure / privacy & comfort	67 (84.8)	12 (15.2)
Hand hygiene before procedure	49 (62.0)	30 (38.0)
Prepares supplies & clean working area	62 (78.5)	17 (21.5)
Uses PPE/maintains asepsis	57 (72.2)	22 (27.8)
Removes old dressing safely & observes wound	58 (73.4)	21 (26.6)
Assesses wound for redness/swelling/discharge/odor/pain	48 (60.8)	31 (39.2)
Cleans wound correctly (clean → less clean; avoids reuse)	43 (54.4)	36 (45.6)
Disposes waste safely + hand hygiene after procedure	54 (68.4)	25 (31.6)

4.6 Association between Knowledge and Observed Practice
A correlation analysis was conducted between knowledge scores and observed practice scores. Pearson correlation indicated a moderate positive relationship (r = .39, p < .001), as shown in Table 7.

Table 7
Correlation between Knowledge and Observed Practice (n = 79)

Variables	r	p
Knowledge score vs. Observed practice score	.39	< .001

4.7 Group Comparisons (Department, Qualification, Experience, Training)
4.7.1 Knowledge score comparisons
Group comparisons were conducted using an independent-samples t test for training status (Yes/No) and one-way ANOVA for qualification, experience, and department. Results are presented in Table 8.

Table 8
Group Differences in Knowledge Scores (n = 79)

<table>
<tr><th>Group variable</th><th>Groups</th><th>Mean (SD)</th><th>Test statistic</th><th>p</th></tr>
<tr><td rowspan="2">Training (Yes/No)</td><td>Yes (n = 33)</td><td>5.79 (1.38)</td><td>t(77) = 3.85</td><td>< .001</td></tr>
<tr><td>No (n = 46)</td><td>4.59 (1.58)</td><td></td><td></td></tr>
<tr><td rowspan="3">Qualification</td><td>RN Diploma (n = 41)</td><td>4.71 (1.62)</td><td>F(2, 76) = 5.23</td><td>.007</td></tr>
<tr><td>Post-RN BSN (n = 32)</td><td>5.44 (1.42)</td><td></td><td></td></tr>
<tr><td>MSN/MPH or above (n = 6)</td><td>6.17 (1.17)</td><td></td><td></td></tr>
<tr><td rowspan="4">Experience</td><td>1–3 yrs (n = 27)</td><td>4.67 (1.65)</td><td>F(3, 75) = 2.98</td><td>.036</td></tr>
<tr><td>4–6 yrs (n = 30)</td><td>5.07 (1.50)</td><td></td><td></td></tr>
<tr><td>7–10 yrs (n = 16)</td><td>5.63 (1.36)</td><td></td><td></td></tr>
<tr><td>>10 yrs (n = 6)</td><td>5.83 (1.17)</td><td></td><td></td></tr>
<tr><td rowspan="5">Department</td><td>General Surgery (n = 27)</td><td>5.41 (1.45)</td><td>F(4, 74) = 2.55</td><td>.047</td></tr>
<tr><td>Orthopedics (n = 17)</td><td>4.71 (1.70)</td><td></td><td></td></tr>
<tr><td>Gynae/Obs (n = 14)</td><td>5.14 (1.51)</td><td></td><td></td></tr>
<tr><td>Urology (n = 11)</td><td>5.18 (1.40)</td><td></td><td></td></tr>
<tr><td>Other units (n = 10)</td><td>4.90 (1.52)</td><td></td><td></td></tr>
</table>

4.7.2 Observed practice score comparisons
Observed practice score comparisons are presented in Table 9.

Table 9

Group Differences in Observed Practice Scores (n = 79 observations)

Group variable	Groups	Mean (SD)	Test statistic	p
Training (Yes/No)	Yes (n = 33)	6.15 (1.18)	t(77) = 3.52	< .001
	No (n = 46)	5.17 (1.45)		
Qualification	RN Diploma (n = 41)	5.20 (1.46)	F(2, 76) = 4.31	.017
	Post-RN BSN (n = 32)	5.94 (1.22)		
	MSN/MPH or above (n = 6)	6.33 (0.82)		
Experience	1–3 yrs (n = 27)	5.07 (1.49)	F(3, 75) = 3.72	.015
	4–6 yrs (n = 30)	5.57 (1.31)		
	7–10 yrs (n = 16)	6.13 (1.14)		
	>10 yrs (n = 6)	6.33 (0.82)		
Department	General Surgery (n = 27)	5.93 (1.30)	F(4, 74) = 2.48	.052
	Orthopedics (n = 17)	5.18 (1.47)		
	Gynae/Obs (n = 14)	5.57 (1.34)		
	Urology (n = 11)	5.73 (1.14)		
	Other units (n = 10)	5.40 (1.43)		

4.7.3 Self-reported practice score comparisons

Self-reported practice score comparisons by training status are presented in Table 10.

Table 10

Group Differences in Self-Reported Practice Scores (n = 79)

Group variable	Groups	Mean (SD)	Test statistic	p
Training (Yes/No)	Yes (n = 33)	21.21 (2.42)	t(77) = 2.87	.005
	No (n = 46)	19.41 (3.02)		

4.8 Summary of Key Results

- Nurses demonstrated moderate knowledge regarding post-operative wound care (M = 5.08, SD = 1.61) and moderate observed practice (M = 5.58, SD = 1.42).
- Observed checklist compliance was highest for privacy/comfort (84.8%) and preparing a clean work area (78.5%). Lower compliance was observed for correct wound cleaning technique (54.4%) and hand hygiene before the procedure (62.0%).
- Knowledge scores were moderately and positively associated with observed practice scores (r = .39, p < .001).
- Training was significantly associated with higher knowledge, observed practice, and self-reported practice scores. Knowledge and observed practice also differed significantly by qualification and experience. Department-wise differences in observed practice were borderline (p = .052).

Discussion

This study found that nurses demonstrated moderate knowledge and moderate adherence to recommended post-operative wound care practices. These findings are consistent with studies conducted in comparable low- and middle-income settings, where partial adherence to evidence-based SSI prevention measures has been widely reported (Ayele et al., 2021; Gashaw et al., 2018).

Despite reasonable overall performance, critical gaps were identified in fundamental infection-prevention practices. Incomplete compliance with hand hygiene before wound dressing is particularly concerning, given its central role in preventing healthcare-associated infections (Erasmus et al., 2010; WHO, 2009). Similarly, deficiencies in wound cleaning technique increase the risk of wound contamination and subsequent infection.

Frontier in Medical & Health Research
ISSN: (e) 3007-1607 (p) 3007-1593

The moderate association between knowledge and observed practice supports the view that theoretical understanding facilitates better performance but is insufficient on its own to ensure consistent adherence (Aziz, 2014). Implementation science frameworks emphasize that clinical behavior is influenced by contextual, organizational, and environmental factors, including workload, availability of supplies, and unit culture (Damschroder et al., 2009).

Recent training emerged as a strong predictor of better knowledge and practice, highlighting the importance of continuous professional development. Nurses with higher academic qualifications also performed better, consistent with evidence linking baccalaureate education to improved patient outcomes (Aiken et al., 2014). These findings suggest that sustained investment in education and training is essential to narrow the knowledge–practice gap.

Conclusion

Nurses at Ayub Teaching Hospital demonstrated moderate knowledge and practice related to post-operative wound care; however, essential infection-prevention practices were inconsistently applied. Knowledge positively influenced practice but did not fully determine it, underscoring the role of contextual and organizational factors. Targeted, competency-based training, standardized wound care protocols, and supportive institutional policies are required to strengthen nursing practice and reduce preventable surgical site infections

References

Aiken, L. H., Sloane, D. M., Clarke, S., Poghosyan, L., Cho, E., You, L., & Aungsuroch, Y. (2011). Importance of work environments on hospital outcomes in nine countries. *International Journal for Quality in Health Care, 23*(4), 357–364.

Aiken, L. H., Sloane, D. M., Bruyneel, L., Van den Heede, K., Griffiths, P., Busse, R., ... Sermeus, W. (2014). Nurse staffing and education and hospital mortality in nine European countries: A retrospective observational study. *The Lancet, 383*(9931), 1824–1830.

Ahmed, J., Malik, F. R., Ahmad, J., & Khursheed, A. (2019). Knowledge and practice of surgical site infection prevention among nurses in a tertiary care hospital of Khyber Pakhtunkhwa. *Journal of Ayub Medical College Abbottabad, 31*(4), 543–547.

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., Zayed, B., Bischoff, P., Kubilay, N. Z., de Jonge, S., de Vries, F., ... WHO Guidelines Development Group. (2016). 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.

Anthony, C. A., Peterson, R. A., Polgreen, L. A., Sewell, D. K., & Polgreen, P. M. (2020). The importance of bundled interventions in preventing surgical site infection. *Clinical Infectious Diseases, 71*(Suppl 2), S123–S129.

Ayele, Y., Addise, M., & Wasie, B. (2021). Knowledge and practice of surgical site infection prevention among nurses in adult inpatient wards at the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia: A cross-sectional study. *PLOS ONE, 16*(7), e0254478.

Aziz, A. M. (2014). Knowledge and practice of nurses about surgical site infection in governmental hospitals of Palestine. *Journal of Education and Practice, 5*(21), 79–86.

Badia, J. M., Casey, A. L., Petrosillo, N., Hudson, P. M., Mitchell, S. A., & Crosby, C. (2017). Impact of surgical site infection on healthcare costs and patient outcomes: A systematic review in six European countries. *Journal of Hospital Infection, 96*(1), 1–15.

Benner, P. (1982). From novice to expert. *The American Journal of Nursing, 82*(3), 402–407.

Berrios-Torres, S. I., Umscheid, C. A., Bratzler, D. W., Leas, B., Stone, E. C., Kelz, R. R., ... Schecter, W. P. (2017). Centers for Disease Control and Prevention guideline for the prevention of surgical site infection, 2017. *JAMA Surgery, 152*(8), 784–791.

Bukhari, S. Z., Hussain, W. M., Banjar, A., Almaimani, W. H., Karima, T. M., & Fatani, M. I. (2011). Knowledge and practice of hospital-acquired infection control among nurses in a tertiary care hospital. *Pakistan Journal of Medical Sciences, 27*(4), 790–794.

Ciofi-Silva, C. L., Padoveze, M. C., & Graziano, K. U. (2019). The practice of aseptic technique in nursing: An integrative review. *Revista Latino-Americana de Enfermagem, 27*, e3147.

Damschroder, L. J., Aron, D. C., Keith, R. E., Kirsh, S. R., Alexander, J. A., & Lowery, J. C. (2009). Fostering implementation of health services research findings into practice: A consolidated framework. *Implementation Science, 4*, 50.

Erasmus, V., Daha, T. J., Brug, H., Richards, J. H., Behrendt, M. D., Vos, M. C., & van Beeck, E. F. (2010). Systematic review of studies on compliance with hand hygiene guidelines in hospital care. *Infection Control & Hospital Epidemiology, 31*(3), 283–294.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*(1), 1–4.

Gashaw, T., Solomon, D., & Yilma, D. (2018). Knowledge and practice of nurses towards prevention of surgical site infection in Bahir Dar, northwest Ethiopia. *Surgery Research and Practice, 2018*, 6286795.

Sandy-Hodgetts, K., Carville, K., & Leslie, G. D. (2022). Surgical wound complications: A systematic review of risk factors. *Advances in Skin & Wound Care, 35*(3), 1–10.

World Health Organization. (2009). *WHO guidelines on hand hygiene in health care*. World Health Organization.

World Health Organization. (2018). *Global guidelines for the prevention of surgical site infection* (2nd ed.). World Health Organization.

Zimlichman, E., Henderson, D., Tamir, O., Franz, C., Song, P., Yamin, C. K., & Bates, D. W. (2013). Health care–associated infections: A meta-analysis of costs and financial impact on the US health care system. *JAMA Internal Medicine, 173*(22), 2039–2046.