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# Knowledge and Practice of Surgical Wound Management Among Professional Nurses and Final-Year Nursing Students in Western Province, Sri Lanka

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**Abstract**

**Introduction** Surgical wound management requires adequate knowledge, infection control, and wound care practices. Nurses play an important role in preventing and managing wound complications. **Objective** This study aimed to describe and compare the knowledge and practices of professional and student nurses regarding surgical wound management in Western Province, Sri Lanka. **Method** A descriptive cross-sectional study was conducted among 401 participants, consisting of 195 professional nurses and 206 student nurses. Data were collected using a structured questionnaire and analyzed using IBM SPSS Statistics version 26 through descriptive statistics. **Results** The mean knowledge score was 70.56% (SD = 9.22), indicating an average level of knowledge. Most participants (70.0%) had average knowledge, 28.7% had inadequate knowledge, and 1.2% had adequate knowledge. The mean practice score was 91.87% (SD = 5.34), indicating an adequate level of practice. Both professional and student nurses showed similar knowledge levels and good compliance with infection control and sterile techniques. **Conclusion** Both groups demonstrated adequate wound care practices but only average theoretical knowledge. Continuous education, evidence-based training, and curriculum strengthening are recommended to improve knowledge and clinical competence.

**Keywords** Surgical wound management, Wound care, Nurses, Nursing students, Surgical site infection.

## Introduction

Surgical wounds are incisions made on the skin or body tissues during surgical procedures to access the internal organs or cavities. It should be managed properly in order to improve healing and to avoid complications (1). Surgical wound management refers to a series of clinical practices involving wound assessment, aseptic dressing techniques, infection prevention, and the appropriate use of wound care products (1). Therefore, identifying current gaps in knowledge and practice is essential to enhance nursing competence in surgical wound management (2-3).

Surgical site infections are the most prevalent complication of surgical wounds. Surgical site infection is a common health-care associated infection that occurs in the surgical wound across the globe (4)(5). The microbial contamination of the surgical site during the surgical procedure or poor aseptic methods, or lack of adherence to postoperative wound care instructions, may cause this type of infection (6). A surgical site infection may be diagnosed up to 30 days after a surgical operation, this period may be expanded based on the nature of the surgery (7).

Surgical procedures are performed in millions of people globally every year. A significant proportion of people experience complications resulting from surgery, such as surgical site infections and delayed wound healing (8). Approximately, 2% to 5% of people undergoing clean surgical procedures, and a larger proportion of those undergoing emergency surgery, will develop a surgical site infection (9)(7). These complications are associated with longer hospital admissions, higher cost of care and increased morbidity and mortality rate of the patients (10)(11).

Nurses are responsible for surgical wound assessment, dressing changes, infection control practices, and patient education regarding wound care (12). Therefore, nurses require adequate knowledge and proper practice in wound care to provide safe and effective care (13)(14).

Professional nurses are expected to demonstrate advanced clinical competency in wound care management and are responsible for guiding and supervising student nurses during clinical practice (15). However, previous studies have reported a gap between knowledge and practice among professional nurses in wound care management (16)(3).

Furthermore, several studies have identified that professional nurses have inadequate knowledge regarding wound care practices, techniques of wound dressing, and factors affecting wound healing (17). Such gaps may negatively affect patient outcomes and increase the likelihood of postoperative complications (18)(19).

In Sri Lanka, limited research has been conducted to assess knowledge and practices of both professional and student nurses regarding surgical wound care, despite the significance of surgical wound management in clinical practice. Therefore, to identify existing gaps and enhance nursing competence in wound care management, it is essential to evaluate their level of knowledge and practice related to surgical wound management.

Although surgical wound management is a routine component of nursing care, limited evidence is available in Sri Lanka regarding how professional nurses and nursing students understand and perform surgical wound care. Most previous studies have focused on either nurses' knowledge or infection prevention practices, while fewer studies have compared knowledge and practice between professional nurses and nursing students. This study therefore addresses an important evidence gap by assessing both knowledge and practice related to surgical wound management among these two groups in Western Province, Sri Lanka.

The purpose of this study was to assess knowledge and practices regarding surgical wound management of professional nurses and student nurses in the Western Province of Sri Lanka.

## Methods

### Study Design

A descriptive cross-sectional study design was conducted to assess the knowledge and practice of surgical wound management among professional nurses and final-year nursing students. The study was conducted across various clinical and academic settings in the Western Province, Sri Lanka. The study included six hospitals (teaching hospitals,

district general hospitals, and base hospitals), two universities, and two nurses' training colleges.

**Sample Size**

The total sample for this study was 401 participants, consisting 206 final-year nursing students from the selected Nursing Training Schools and universities, and 195 professional nurses working in the selected hospitals.

**Sample Technique**

Multistage cluster sampling method was used to select the study participants. The first stage classified the healthcare and education institutions in Western Province, Sri Lanka in clusters as teaching hospitals, district general hospitals, base hospitals, universities and nurses training colleges.

The second stage of sampling involved selecting institutions from each cluster, using simple random sampling method. The final stage involved the recruitment of eligible professional nurses and the final year nursing students from the selected institutions following the inclusion criteria until the required sample size was achieved. The data collection process was conducted over a six-month period from November 2022 to April 2023.

**Inclusion Criteria**

Professional nurses currently working in surgical wards, operating theatres, intensive care units, and private surgical wards within the selected state hospitals. Students in their final year of nursing in the chosen universities and Nurses Training Schools were involved. Those who volunteered to participate in the study, and gave informed consent were included.

**Exclusion Criteria**

Nurses in particular fields like pediatric, psychiatric, gynecology, obstetrics, out-patient and emergency treatment units. First year and second year student nurses from Nurses Training Schools. First, second, and third year nursing students from universities.

Those who were not willing to engage in the study.

**Instrument for Data Collection**

Data were collected through a structured self-administered questionnaire developed by the researchers and based on a comprehensive literature review on surgical wound management, wound care practices and surgical site infection prevention. The questionnaire was content validated by 10 experts in Nursing and Wound Care to establish the content validity and to ensure the relevance, clarity of questions, completeness, and appropriateness of the contents with the study objectives.

The questionnaire was developed in English and then translated into both Sinhala and Tamil for better understanding of the participants. Translation was checked by bilingual nursing professionals for clarity, consistency, and appropriateness of the language used. This final questionnaire was divided into five parts: **Section 01:** Socio-demographic factors of the participants; **Section 02:** Knowledge on general wound care; **Section 03:** Knowledge regarding the surgical wound healing process; **Section 04:** Knowledge regarding surgical site infections and post-procedure care; and **Section 05:** Practices related to wound care and dressing procedures.

A pilot study was carried out on 10 participants, who were not part of the study sample, to test the clarity, feasibility and applicability of the questionnaire. A few items were subsequently changed, based on feedback received, in order to clarify and improve the wording of some items prior to the beginning of data collection. The final questionnaire was used to assess the knowledge and practices of professional nurses and final year nursing students in the Western Province of Sri Lanka regarding surgical wound management.

There was no formal reliability testing performed (Cronbach's alpha). The questionnaire was content validated using an expert review and pilot test before being used in the main study. This has been acknowledged as a limitation of the study.

**Scoring and Assessment**

**Assessment of Knowledge:** The level of knowledge on surgical wound management in professional nurses and student nurses was evaluated by 25 questions in Sections 02,03, 04. A binary system was applied in which the

correct answers were scored with one (1) point and the incorrect answers scored with zero (0). The total scores were transformed into percentages and divided into three levels inadequate, average and adequate knowledge.

**Assessment of Practice:** The practice of surgical wound care among professional nurses and student nurses was measured by the use of 25 statements in Section 5 on a 4-point Likert scale (Always = 3, Sometimes = 2, Rarely = 1, Never = 0). In the case of the two negative statements that were added to guarantee the validity of the responses, the scoring was turned inverted (Never = 3 to Always = 0). The practice scores of total were also computed and expressed in percentages.

The total score for knowledge and practice were transformed in to percentages. Then classify total score as follows, Scores<50% considered as inadequate, 50-75% considered as average and >75% as adequate.

**Ethical Considerations**

Ethical approval was obtained by the ethical review committee of the Faculty of Medicine, General Sir John Kotelawala Defence University (ERC No.: FAHS/IRSMC/NUR/2022/010) for this study. Permission was also obtained from the directors of some hospitals, deans of universities and principals of nursing training schools. Informed written consent was obtained from all participants prior to data collection. Confidentiality and anonymity of the participants were maintained throughout the study, and participation was voluntary.

**Data Collection Process**

The data was collected by the research team in the selected hospitals, universities and nursing training schools during the period from November 2022 to April 2023 in Western Province of Sri Lanka for six months. No research assistants were involved in the data collection process. The data collection process consisted of the following steps: Prior to data collection, permission was obtained from the relevant hospital directors, the university deans and principals of nursing training schools. The inclusion criteria were used to determine who was eligible. The researchers gave an explanation of the purpose, objectives and procedures of the study to the participants. All participants who chose to participate gave written informed consent. The structured self-administered questionnaires were distributed to the participants. The questionnaires were completed by the participants in a confidential room to avoid external influences and ensure privacy. The completed questionnaires were collected immediately by the researchers and checked for completeness before data entry. Confidentiality and anonymity was maintained throughout the study.

**Data Analysis**

The quantitative data were analysed using the IBM SPSS Statistics version 26. Descriptive statistics (mean, standard deviation, frequencies, and percentages) were used to describe socio-demographic characteristics and knowledge and practices of surgical wound management. The overall aim of this descriptive cross sectional study was to describe the knowledge and practices of the professional nurses and final year nursing students and therefore descriptive statistics were used for the study. Therefore, inferential statistical analyses were not performed. This approach is acknowledged as a limitation of the study, and future research is recommended to include inferential statistical analyses to examine differences between groups and factors associated with knowledge and practice.

**Results**

**Demographic characteristics of participants**

Out of 420 individuals invited to the study, 401 completed it, which is a high response rate of 95.4%. The sample consisted almost of equal amounts of final-year nursing students (n=206, 51.4%), and professional nurses (n=195, 48.6%). The cohort was mainly female (84%), aged 21-60 with majority (70.3%) being young (21-30 olds). The professional nursing staff had 70.8% with a diploma in nursing and 43.1% with a less than five years' clinical experience. In the case of their current placement, 54.9% of the professional nurses were stationed in the surgical wards during the study.

Table 1 Socio-demographic

| Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Participant Type | Student Nurses | 06 | 1.4% |
| | Professional Nurses | 95 | 8.6% |
| Gender | Female | 37 | 4.0% |
| | Male | 4 | 6.0% |
| Age Group | 21 – 30 years | 82 | 0.3% |
| | 31 – 60 years | 19 | 29.7% |
| Education | Diploma | 138 | 70.8% |
| | Degree/ Other | 57 | 9.2% |
| Experience | 5 years | 4 | 3.1% |
| | 5 years | 11 | 6.9% |

Knowledge on surgical wound management

The general mean score of the knowledge was 70.56 (SD = 9.22), which means that the level of knowledge of the participants was average (Figure 1). Most of them (70%) showed average level of knowledge, 28.7% were inadequate knowledge and only 1.2% had adequate knowledge (Table 2).

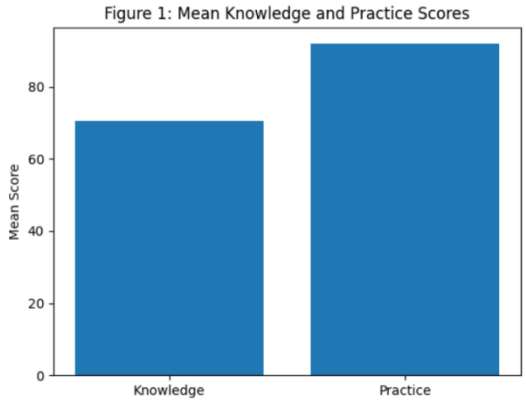


Table 2 – Knowledge and Practice level

| Level | Knowledge (%) | Practice (%) |
|---|---|---|
| Adequate | 1.2% | 92.5% |
| Average | 70.0% | 6.7% |
| Inadequate | 8.7% | 0.7% |

The respondents recorded good knowledge in subjects like sterile technique, causative agents of wound infection, and the importance of nutrition in wound healing. Nevertheless, lower knowledge levels were identified concerning laboratory studies and factors that influence wound healing (Table 3).

Table 3. Factors influenced the wound healing

| Item | Correct Response (%) |
|---|---|
| Sterile saline as cleaning solution | 70.6% |
| Sterile technique for dressing | 97.8% |
| Components of dressing set | 81.3% |
| Role of nutrition in healing | 97.8% |
| Keloid formation | 78.8% |
| Serum albumin as indicator | 85.3% |
| *Staphylococcus aureus* as cause | 95.0% |
| Preoperative hair removal purpose | 81.5% |
| Laboratory test (CRP) | 41.4% |
| Factors affecting healing | 49.4% |

The participants had a high level of practice as the mean practice score was 91.87% (SD = 5.34) (Figure 1). Most of them (92.5%), exhibited adequate practice and 6.7% and 0.7% exhibited average and inadequate practice levels, respectively (Table 2).

It was noted that the respondents had a high compliance with recommended clinical practices especially when it comes to hand hygiene, maintenance of sterile technique, proper application of dressing, and proper disposal of waste materials. Also, majority of the participants always adhered to medical instructions and conducted frequent wound examinations. Yet, the handling of equipment and its transfer to CSSD showed a relatively lower adherence, which means that this area can be improved as well (Table 4).

Table 4. Selected Practice Behaviour

| Practice | Frequency (%) |
|---|---|
| Hand hygiene before procedure | 97.3% |
| Maintain sterile technique | 96.5% |
| Apply dressing as prescribed | 96.0% |
| Check doctor's order | 94.8% |
| Proper waste disposal | 97.3% |
| Assess wound regularly | 84.8% |

| Practice | Frequency (%) |
|---|---|
| Patient education | 84.8% |
| Send equipment correctly to CSSD | 71.8% |

## Discussion

The findings of this study revealed that the level of knowledge about surgical wound management was average for both professional nurses and student nurses, and their practice was adequate. The main knowledge gaps were observed in infection-related investigations and factors responsible for wound healing. However, clinical performance was relatively high, showing a clear gap between knowledge and practice.

The higher level of practice compared to knowledge may be explained by the strong influence of clinical environment, routine protocols, and supervision in hospital settings. Even when their theory knowledge is limited, nurses and student nurses tend to perform wound care and infection control in a standardized manner. This implies that in certain practice settings, clinical practice is more protocol-driven than knowledge-driven.

The results of this study are similar to previous studies reporting moderate or inadequate knowledge levels among nurses despite satisfactory wound care practices. Similar findings have been reported in previous studies, which identified gaps in the knowledge of nurses regarding wound care, even though the clinical performance was satisfactory (20)(21). Another recent study also noted differences in knowledge and practices of nurses, suggesting that better education and training is necessary (16).

The research also indicated that the practice was high particularly in the infection control measures. The same result has been found in other studies where the nurses were found to be adhering well to clinical practices even though they had difficulties in making decisions (22)(23). But the performance in certain areas like equipment handling and CSSD procedures was low. This indicates the need for targeted training in these areas.

Based on the descriptive findings, the practice levels of professional nurses were slightly higher than that of student nurses. This might be attributed to their more extensive clinical experience, experience of surgical wards, and responsibilities in patient care. The difference in level of knowledge between the two groups, however, was not great, implying that theoretical knowledge is comparable, but clinical experience enhances practical performance.

The descriptive results indicated that more experienced nurses reported higher levels of practice than less experienced nurses. Recent studies confirm this fact, noting that clinical experience enhances the quality of decision-making and wound care(24)(25).

From these results, it may be inferred that nursing education and training in the hospital should be improved. Infection prevention, wound assessment and evidence-based practice should be emphasized. There is a need to bridge the gap between theory and practice.

## Strength and limitations

The study strength is that both professional nurses and the final-year nursing students were included, providing a wider knowledge and practice assessment of surgical wound management. In addition, the participants were recruited from multiple hospitals, universities and nurses training colleges of the Western Province to increase the diversity of the study sample.

There are a number of limitations to this study. The cross-sectional design first restricts the capacity to establish cause and effect relationships between knowledge and practice. Second, data were gathered with a self-administered questionnaire that can lead to a bias in responses and an overestimation of good practices. Thirdly, the findings from the study were only applicable to the selected institutions in the Western Province of Sri Lanka, as such, it may not be generalizable to all nurses and student nurses in the country. Lastly, the study failed to use inferential statistics to explore the relationship between knowledge and practice in detail.

Future research should investigate the relationship between knowledge and practice by performing a statistical test. Intervention studies can also be conducted to determine if there is a difference in knowledge and practice after training.

## Conclusion

In this study, it was found that although surgical wound care practices were adequate, professional nurses and student nurses had only average knowledge about surgical wound care. The study identified knowledge gaps in the area of infection assessment and factors influencing wound healing. These findings highlight the need for continuous education, evidence-based training, and strengthening of nursing curricula to improve theoretical knowledge and support high-quality wound care practice.

**Recommendations**

Both nurses and student nurses should undergo regular in-service training and educational programs to enhance knowledge of management of surgical wounds. During clinical practice and training, more attention should be paid to wound assessment, infection diagnosis, and CSSD procedures. Evidence-based practice and supervision should be promoted in healthcare institutions in order to uphold high standards of wound care.

For nursing education, the nursing curriculums must be reinforced with an increased exposure of practical-based learning and new guidelines on wound management. More clinical exposure and supervision should be given to the student nurses in order to enhance their knowledge as well as skills.

For further research, the relationship between practice and knowledge between nurses and student nurses should be investigated in future research. It is advised that interventional studies be done in order to assess the effects of educational and training programs in enhancing knowledge and practice.

**Author Contributions Statement**

B.M.C.N. Basnayaka participated in the study design, data collection, data analysis, and manuscript preparation. A.M.L.P. Adhikari and R.M.H.K.K. Rajapaksha assisted with study design, data collection, and data analysis. Supervision of the study was done by S.P. Senanayaka and R.S. Maddumage. A.R.N. Silva helped to supervise the study and the critical review of the manuscript. The final manuscript was read and approved by all the authors.

**Conflicts of interest**

The authors assert that they do not have any conflict of interest.

**Declaration of Generative AI and AI-Assisted Technologies in the Writing Process**

The authors have applied AI-based editing and clarity tools to the language. The authors reviewed and approved all outputs.

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