

NURSES' KNOWLEDGE ABOUT PREVENTION OF SURGICAL SITE INFECTION

Saberes dos enfermeiros sobre prevenção de infecção do sítio cirúrgico

Conocimiento de enfermeras en la prevención de la infección quirúrgica del sitio

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ABSTRACT: Objective: To understand the experiences of nurses about their practices in preventing surgical site infection (SSI). **Method:** This is an exploratory qualitative study of nurses from the general surgery service of a public hospital in Northeastern Brazil. Between December 2018 and January 2019, a semi-structured interview was conducted for data collection. It was recorded in digital audio and lasted about 20 minutes. We analyzed the transcribed accounts using the Discourse of the Collective Subject technique. **Results:** Nine nurses participated in the study, mostly female, with a mean age of 40.9 years. The following thematic categories were listed: measures to prevent SSIs; adequate nursing care to prevent SSIs; qualified nursing staff; adequate working and material conditions; and ongoing training. **Conclusion:** We identified concern for minimizing risks of SSI in patients through the adoption of preventive actions, such as hand washing, use of personal protective equipment, daily dressing change using the aseptic technique, in addition to the use of adequate supplies, balanced technical-scientific knowledge, and effective team-building. **Keywords:** Surgical wound infection. Surgical wound. Containment of biohazards. Nursing. Perioperative care.

RESUMO: Objetivo: Conhecer as experiências de enfermeiros sobre suas práticas na prevenção de infecção do sítio cirúrgico (ISC). **Método:** Estudo exploratório e qualitativo com enfermeiros da clínica cirúrgica geral de um hospital público do nordeste brasileiro. Entre dezembro de 2018 e janeiro de 2019, realizou-se entrevista semiestruturada, gravada em áudio digital, com duração média de 20 minutos, para coleta de dados. Os depoimentos transcritos foram avaliados pela técnica de análise do discurso do sujeito coletivo. **Resultados:** Participaram nove enfermeiros, a maioria do sexo feminino, com idade média de 40,9 anos. Elencaram-se as seguintes categorias temáticas: medidas de prevenção contra ISC; assistência de enfermagem adequada na prevenção de ISC; equipe de enfermagem capacitada; adequadas condições de trabalho e de materiais; e treinamento contínuo. **Conclusão:** Observou-se preocupação em minimizar os riscos de ISC de pacientes por meio da adoção de ações preventivas, como lavagem das mãos, uso de equipamentos de proteção individual, troca de curativos diários com técnica asséptica, além do uso de insumos adequados, conhecimento técnico-científico harmonioso e estímulo do relacionamento eficaz entre a equipe. **Palavras-chave:** Infecção da ferida cirúrgica. Ferida cirúrgica. Contenção de riscos biológicos. Enfermagem. Cuidados perioperatórios.

RESUMEN: Objetivo: Conocer las experiencias de las enfermeras sobre sus prácticas en la prevención de la infección del sitio quirúrgico (ISQ). **Método:** estudio exploratorio y cualitativo con enfermeras de la clínica quirúrgica general de un hospital público en el noreste de Brasil. Entre diciembre de 2018 y enero de 2019, se grabó una entrevista semiestructurada, grabada en audio digital, con una duración promedio de 20 minutos, para la recopilación de datos. Los testimonios transcritos se evaluaron utilizando la técnica de análisis del discurso del sujeto colectivo. **Resultados:** participaron nueve enfermeras, la mayoría mujeres, con una edad promedio de 40,9 años. Se enumeraron las siguientes categorías temáticas: medidas preventivas contra SSI; asistencia de enfermería adecuada para prevenir SSI; equipo de enfermería capacitado; condiciones adecuadas de trabajo y materiales; y entrenamiento continuo. **Conclusión:** se observó preocupación por minimizar los riesgos de ISQ de los pacientes mediante la adopción de acciones preventivas, como el lavado de manos, el uso de equipos de protección personal, el intercambio de vendajes diarios con una técnica aséptica, además del uso de suministros adecuados, conocimiento armonioso técnico-científico y estimulando la relación efectiva entre el equipo. **Palabras clave:** Infección de la herida quirúrgica. Herida quirúrgica. Contención de riesgos biológicos. Enfermería. Atención perioperativa.

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INTRODUCTION

Healthcare-associated infections (HAIs) are regarded as a serious risk to the health of hospital users, contributing to increased mortality, hospital length of stay, and costs in these institutions. In Brazil, the first ministerial decrees that prioritized control and prevention of hospital infections were published in the 1980s¹.

Among the HAIs, surgical site infections (SSIs) stand out as one of the main complications associated with surgical procedure, ranging from 14 to 16%¹. Risk factors include length of preoperative hospital stay over 24 hours, duration of surgery, potential for surgical wound contamination, classification of patient's clinical status (American Society of Anesthesiologists' — ASA — Classification of Physical Status)², obesity, smoking, diabetes mellitus, and use of steroids, immunosuppressants, among others¹.

Once installed, the infection may cause major socio-economic burdens due to rising morbidity and care costs, given the increase in the length of stay, associated antibiotic therapy, subsequent surgeries for tissue reconstruction, in addition to the patient's extended period out of work and family activities^{2,3}.

The staff that provides perioperative care for the patient is responsible for minimizing surgical complications. It is possible to prevent most of these adverse events by following recommended and validated actions; thus, ensuring the patient's safety throughout the hospital stay³. Among the recommendations adopted to prevent and control SSIs are the standard precautions (SPs), taken whenever there is a risk of contact with the patient's blood and body fluids, regardless of risk factors or underlying disease^{4,5}.

Among the SPs, we highlight the correct hand hygiene before and after the procedure; use of gloves to reduce contamination from microorganisms, as well as change the gloves between procedures; use of gowns and masks or facial protection to avoid contact with patient fluids, such as blood, body fluids, secretion and excretion (except sweat), non-intact skin, and mucous membranes; and prevention of accidents with biological material³.

Implementing SPs in the health staff professional routine requires technical knowledge of the subject. Thus, this matter should be frequently discussed, and adherence to it encouraged. We underline the importance of nursing staff

participation in the SSI prevention process, since they provide direct care to the patient⁶.

Nurses should evaluate predisposing and risk factors for infection and adopt preventive and educational measures for all involved through a collective awareness process, which may contribute to reducing the incidence of this post-surgical complication³.

Considering that nurses plan, manage, and assess the care provided, it is necessary to evaluate the activities and measures implemented by this professional for proper SSI control, as well as for promoting patient safety.

OBJECTIVE

To understand the experiences of nurses about their practices in preventing SSIs.

METHOD

This is exploratory and descriptive research, with a qualitative approach, developed in the general surgery service unit of a large public hospital that performs about 800 emergency and elective surgeries per month, in the city of Recife, Pernambuco, Brazil.

Individuals were invited to take part in the investigation according to the following inclusion criteria: being a nurse and having experience of at least six months in surgical patient care. We excluded professionals on medical leave, maternity leave, or vacation.

Data were collected in December 2018 and January 2019, from semi-structured individual interviews. The following guiding questions were asked:

- What do you understand by SP measures?;
- What are the priority actions you perform to prevent SSIs?;
- What are the facilities for developing your actions?;
- What are the difficulties for developing your actions?;
- What steps do you take to get your staff to establish prevention criteria?

The interview was conducted in a private room without interruptions. It lasted about 20 minutes and was recorded in digital audio. Sample closure occurred by saturation, that is, when there was no new information in the accounts.

We identified the participants by the letter E, followed by Arabic numbers in the order of the interviews (E1, E2, E3...) to ensure anonymity. The transcribed data were evaluated with the Discourse of the Collective Subject (DCS) technique, which uses methodological figures (keywords and central ideas), grouping individual statements with similar meanings to categorize and aggregated them into a synthesis discourse written in the first person singular, representing the idea of collective⁷. We used the software Qualiquantisoft[®] to tabulate data⁸.

All nurses signed the Informed Consent Form (ICF), and the research project was submitted to and approved by the Research Ethics Committee (Report No. 3,105,257), complying with the Resolution No. 466/2012 of the National Health Council.

RESULTS

The sample consisted of 9 on-call nurses (6 working the day shift and 3 working the night shift), 7 of them females, with a mean age of 40.9 years. The time since graduation ranged from 1 to 29 years. All participants worked in more than one institution, with a mean workload of 42.22 hours per week, and were undergoing training.

Three nurses participating in the research had only undergraduate nursing education. Regarding *lato sensu* courses, the nurses had specializations in Family Health (3 nurses), Emergency (2), Administration of Health Services (2), Occupational Health Nursing (1), Nephrology (1), Health Education (1), Pediatrics (1), Surgery (1), and Obstetrics (1). It is noteworthy that some interviewees had more than one graduate degree, and only one specialized in the surgical field.

Six categories associated with good SSI control practices emerged from the analysis of the interviews based on DCS. Next, we present each of the discourses formulated, the respective discussions, and the central idea (CI).

CI1/DCS1: Measures to prevent surgical site infections

When answering about the concept of SP measures, nurses defined hand washing and use of personal protective equipment (PPE) as main actions to prevent infection, making the following discourse:

These are measures that every health professional should take to prevent contamination by bacteria that, in contact with the patient, leads to infections. I must always, as a norm, wash my hands before and after the procedure; use PPE such as mask, gloves, glasses, surgical gown, and surgical cap.

CI2/DCS2: Adequate nursing care to prevent surgical site infections

Regarding the priority actions performed in SSI prevention, nurses highlighted hand washing, daily dressing change using the aseptic technique and appropriate materials, as well as teaching self-care to patients:

As priority actions to prevent infections, I wash my hands before and after procedures. I clean and change the surgical wound dressing daily and whenever necessary, using appropriate materials and the proper technique. I guide the patient and their companion about hygiene. I perform maintenance of drains and probes.

The question about the facilities found in developing preventive actions led to the identification of two thematic categories, as described below.

CI3/DCS3: Qualified nursing staff

Interviewees pointed out that the nursing role in preventing SSI is based on teamwork. They also reported the relevance of their technical knowledge in providing care, as expressed in the discourse:

I believe that knowledge is the greatest facility, knowing my work and the procedures. Having a whole staff focused on one purpose and enjoying doing what they do.

CI3/DCS4: Adequate material resources for care

With respect to the quality of care, nurses also underlined enough materials as facilitators of their actions:

Having the proper material in adequate quantity for the procedure makes things easier. Sometimes we do not see the evolution of surgical wound healing due to the shortage of products such as solutions, ointments, and special dressings. These products really make our work and precautionary measures easier.

CI4/DCS5: Adequate working and material conditions

Regarding difficulties in the performance of their actions, interviewees reported that the lack of materials makes it impossible to provide adequate care and that, in this situation, the professional tends to use inappropriate materials. Poor communication among sectors was indicated as another harmful factor for care development:

Lack of materials is the greatest obstacle because it makes our actions concerning patient care very difficult. Very often, we must improvise, find a way, because there may be a lack of water, soap, and paper towel for hand washing, for example. Lack of communication among professionals from various sectors (pharmacy, warehouse, [Central Sterile Supply Department] CSSD, [Hospital Infection Control Committee] HICC, among others) also affects the actions.

CI5/DCS6: Ongoing in-service training

With respect to the measures established so the staff can prevent SSIs, participants emphasized the importance of dialog as a tool to encourage staff adherence. This communication consists of exchanging information and experiences. Training and the use of digital technology were considered allies in SSI prevention:

I usually use dialog and the exchange of information and experience among employees to improve knowledge; and, thus, put into practice our infection prevention and control action plans. I undergo training, and whenever I have questions, I search on the Internet about the case and pass on the information to the staff. Many people resist using protective equipment, but what I can do is remind employees to

protect themselves and their patient. In private health services, you are punished if you do not use the equipment. However, in public service, there is no punishment; there is no supervision.

DISCUSSION

Surgical procedures are widely performed in hospitals. Despite all progress in research and technology, surgical treatments offer risks to the patient⁹. SSIs have a high cost due to the increase in surgical interventions and the complexity of these patients. Studies indicate that SSIs can be reduced if the actions established in protocols and norms of institutions are evidence-based¹⁰.

SP measures are taken to control HAIs. In this study, SPs were defined as actions aimed at preventing bacterial contamination that lead to infections through contact with the patient. The professional must be properly clothed, wearing a mask, gloves, glasses, surgical gown, and surgical cap. Other studies corroborated this definition and emphasized that professionals should routinely take these measures in patient care^{6,11,12}.

Hand washing before and after procedures was listed as the priority action in infection control. Considering that the hands of health professionals are the main responsible for the dissemination of microorganisms; sanitizing them is a simple and effective measure, with a good cost-benefit ratio, to prevent HAIs^{13,14}. By adhering to these measures, the professional contributes to the development of the healthcare quality, favoring the reduction in morbidity and mortality¹². Dressing change and adequate management of probes and catheters were other actions reported.

These results demonstrate that the actions of nurses are general, ignoring the specificities of each operative period. We found that professionals have a fragmented knowledge about factors that may lead to postoperative complications associated with the pre- and intraoperative periods, and which may be connected to an unsatisfactory approach during their academic studies, as well as the lack of ongoing training¹⁵.

Only one nurse in the sector had a specialization in the surgical field, which may reveal a culture of underusing specialists in different sectors, since this professional would be more suitable – in a matter of specific knowledge – to deal with

characteristic work relations related to surgical patient care. The specialist is able to quickly and safely master common or unexpected situations with proactivity and effectiveness¹⁶.

A study conducted in a public referral school hospital identified SSI risk factors related to the preoperative period, such as smoking, alcohol consumption, hypertension, and diabetes, which should be controlled before the surgery¹⁵. Regarding the intraoperative period, procedures classified as clean-contaminated and clean surgeries were indicated as those with the highest prevalence of SSI, in addition to prolonged surgical period and the use of drains. Finally, the measures listed to reduce infections in the postoperative period were the fluid culture examination, management of drains and dressings, and adequate control of comorbidities¹⁵.

Among the facilitating factors, the participants mentioned technical knowledge associated with teamwork and adequate materials as important in achieving effective care and ensuring patient safety. Considering that nurses manage interventions performed by the nursing staff, the professional must have theoretical-practical and technical-scientific knowledge. In addition to these factors, it is important to show initiative, interest, persistence, and leadership. All these characteristics are of paramount importance for quality care¹⁷.

Other facilitating factors for quality care, not reported by the nurses, are standard protocols and routines adapted for the service and the promotion of patient safety culture through continuing education, as both contribute to reducing adverse events^{18,19}. We also underline the active participation of the HICC in the development of these actions¹⁹.

As to difficulties, the nurses pointed out the lack of materials as harmful to the care. Unstable environments have a negative influence on the activities performed by professionals and cause stress associated with dissatisfaction at work. Inadequate working conditions impair the work routine, overloading the nurse, who, consequently, gives direct patient care a low priority¹⁸. A study points out that nursing professionals are exposed to several occupational risks regarding structures, equipment, physical space, and the limited number of workers²⁰.

The nurses also declared that poor communication is a barrier to providing care. In order to properly develop SSI prevention and control actions, professionals should establish effective communication among the several sectors of the hospital environment. Other studies have indicated an insufficient number of professionals, the absence of lectures

and courses, and a lack of care standardization and epidemiological surveillance as factors that contribute to the increase in infections^{18,19}.

The nurse's performance in the nursing staff was considered a relevant factor. The care staff is essential in infection control, since they provide care to the patient throughout the hospitalization. Prevention requires that all involved perform actions based on evidence³.

The educational methods reported, such as training, dialog, exchange of experiences, and use of technological innovations from the Internet, contribute to quality care. By analyzing risk factors, nurses can actively act in the prevention of SSIs, using educational methods so that everyone involved adopt preventive measures, thus, reducing this severe complication. The challenge lies in professionals taking responsibility in the process of reducing infections, since they are still resistant to adhere to safe and validated practices³.

The limitations of the study relate to the answers given by nurses, which may have been briefer because the interview occurred during working hours, and the professionals might have been concerned about compromising their work due to the time used to answer.

FINAL CONSIDERATIONS

The development of this study made it possible to understand the experiences of nurses from a public referral hospital, in Northeastern Brazil, in preventing SSIs. The actions listed by professionals about their SSI control practices were hand washing, use of PPE, change of dressings, use of adequate supplies, technical-scientific knowledge, and good teamwork.

Nurses, as well as their staff, play an important role in properly preventing HAIs, specifically of SSIs, and ensuring patient safety. Adequate care demands technical knowledge, with actions based on scientific evidence.

We found that nurses suffer due to weaknesses associated with the service structure and the lack of theoretical foundation. It is crucial to promote patient safety culture. As a consequence, it will be possible to distinguish the probable causes and allow reflections by the nursing staff, who, consequently, will adopt measures to prevent infections and reduce errors.

We suggest deepening the theme, based on scientific evidence, in nursing care practice in surgical units.

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