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ASSESSING KNOWLEDGE OF NURSES REGARDING SURGICAL SITE INFECTION AT TERTIARY CARE HOSPITAL, SWAT

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Abstract

Background:
These infections are further divided as superficial incisional, deep incisional and organ space infections with different risk factors and outcomes. Surgical Site Infections (SSIs) represent a significant risk in healthcare, causing prolonged recovery, increased healthcare costs, and heightened mortality.

Aim:
This study aimed to assesses the knowledge of nurses at a tertiary care hospital in Swat regarding infection control practices and SSIs.

Method:
A cross-sectional descriptive design was used, with data collected from 70 nurses using a standardized questionnaire. The study was conducted at tertiary care hospital swat. data was analyzed through SPSS software.

Result:
Findings reveal moderate to high knowledge levels in areas such as SSIs' definitions, hand hygiene, and antiseptic use. However, notable knowledge gaps were identified in patient education on SSIs (42.9% incorrect response) and postoperative wound care (32.9% incorrect response), which are critical for SSI prevention and patient recovery.

Conclusion:
These deficits highlight the need for targeted educational interventions, including workshops and practical training, to bolster nurses' knowledge in these domains. This study underscores the importance of ongoing education in enhancing nursing competencies, reducing SSI rates, and improving patient outcomes in surgical settings.

Introduction

Surgical site infections abbreviated as SSI, are derived from a surgical procedure on the body part and are infections that begin shortly after the procedure in the operated region. These infections are further divided as superficial incisional, deep incisional and organ space infections with different risk factors and outcomes. (1). SSIs are an example of one of the most frequently occurring infections often related to healthcare,

which prolong hospitalization, increase healthcare costs, or even mortality. (2).

They are the single most prevalent source of postoperative complications worldwide with risk rates differing by country and/or hospital due to certain differences in infection control and the use of resources. Research proofs reveal that restricted facilities, no or little training, and fewer infection control measures are responsible for higher infection rates in LMIC. (3). These infections play a major role in health care contributing, to about 20 percent of health care associated infections in surgical patients, causing complications which adversely affect the patient's recovery and exert pressure on health care facilities. (4)

An overwhelming number of variables contribute to the process of developing SSIs, including the patients' age, diabetes, immunocompromised status, type and duration of surgery, surgical methods, and conditions within the operating theatre. (5). Others are associated with failure in sterilization of operation instruments and misuse of Antibiotics. It is crucial for nurses, as it helps them not only to know the risk factors behind infections, but also allows nurses to manage and educate patients about ways minimizing the risks associated with developing infections. (6).

The fight against SSIs involves patients, nurses, and other officers in patient care through proper infection prevention and control measures understanding proper wound care management. (7). Although SSIs are a concern nationally and internationally to patients, leaders and policymakers cannot underestimate the need for the nurses to have knowledge on SSIs as the unique practices allows them to practice evidence-based practices including hand hygiene, use of appropriate antiseptic technique for wound care, and timely dressing changes. (8). A system knowledge of the etiology and the prevention of SSIs will enable the nurses to handle infection risks adequately and create a safe environment hence enhancing patient outcomes. (9).

Measures directed specifically to preventing SSI are preoperative antisepsis, appropriate surgical measures, and postoperative management of the surgical site. (10). The reduced incidences of surgical site infection also entailed that nurses have sufficient knowledge on the vital standards of infection control such as hand washing, use of protective clothing, and availability of sterile techniques in the operating room before and after the surgery. In this way, nurses keep pathogens away from the surgical wounds, which is one of the main reasons of SSIs. (11).

Knowledge possessed by the nurses on SSIs is an important aspect of reducing infection in surgical environment. Evaluating the extent of nurses' knowledge regarding SSIs, infection control measures as well as patient education activities gives information about current scenario. (12). The purpose of this research project will be to assess the level of awareness of the Superficial Surgical Infections among the nurses with a view of informing the development of measures that will boost on the prevention of these SSIs and, therefore, benefit the health of the patients. The study results will be used to establish guidelines, train educational and other nursing materials, and enhance nursing practices connected with SSI prevention. (13).

Methodology

A cross-sectional descriptive study design was employed to assess the level of knowledge among nurses regarding surgical site infections (SSIs). This design was appropriate because it allowed the collection of data at a single point in time without manipulation of variables, providing an accurate snapshot of nurses' existing knowledge. The study was conducted at Saidu Group of Teaching Hospital (SGTH), Swat, a major tertiary care hospital providing surgical services to a large population. The target population consisted of registered nurses working in surgical units of the hospital.

The sample size was calculated using the Raosoft online sample size calculator, applying a 95% confidence interval, 5% margin of error, and 50% response distribution. The calculated sample size was 60 nurses. A convenience sampling technique was used due to ease of access and availability of eligible participants. Nurses working in surgical units with a minimum of one year of clinical experience and holding a valid Pakistan Nursing Council (PNC) license were included in the study.

Nurses working in administrative roles, those assigned to non-surgical units, interns, unqualified personnel, and individuals unwilling to participate were excluded.

Data Collection Procedure

Data were collected using a standardized close-ended questionnaire adopted from a previously validated source. The questionnaire consisted of two sections: demographic characteristics and knowledge related to surgical site infections. Internal consistency reliability of the knowledge questionnaire was assessed using the Kuder–Richardson Formula 20 (KR-20), which yielded a reliability coefficient of 0.85, indicating good reliability.

Prior to data collection, written informed consent was obtained from each participant after explaining the purpose and objectives of the study. Participation was voluntary, and confidentiality of all collected information was strictly maintained. The questionnaires were distributed to eligible nurses during duty hours in surgical units, and completed questionnaires were collected on the same day to ensure a high response rate.

Data Analysis Procedure

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 24. Descriptive statistical methods were used to analyze the data. Continuous variables were summarized using means and standard deviations, while categorical variables were presented as frequencies and percentages. The analyzed data were organized and presented in tables and figures to facilitate clear interpretation and understanding of the findings.

Results and Analysis

Demographic Characteristics

The mean age was 31.79 years (SD = 7.54). The majority were aged 20-29 years (45.7%), followed by 30-39 years (35.7%), and 40-49 years (18.6%). Males comprised 71.4% of the sample, while females made up 28.6%. Most participants had 1-5 years of experience (57.1%), with 28.6% having 6-10 years, and 14.3% having over 11 years of experience. The participants were primarily from General Surgery (42.9%), Orthopedics (35.7%), and Pediatric Surgery (21.4%). This demographic analysis highlights the workforce's age, gender, experience, and specialty distribution.

Table 1: Demographic Characteristics of the Study Participants (n=60)

Variable	Category	Frequency (n)	Percentage (%)
Age	20-29 years	27	45.0%
	30-39 years	21	35.0%
	40-49 years	12	20.0%
Gender	Male	43	71.7%
	Female	17	28.3%
Experience	1-5 years	34	56.7%
	6-10 years	17	28.3%
	11+ years	9	15.0%
Unit	General Surgery	26	43.3%
	Orthopedics	21	35.0%
	Pediatric Surgery	13	21.7%
Qualification	General Nursing	13	21.7%
	BS Nursing	41	68.3%
	MS Nursing	2	3.3%

Variable	Category	Frequency (n)	Percentage (%)
	MPH	4	6.7%

Knowledge of Nurses Regarding Surgical Site Infections

The findings highlight the knowledge levels of participants on Surgical Site Infections (SSIs), adjusted for a sample size of 60 participants. The highest correct response rates were for the definition of SSIs and proper hand hygiene, both at 85.0% (51 out of 60 participants). This was followed by knowledge of the use of sterile techniques at 83.3% (50 participants), antiseptic use at 78.3% (47 participants), and preventive measures at 75.0% (45 participants). Lower correct response rates were noted for the symptoms of SSIs at 68.3% (41 participants) and postoperative wound care at 66.7% (40 participants). The lowest knowledge level was observed in patient education on SSIs, with only 56.7% (34 participants) answering correctly. These findings indicate significant disparities in the knowledge of healthcare workers regarding critical SSI management areas, suggesting the need for targeted educational interventions.

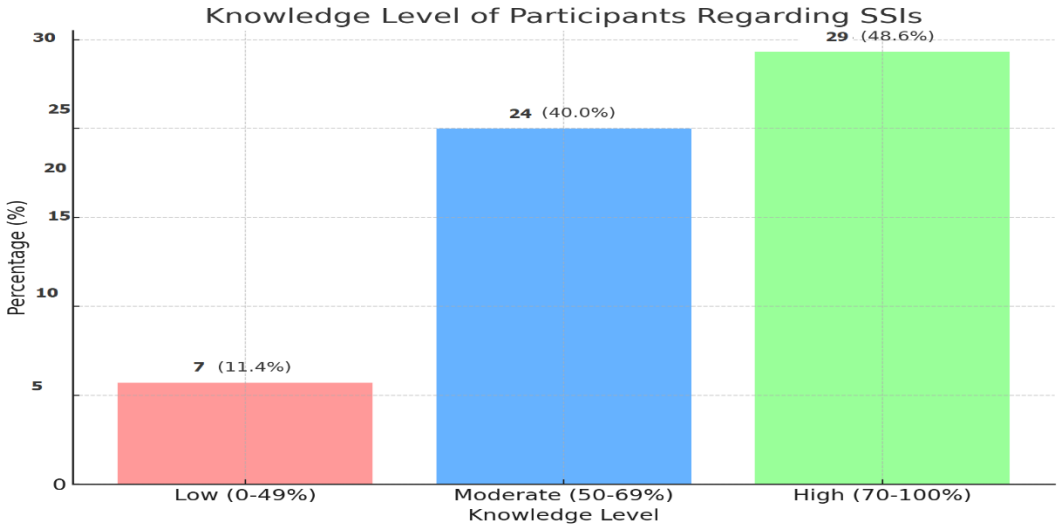
Table 2: Knowledge of Nurses Regarding Surgical Site Infections

Knowledge Areas	Correct Responses (n)	Correct Response Rate (%)
Definition of SSIs	51	85.0%
Causes of SSIs	43	71.7%
Symptoms of SSIs	41	68.3%
Risk factors for SSIs	39	65.0%
Preventive measures	45	75.0%
Postoperative wound care	40	66.7%
Use of antiseptics	47	78.3%
Proper hand hygiene	51	85.0%
Use of sterile techniques	50	83.3%
Patient education on SSIs	34	56.7%

Overall, Knowledge Levels of Nurses Regarding SSIs.

The participants' knowledge levels on Surgical Site Infections (SSIs) were categorized into three groups based on their scores. A low knowledge level, with scores ranging from 0-49%, was observed in 11.4% of participants. The majority, 40% of participants, fell into the moderate knowledge category, scoring between 50-69%. Meanwhile, 48.6% of participants demonstrated a high level of knowledge, with scores ranging from 70-100%. This distribution suggests that while most participants possess a moderate to high understanding of SSIs, there remains a segment with lower knowledge levels. These individuals could benefit from targeted educational interventions or additional training to enhance their understanding of critical SSI management practices.

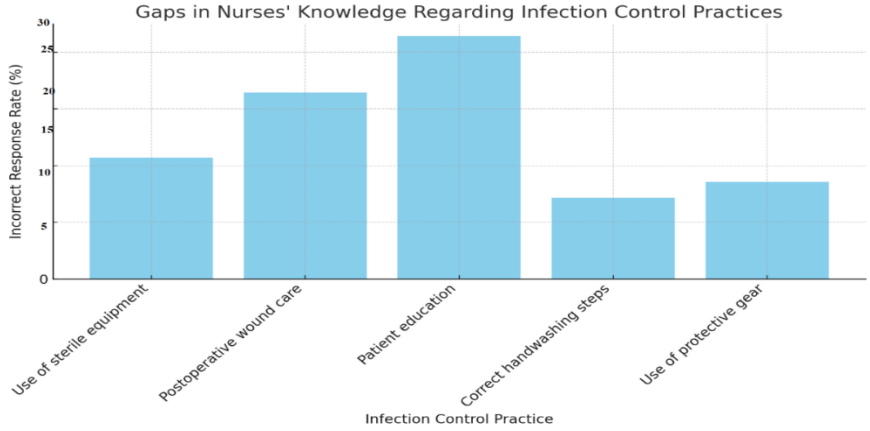
Figure 1: Overall, Knowledge Levels of Nurses Regarding SSIs



Gaps in Nurses' Knowledge Regarding Infection Control Practices

Thus, there were identified knowledge gaps in infection control practices among participants, concerning patient education on SSIs – 42,9% and postoperative wound care, – 32,9%. These gaps are deemed important because they are involved in the prevention of SSI and are patient sensitive. The dearth of research findings in these areas call for more specifically directed educational interventions for patients and postoperative wound care. This would literally could enhance the current knowledge and skills of lower performers in the specialty through filling the the-mentioned gaps in the training program designed for prevention of SSI and better infection control.

Figure 2. Gaps in Nurses' Knowledge Regarding Infection Control Practices



Discussion

This work evaluated the awareness of nurses in a tertiary healthcare facility in Swat about SSIs under the understanding that knowledge deficits contribute to infection control compromises and suboptimal patients' outcomes. The results highlight existing knowledge assets and gaps of the nurses where future personalized tailored education and infection prevention training will be based upon.

The findings of the study show that nurses have fair to good understanding of SSIs with 48.6% nurses falling in high knowledge about SSIs and 40% in moderate knowledge. These results are

consistent with prior work indicating that FNE establishes the necessary background regarding infections in the healthcare setting along with relating basic principles of infection control by using hand hygiene, adverse prevention, or sterile techniques in definite regions of high clinical risk including SSIs score for definitions and generalities and causes support the role that an FNE provides the resources needed to decrease SSI risk and other prior evidence that knowledge of standard precautions remains sharply honed among nurses (14).

One of the key revelations made in this study is the existence of apparent gaps in the existing knowledge base with regard to certain subject areas such as patient education on SSIs, as well as postoperative wound care. The study revealed that 57.1% of nurses scored satisfactory on knowledge of patient education while a mere 32.9% was knowledgeable about postoperative wound care practices. This shortfall congress with other studies that underscore the requirement for enhanced training in patient centered education within nursing curricula. These areas of suggest that even though nurses may understand principles of infection control they may feel limited in their ability to educate patients on the matter or adequately treat postoperative wounds thus patient compliance with preventive measures may be compromised after discharge. (15,16)

Still, knowledge about principles of surgical sterility and hand washing were well understood since the majority of participants scored well in theoretical questions related to infection control but some practical aspects were not consistent. Particularly, 21.4% of the nurses failed to recall the correct utilization of the sterile equipment and the personal protective aprons and gowns 17.1%. This distinction between theorizing and practice may stem from inadequacies in supervised training or from lack of drill in observing rules of infection control in clinical practice. Research has suggested that when the nurses are not being constantly reminded of the practical uses of infection control, the nurses may find it difficult to use the information when with patients. (17,18).

From the identified gaps, it is possible to find out areas for which intervention is needed most, such as training on patient education and postoperative wound care. Increasing knowledge competency of nurses in patient education might help them better persuade the patient to embrace the overall activities of preventing SSIs, increasing compliance of patients with the infection control post-surgery practices. Moreover, lectured structured and repeated refreshment trainings with the focus on the knowledge about the current IPC standards as well as the usage of protective and aseptic measures may help to close the gap between the received knowledge and clinical practice. (19).

Seeing that the sample included nurses with differing years within practice, it can also be mentioned that majority of the participants where young nurses doesn't exceed 5 years practice. This demographic trend highlights the reason of making initial preparation for effective infection control education to teach nurses practical skills during the first years of practice to support theoretical knowledge learned during basic education. (20).

This work therefore emphasizes the importance of update courses in preserving and improving awareness of SSIs amongst nurses. As such, it is apparent that although much knowledge is current and sound there is the need for targeted areas of patient education, the broad area of wound care, and specific aspects of infection control interventions. Closing these gaps enhances the nurses' contribution to prevent SSI, and hence promote safe, quality care for patients. (21).

CONCLUSION:

This paper aimed to evaluate the awareness level of the nurses working in the tertiary care hospital Swat about SSIs which can be used to recognize the aspects related to SSIs that are strong in the existing system and those are weak while planning for the more effective and efficient infection control practice as well as improvement in the patient care related to SSIs. The findings of this study show that though the overall knowledge of the nurses on the causal factors, signs, and ways of preventing SSIs is satisfactory, some areas, especially education of the patient postoperatively

and care of the wound are poorly covered. These gaps suggest that more training and education are required with a view to improving nurses' knowledge of functional aspects of infection control.

Based on the present study's results, it is recommended that more specific educational initiatives, like workshops and practical training regarding patient-centered communication and appropriate wound care, be presented to the-shown knowledge deficits. Furthermore, the organization of periodic refreshment courses to enhance knowledge of infection control methods would improve the relation between theoretical knowledge and practice, and to decrease the rate of SSIs, which would benefit the patients.

6.2. RECOMMENDATIONS OF THE STUDY:

1. **Targeted Training:** Implement knowledge deficits in the form of education on patient education, and postoperative wound-care for specialized training.
2. **Patient Education Skills:** Provide communication tools tailored to help nurses pass the necessary information to patients to avoid SSI and improve own self-safety.
3. **Regular Refresher Courses:** From time to time, offer infection control refresher for the purpose of reminding participants in courses on sterile practices, hand washing and protective attire.
4. **Practical Competency Assessments:** Carry out clinical observations, which check if implemented infection control procedures are applied adequately in practice.
5. **Mentorship Program:** Assign senior nurses to the junior nurses for them to supports them through working on the skills required for infection control.
6. **Enhanced Nursing Curricula:** The final recommendation is to enhance foundational knowledge of infection control were to include comprehensive infection control training in nursing education curricula.
7. **Infection Control Awareness Culture:** Practice and maintain an infection control awareness through rallies and frequently reminding staff and learners of best practices.
8. **Ongoing Evaluation:** Supervise results of training for assessment and enhancement of the prevention of SSI and improvement of patient outcomes.

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