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Original Research Article

NURSES KNOWLEDGE AND PRACTICE REGARDING THE PREVENTION OF SURGICAL SITE INFECTION AT TERTIARY CARE HOSPITALS IN LAHORE

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Abstract: *Surgical site infections (SSIs) are significant complications that can arise following surgical procedures, often due to lapses in surgical techniques or post-operative wound care. This study aimed to assess the level of knowledge and adherence to best practices among nurses in preventing surgical site infections (SSIs) within the complex healthcare environment of tertiary care hospitals in Lahore. A quantitative cross-sectional study design was employed to evaluate the knowledge and practices of nurses regarding SSI prevention. The research was conducted at two prominent healthcare institutions, the Services Institute of Medical Sciences (SIMS) and Lahore General Hospital (LGH). The findings of this study indicate that a substantial majority, exceeding 75% of the participants, exhibit commendable knowledge and practice in preventing surgical site infections at tertiary care hospitals in Lahore. In conclusion, the study underscores that many nurses within these tertiary care hospitals possess substantial knowledge and consistently adhere to best practices for preventing surgical site infections. This implies a promising preparedness and commitment to patient safety within this critical aspect of surgical care.*

Keywords: Infection, Surgical Site Infections, Nurses, Knowledge, Practice

Introduction

A surgical site infection (SSI) is a wound infection that develops after surgery and is thought to result from the surgery itself or the post-operative management of the surgical site. Serious side effects brought on by HAI include higher rates of morbidity and mortality as well as significant expense increases. An infection that develops in the area of the body where surgery was done is known as a surgical site infection. Sometimes, surgical site infections are superficial infections that affect the skin. More serious infections at the surgical site can damage organs, implanted materials, or subcutaneous tissues (Gizaw et al., 2022; Qasem and Hweidi, 2017).

One form of nosocomial infection that is particularly dangerous and expensive to treat overall is surgical site infection (SSI). Surgical Site Infection (SSI) is a prevalent infection linked to healthcare that significantly compromises patient safety. Nurses' actions and knowledge are crucial in halting the spread of infection. Nurses must have strong knowledge and experience in SSI prevention to deliver high-quality care. (Qasem and Hweidi, 2017; Teshager et al., 2015; Kolade et al., 2017). Every hospital's "heart and soul" is regarded as its nurses. The expertise and practices of nurses are crucial in controlling infections, ultimately improving the quality of care provided to patients (Sadia et al., 2017).

After 48 hours of admission, SSI becomes clinically apparent, or an infection may develop after the patient is discharged. SSI is the primary cause of avoidable illness and mortality in poorer nations because of inadequate infection control procedures. Research indicates that 7 to 12 percent of hospitalized patients globally suffer from social security illness (SSI), affecting over 1.4 million individuals, and is expected to cause 80,000 deaths annually (Alrebish et al., 2023).

According to estimates, the SSI rate in underdeveloped countries is 25%, although safe measures can significantly lower this number (Hodges et al., 2011).

According to World Health Organization (WHO) estimates, there are around 7.1 million occurrences of SSI annually, with 1 in 20 individuals suffering due to subpar procedures. The estimated annual cost of SSI is $30 million, much of which can be avoided (Abdissa et al., 2022).

In addition to worsening patients' lives, SSI puts undue strain on the state's finances. The so-called "surgical site infections" pose a problem for medical facilities worldwide. Patients get SSIs when hospitalized for at least 48 hours (Radu et al., 2022). In Pakistan's healthcare system, patients must wait long due to a lack of resources. Surgical site infections (SSIs) represent a significant issue, and nurses are essential in their prevention.

Nonetheless, many nurses are undertrained and educated in this field. Although it is the most effective strategy to lower SSIs, hand hygiene is not employed enough. In addition to resulting in avoidable fatalities, SSI financially strains Pakistan's healthcare system (Hendrickx and Winters, 2017).

This study aims to ascertain nurses' knowledge and practices concerning surgical site prevention. This study aims to assess the knowledge and practices of nurses in Lahore's tertiary care institutions about the prevention of surgical site infections (SSI). The study aims to examine the nurses' practices in this area and their knowledge of SSI prevention at these institutions. The first objective is to assess the nurses' knowledge in this area. All typographical, grammatical, and punctuation mistakes have been fixed.

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Methodology

A research assistant used a script to approach nurses for their participation in a quantitative cross-sectional study. The study was conducted at the Services Institute of Medical Sciences (SIMS) and Lahore General Hospital in Punjab, Pakistan, over a period of 6 months. The sample size of 150 was calculated using Solvin's formula, with a margin of error 0.05 and a population of 250 nurses working in surgical intensive care units. The sample was collected using a convenient sampling technique.

To be included in the study, nurses had to be registered and working in the surgical department of tertiary care hospitals in Lahore, have 3-5 years of clinical experience, and work in surgical intensive care units. Novice nurses and those not working in surgical departments of tertiary care hospitals in Lahore were excluded. Ethical considerations were considered, and participants were informed of the study's pros and cons. Confidentiality was maintained, and informed consent was obtained from the participants. They had the right to leave the study if they were uncomfortable participating.

Data was collected using a structured, closed-ended questionnaire with three parts: demographic variables, knowledge assessment questions, and a practice assessment Likert scale. The knowledge assessment questionnaire contained 25 multiple-choice questions, categorized as poor knowledge (0-25 scores), moderate knowledge (26-50 scores), or good knowledge (51-75 scores). The practice assessment Likert scale contained 25 statements on a 5-point scale. These were categorized as poor practice (91.8-125 scores on the Likert scale), moderate practice (126-159.2 scores on the Likert scale), or good practice (159.3-200 scores on the Likert scale).

The questionnaire's reliability and validity were checked through a pilot study. Five field experts validated the knowledge questionnaire with a Content Validity Index (CVI) of 0.90. Its internal consistency was measured through Cronbach's alpha, which was 0.818. The practice questionnaire was also validated by five field experts and had a CVI of 0.92. Its internal consistency was measured through Cronbach's alpha, which was 0.818.

Data analysis used Statistical Package for Social Sciences (SPSS) version 23.0. Descriptive analysis techniques were used to find demographic information, such as their percentages and response rates. Frequencies means, and percentages were calculated for the data analysis, which included checking the nurses' knowledge and practice of preventing surgical site infections in the hospital.

Results

Results revealed that about 74% participants were between ages 25-30 years of age, 23% were 31-35 years of age, 21% were those with educational level MSN, 25% were with diploma nursing and 53% with BScN.44% having 6-10 years of clinical experience, 20% with 1-5 years of experience, 11% more than 20 years of experience, 14% with 16-20 years of experience and 9% with 11-15 years of clinical experience (Figure, Table 1.

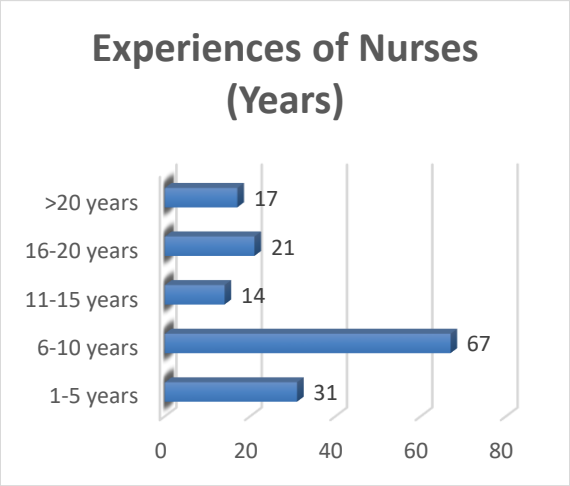

Table 1: Demographic of the study population:

Variable	Category	Frequency	Percent
Age	25-30	111	74.0
	31-35	35	23.3
	36-40	3	2.0
	>40	1	0.7
Education	Diploma in Nursing	38	25.3
	BS Nursing	80	53.3
	MS in Nursing	32	21.3
Experience	1-5 years	31	20.7
	6-10 years	67	44.7
	11-15 years	14	9.3
	16-20 years	21	14.0
	>20 years	17	11.3

Table 2: Assessment of Knowledge regarding SSI:

Statement	Correct (%)	Incorrect (%)
which one is the best method for pre-operative shaving	81%	18%
when is the best time for pre-operative hair removal	87%	12%
Which one is the best agent for pre-operative skin preparations	94%	5%

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What is the purpose of pre-operative skin preparation	99%	0.6667%
How would you disinfect the surgical side before surgery	95.33%	4.667%
Which one is the true answer for prophylaxis antibiotic	95.33%	4.667%
When should you administer prophylaxis antibiotics to surgical patients	96.667%	3.3333%
What is the purpose of pre-operative showering	98%	2%
what is the best skin agent for pre-operative showering to prevent surgical site infection	88.667%	11.333%
which one is the correct for the malnourished surgical patient	98%	2%
What are laboratories for assessing a patient's nutritional status?	93.333%	6.6667%
What is the correct level of blood sugar that enhances functions of white blood cells adequate to prevent SSI	86.667%	13.333%
what is the best antiseptic solution to disinfect the surface of the dressing trolley	91.333%	8.6667%
what is the correct purpose for surgical hand washing	83.333%	16.667%
Which one is the correct answer for the benefit of wound dressing	84%	16%
when do you change the surgical wound dressing	72%	28%
How do you select a dressing solution?	82.667%	17.333%
How do you select a dressing solution	83.333%	16.667%
what is the purpose of maintenance of normal nutritional status for surgical patients	84%	16%
what kind of diet should be provided for the post-operative patient	93.333%	6.6667%
Which one is the correct answer for surgical patients with compromised immune system	84.667%	15.333%
how do we prevent infection of patients with immunodeficiency disorder	76.667%	23.333%
which statement is correct for the diagnosis of surgical site infection	84%	16%
which answers a good sign of no surgical site infection	84%	16%
Which laboratory is used to ensure SSI	79.33%	20.67%

This table represents the percentage of respondents who provided a correct answer and those who provided an incorrect answer to each statement or question related to various aspects of pre-operative care, infection prevention, and surgical procedures. Most respondents answered these questions correctly, suggesting a strong knowledge base in these areas. However, there are variations in the percentages, with some questions having a higher rate of correct responses than others.

Table 3 Assessment of Practices of Nursing staff in the prevention of SSI:

Statement of Practice	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Is alcohol and chlorhexidine gluconate the most common antimicrobial for patient skin preparation?	26.000	20.667	4.000	8.000	41.000
Should hands be washed before and after changing wound dressing and touching the surgical site?	6.6667	4.6667	7.3333	24.000	57.333
Should hands be washed before wearing sterile gloves?	4.000	0.000	14.667	26.000	55.333
Is it advisable to perform pre-operative shaving right before surgery?	6.0403	0.000	0.000	0.000	93.960
Should pre-operative prophylactic antibiotics be administered within one hour before surgery?	21.333	0.000	0.000	0.000	78.667
Is it advisable for patients to take a pre-operative shower 6-12 hours before surgery?	14.667	0.000	0.000	0.000	85.333
Is it advisable for patients to take a pre-operative shower or bath with antimicrobial soap?	17.333	0.000	0.000	0.000	82.667
Is it important to perform prescribed glucose tests before and after surgery in diabetic patients?	8.000	0.000	8.000	2.000	82.000
Should injection insulin or oral medication be administered as ordered in diabetic patients?	16.000	0.000	0.000	0.000	84.000
Should patients' body mass index (BMI) be assessed before and after surgery?	18.000	0.000	0.000	0.000	82.000
Is it advisable to advise malnourished patients to intake nutritious (especially protein) diets?	22.000	0.000	0.000	1.3333	76.667

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Is it advisable to advise patients to take vegetables and fruits before and after surgery?	9.3333	0.000	8.000	2.000	80.667
Is it advisable to advise patients with compromised immune systems to avoid contact with infected people?	5.3333	0.000	9.3333	4.000	81.333
Should obese patients have less intake of carbohydrates?	3.3333	0.000	0.000	0.000	96.667
Should sterilized dressing materials be used for cleansing surgical wound dressing?	14.000	0.000	0.000	0.000	86.000
Should povidone-iodine and normal saline be used for cleansing surgical wound dressing?	10.000	0.000	0.000	0.000	90.000
Is it important to use an aseptic technique during surgical wound dressing?	12.667	0.000	8.6667	2.000	76.667
Is it important to learn shaving methods from others and apply them to pre-operative patients?	6.6667	0.000	15.333	2.000	76.000
Should an aseptic technique be used when obtaining a swab culture?	8.6667	0.000	0.000	0.667	90.667
Is it important to advise immunodeficiency disorder patients to maintain personal hygiene?	10.000	0.000	0.000	0.000	90.000
Should surgical site conditions be assessed and monitored?	13.333	0.000	0.000	0.000	86.667
Should infected cases be separated from non-infected cases during dressing?	7.3333	0.000	6.6667	0.000	86.000
Is it important to use a facemask during cleansing surgical wound dressing?	4.6667	0.000	8.000	4.000	83.333
Should the surface of the dressing trolley be cleaned and disinfected with the antiseptic solution?	2.6667	0.000	0.000	0.000	97.333
Should soiled material be discarded in the proper place after performing wound dressing?	21.333	6.000	2.6667	0.667	69.333

The table continues with similar statements on various practices related to pre-operative care, and the responses generally indicate a positive attitude toward following these practices. The strong agreement is observed for many of the statements, suggesting a consensus on the importance of these pre-operative practices. However, it's important to note that some respondents have neutral or disagreeing views on specific practices, although they are in the minority for most statements.

Discussion

The survey results suggest that most respondents are aligned with best practices in pre-operative care and infection prevention. This alignment is critical for ensuring patient safety, reducing the risk of surgical site infections, and improving surgical outcomes. It also indicates a healthcare community that values evidence-based practices and is committed to providing high-quality care to patients. The relatively small percentages of neutral or disagreeing responses on some statements may be areas for further education and awareness among healthcare professionals.

Results in this study revealed that about 74% of participants were between ages 25 and 30 years of age, 23% were 31-35 years of age, 21% were those with educational level MSN, 25% had with diploma nursing and 53% with BScN.44% having 6-10 years of clinical experience, 20% with 1-5 years of experience, 11% more than 20 years of experience, 14% with 16-20 years of experience and 9% with 11-15 years of clinical experience. Results showed that >75% of Practice statements indicated good practice, and >75% showed good knowledge.

A quasi-experimental study in Lahore by Nazir et al. 2021 showed similar results (post educational interventional results) that most nurses have good knowledge and practices due to education (Nazir et al., 2022).

Nurses provide care to patients 24/7 in healthcare facilities. Knowledge and practice of the nurses are the basic pillars to control infections that enhance patient care. This study has the contraindicated findings to the previous study conducted at Allied Hospital Faisalabad that nurses had poor knowledge and practice about reducing surgical site infections, highlighting the positive correlation between the knowledge and practice of nurses (Sadaf et al., 2018).

The study has limitations due to the small sample size and self-reported data, which may lead to biases. Selection bias may also be a possibility. The survey's questions may affect responses, and the study provides a snapshot of attitudes at a specific time. The lack of clinical outcomes data restricts assessing the impact of practices on patient outcomes. To address these limitations, researchers can employ validated survey instruments, strive for a more representative sample, consider longitudinal studies, and supplement survey data with clinical outcomes data.

To enhance the quality of care and ensure patient safety, the hospital organization should conduct continuing educational programs for nurses to update their knowledge and practices based on the latest evidence. Additionally, the hospital administration should provide standard guidelines to prevent surgical site infection for the nurses working in the surgical departments. Finally, it is recommended to replicate this study using an observational checklist to assess nurses' actual level of practice.

Conclusion

Based on our study findings, it can be inferred that the nurses in our study exhibited a commendable level of knowledge and practice concerning preventing surgical site

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infection. These results indicate the effectiveness of the training and interventions implemented in our study and could serve as a model for improving patient outcomes in healthcare settings worldwide.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department Concerned.
Consent for publication
Approved
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Not applicable

Conflict of interest

The authors declared absence of conflict of interest.

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