CAN NURSING ACTIONS PREVENT SURGICAL WOUND DEHISCENCE?

Ações de enfermagem podem prevenir deiscência em ferida operatória?

¿Pueden las acciones de enfermería prevenir la dehiscencia de la herida operatoria?

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ABSTRACT: Objective: To identify useful nursing interventions for preventing Surgical Wound Dehiscence in scientific literature. **Method:** This is an integrative literature review, guided by the question: *are there nursing actions that can contribute to the prevention of surgical wound dehiscence?* The search was carried out in March 2019, including articles published from 1990 to 2018. We used the following databases and/or portals to select the articles: National Library of Medicine (PubMed); Web of Science; Scopus Info Site (Scopus); Latin American and Caribbean Health Sciences Literature (LILACS), and Cumulative Index to Nursing and Allied Health Literature (CINHAL). **Results:** The search resulted in 64 articles. We excluded four of them for being duplicates, and another 40 that did not meet the inclusion criteria (24 were about treatment, 13 due to the nature of the article, two were not available, and one was in French). Twenty articles were fully evaluated, and 14 were excluded because they did not answer the guiding question of this review. Thus, at the end of this analysis process, we selected six articles that met the inclusion criteria and constituted the final sample. **Conclusion:** The nursing production on the subject was scarce. The main nursing actions for preventing surgical wound dehiscence are associated with the prevention of surgical site infections and the indication and use of negative pressure wound therapy.

Keywords: Surgical wound. Surgical wound dehiscence. Surgical wound infection. Perioperative nursing. Perioperative care.

RESUMO: Objetivo: Identificar na literatura científica intervenções de enfermagem úteis para a prevenção de Deiscências em Feridas Cirúrgicas. **Método:** Trata-se de uma revisão integrativa da literatura, norteada pela pergunta: *Há ações de enfermagem que possam contribuir para prevenção de deiscência em ferida operatória?* Realizou-se a busca no período de março de 2019, incluindo artigos publicados a partir do ano de 1990 até 2018. Para a seleção dos artigos foram utilizadas as seguintes bases de dados e/ou portais: National Library of Medicine (PubMed); Web of Science; Scopus Info Site (Scopus); Literatura Latino-Americana e do Caribe em Ciência da Saúde (LILACS) e Cumulative Index to Nursing and Allied Health Literature (CINHAL). **Resultados:** A busca resultou em 64 artigos, excluíram-se quatro por estarem duplicados e 40 por não atenderem aos critérios de inclusão (24 por serem sobre tratamento, 13 pela natureza do artigo, dois por não estarem disponíveis e um por ser em francês). Vinte artigos foram avaliados na íntegra e 14 foram excluídos por não responderem à questão norteadora desta revisão. Dessa maneira, ao fim desse processo de análise, foram selecionados seis artigos que responderam aos critérios de inclusão e constituíram a amostra final. **Conclusão:** Houve pouca produção da enfermagem sobre o tema. As principais ações de enfermagem para prevenção de deiscência em feridas cirúrgicas estão associadas à prevenção de infecções de sítio cirúrgico e à indicação e à utilização de terapia de cobertura a vácuo.

Palavras-chave: Ferida cirúrgica. Deiscência da ferida operatória. Infecção da ferida cirúrgica. Enfermagem perioperatória. Assistência perioperatória.

RESUMEN: Objetivo: identificar en la literatura científica intervenciones de enfermería útiles para la prevención de la dehiscencia en heridas quirúrgicas. **Método:** Esta es una revisión de literatura integradora, guiada por la pregunta: ¿Existen acciones de enfermería que puedan contribuir a la prevención de

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la dehiscencia en las heridas quirúrgicas? La búsqueda se realizó en el período de marzo de 2019, incluidos los artículos publicados de 1990 a 2018. Para la selección de artículos, se utilizaron las siguientes bases de datos y/o portales: National library of Medicine (PubMed); Web of Science; Scopus Info Site (Scopus); Literatura latinoamericana y caribeña de ciencias de la salud (LILACS) y Cumulative Index to Nursing and Allied Health Literature (CINHAL). **Resultados:** La búsqueda resultó en 64 artículos, se excluyeron cuatro duplicados, 40 artículos por no cumplir con los criterios de inclusión (24 sobre el tratamiento, 13 por la naturaleza del artículo, dos por no estar disponibles y uno por estar en francés), y 20 los artículos fueron evaluados en su totalidad y 14 fueron excluidos porque no respondieron la pregunta guía de esta revisión. Por lo tanto, al final de este proceso de análisis, se seleccionaron seis artículos que cumplían los criterios de inclusión y constituían la muestra final. **Conclusión:** hubo poca producción de enfermería sobre el tema. Las principales acciones de enfermería para prevenir la dehiscencia en las heridas quirúrgicas están asociadas con la prevención de infecciones del sitio quirúrgico y la indicación y el uso de la terapia de cobertura con vacío.

Palabras clave: Herida quirúrgica. Dehiscencia de la herida operatoria. Infección de la herida quirúrgica. Enfermería perioperatoria. Atención perioperativa.

INTRODUCTION

Surgical wound dehiscence (SWD) is a postoperative complication that impairs wound healing and increases the length of stay and hospital costs[1-3]. It can be defined as a separation of the edges of a closed wound after a surgical procedure, which usually occurs up to 10 days after surgery, although it may occur until the 30th day[4,5].

The incidence of SWD varies according to the surgical procedures, such as abdominal procedures (1.3 to 4.7%), cesarean sections (13.3%), hip replacements (14.3%), and cardiothoracic surgeries (15.3%)[1]. SWD is associated with an increase in morbidity, mortality, and risk factors[6].

Healing after dehiscence is slower, and the patient may need a new surgical intervention. In general, SWD is caused by technical factors (choice of thread, incision, and suture technique), mechanical stress (cough, abrupt or vigorous movement), and problems related to the natural healing process[7]. Surgical wound healing involves a combination of factors such as oxygenation and perfusion of the wound bed, and intake of nutrients, which can be impaired by local edema, infection, and skin conditions, such as aging and changes caused by diabetes[7,8].

Surgical site infection (SSI) is related not only to dehiscence but also to the appearance of incisional hernias[9]. In addition to the connection with SSI, dehiscence may be associated with non-infectious causes (e.g., hematoma or seroma), patients-related factors (e.g., obesity and diabetes), and mechanical stress (e.g., trauma, vomit, and coughing spells)[2,4,10]. Moreover, even when the cause is not infectious, an infection may occur after dehiscence, making the healing process more difficult[2,7,8].

Studies aimed at developing and validating a risk model for SWD described the following independent risk factors as being more recurrent: advanced age, biological female gender, chronic lung disease, edema, ascites, anemia, emergency surgery, type of surgery, postoperative cough, smoking, and infection, besides the direct relationship between a greater presence of risk factors and a higher chance of death[4,11]. Evidence shows a higher incidence of dehiscence when, in addition to the surgical wound, there are stomata[12,13].

Considering the impact of surgical dehiscences on postoperative care, research in this area should try to understand how to prevent it, as well as develop technologies that promote prevention. In particular, nurses are responsible for corroborating the construction of this knowledge, since they act directly on perioperative care and postoperative wound care.

OBJECTIVE

To identify, in national and international scientific literature, useful nursing interventions for preventing SWD.

METHODOLOGY

This study is an integrative literature review, a research method that uses evidence-based practice, summarizes the available articles on a determined subject, and allows scientific knowledge to guide the practice[14].

This study followed the expected stages of an integrative review: identification of the theme and elaboration of the guiding question, search of the literature using inclusion and exclusion criteria, definition of the information to extract from the selected studies based on a previously constructed bibliographic data, data collection, evaluation and critical analysis of the studies included in the review, discussion of results, and submission of the integrative review[14].

The search was guided by the following question: *are there nursing actions that can contribute to the prevention of surgical wound dehiscence?* The search was carried out in March 2019 and included articles published from 1990 to 2018, taking into account that in the 1990's the number of gastrointestinal surgeries increased significantly, especially bariatric surgeries. We used the following databases and/or portals to select the articles: National Library of Medicine (PubMed), Web of Science, Scopus Info Site (Scopus), Latin American and Caribbean Health Sciences Literature (LILACS), and Cumulative Index to Nursing and Allied Health Literature (CINHAL).

The inclusion criteria were: articles published in Portuguese, English, and Spanish, reporting evidence on the prevention of SWD. The exclusion criteria were: studies about other surgical complications (such as granuloma and seroma) and articles that did not address the objective of this review (articles, editorials, and letters to the editor on dehiscence treatment).

For the search, we selected the following keywords from the Health Sciences Descriptors (*Descritores em Ciências da Saúde* – DeCS) and the Medical Subject Headings (MESH): surgical wound dehiscence, postoperative complications, and nursing. Due to the characteristics of access to the selected databases, strategies were combined in different ways to conduct a broad search, using the study question and the inclusion criteria previously established as guiding paths (Chart 1).

Two evaluators with experience in review studies participated in all stages of assessment of the articles found in the search and reached a consensus for their inclusion. A first evaluation of the articles was performed taking into account the title and the abstract. For data collection and analysis, we elaborated an instrument containing the following items: article title, journal name, authors, country, language, year of publication, type of study, objective, study population, study period, intervention, evaluation method, statistical analysis, result, and conclusion. We organized the references found using the software EndNote™ web version.

The assessment of the studies was qualitative. For the methodological evaluation of the selected studies, we adopted the Joanna Briggs Institute levels of evidence for effectiveness[15]. The Results section presents a synthesis of the articles in a synoptic table containing the following characteristics: author/year, journal, title, design, result, and level of evidence (Table 2).

Chart 1. Database/portal search strategies.

Database	Search strategy
Medline via PubMed	("Surgical Wound Dehiscence"[Mesh] OR "Surgical Wound Dehiscence"[tw]) AND ("Nursing"[Mesh] OR "Nursing Care"[Mesh])
Scopus	("Surgical Wound Dehiscence" AND ("Postoperative Complications" OR "Postoperative Complication") AND (Nursing OR "Nursing Care")
Web of Science	TOPIC: ("Surgical Wound Dehiscence" AND Nursing OR "Nursing Care")
LILACS	mh: ("Deiscência da Ferida Operatória/NU")*
CINAHL	(MH "Surgical Wound Dehiscence/NU")

PubMed: National Library of Medicine; LILACS: Latin American and Caribbean Health Sciences Literature; CINAHL: Cumulative Index to Nursing and Allied Health Literature. *Surgical Wound Dehiscence/NU.

Chart 2. Corpus of analysis selected. Articles selected as the sample of the study, according to authors, year of publication, journal, title, design, result, and level of evidence.

Author (Year)	Journal	Title	Design	Result	Level of evidence
Sandy-Hodgetts et al., 2016[1]	Journal of Wound Care	Surgical wound dehiscence in an Australian community nursing service: time and cost to healing	Descriptive and costing analysis	55% of dehiscences (N=70) associated with infection and an increase of 67% in total cost.	3e r(Observational study without a control group)
Stannard et al., 2012[2]	International Wound Journal	Use of negative pressure wound therapy over clean, closed surgical incisions	Literature review and case series	Positive results in open wounds point to a promising use of negative pressure wound therapy in surgical wounds.	3b (Systematic review that includes cohorts and smaller studies)

Continue...

Chart 2. Continuation.

Author (Year)	Journal	Title	Design	Result	Level of evidence
Scalise et al., 2016[16]	International Wound Journal	Improving wound healing and preventing surgical site complications of closed surgical incisions: a possible role of Incisional Negative Pressure Wound Therapy: a systematic review of the literature	Systematic review	The literature showed that negative pressure wound therapy reduced the incidence of infection, sero-hematoma formation, and reoperation rates. A lower level of evidence on dehiscences was found, and the relationship between negative pressure wound therapy and dehiscences was inconclusive.	2b (Systematic review that included even quasi-experimental studies)
Sandy-Hodgetts and Watts, 2015[17]	JBI Database System Rev Implement Rep	Effectiveness of negative pressure wound therapy/ closed incision management in the prevention of post-surgical wound complications: a systematic review and meta-analysis	Systematic review	There is evidence of the relationship between negative pressure wound therapy and infection decrease, but no direct evidence of the same association with surgical wound dehiscence.	1b (Systematic review of clinical trials and other studies)
Petito et al., 2014[18]	Journal of Clinical Nursing	The influence of the initiation of an exercise programme on seroma formation and dehiscence following breast cancer surgery	Randomized clinical trial	Women who initiated the rehabilitation exercise programme early (before drain removal) had no different outcomes.	1c (Randomized clinical trial)
Blume et al., 2010[19]	International Wound Journal	Retrospective evaluation of clinical outcomes in subjects with split-thickness skin graft: comparing V.A.C.® therapy and conventional therapy in foot and ankle reconstructive surgeries	Retrospective descriptive	Negative pressure wound therapy was associated with fewer complications (seroma, hematoma, and infection) in skin grafts.	3c (Cohort study with a control group)

RESULTS

The search of the selected databases resulted in 64 articles, of which four were excluded for being duplicates, and 60 remained. After reading the titles and abstracts, we removed 40 articles that did not meet the inclusion criteria (24 were about treatment, 13 because of the nature of the article, two were not available, and one was in French). Consequently, 20 articles remained. Among them, 14 were fully evaluated and excluded because they did not answer the guiding question of this review. Thus, at the end of the analysis process, we selected six articles that met the inclusion criteria and constituted the final sample. Figure 1 describes the process of selecting and including the articles.

Only six articles comprised the corpus of analysis, all of them in English, and published as of 2010, as presented in Chart 2. The articles show evidence of the association of dehiscences with infections, early-onset of rehabilitation exercises (before the removal of the drains), and use of negative pressure wound therapy.

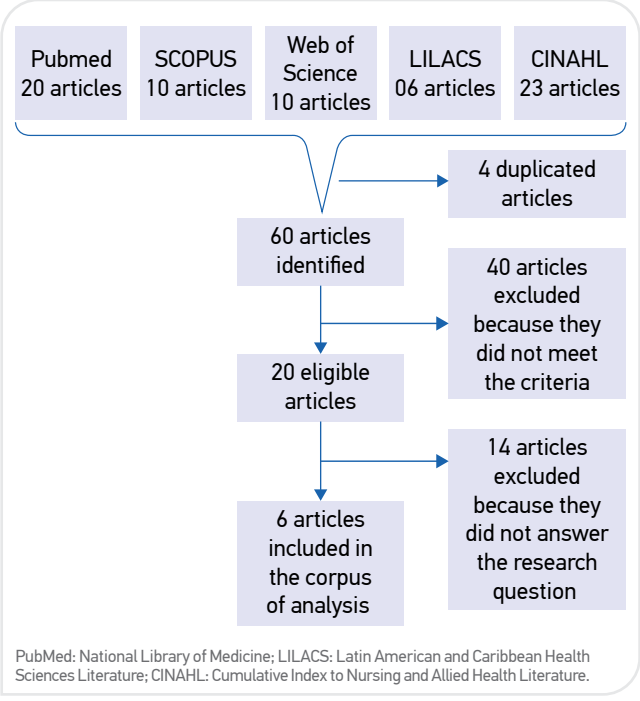

Figure 1. Flow chart of the selection of articles that composed the corpus of analysis.

DISCUSSION

By crossing the keywords, the low nursing scientific production on the subject became clear. In addition, the articles identified did not directly address strategies for preventing surgical dehiscence. One of the reviews was not included because its method was not sufficiently described. The review not included showed that the early detection of signs of infection and seroma, as well as early intervention, are crucial for stoma maintenance[13]. The other reviews included concluded that negative pressure wound therapy reduces the incidence of infections, but pointed out that evidence of the lower prevalence of dehiscence associated with the use of this method as a prophylactic measure was not sufficient[2,16,17].

The most common method for closing clean surgical wounds is the combination of suture with gauze as primary dressing; however, adhesive tapes, staples, hydrocolloids, and other more advanced devices are available in the market[2]. For wounds with edges that cannot be pulled together for traditional closure or cases of dehiscence, negative pressure wound therapy has been increasingly used with good results[2].

We consulted other references to answer the guiding question. The World Union of Wound Healing Societies (WUWHS) published a consensus in 2018 on improving the prevention and outcomes of SWD, which presents its risk factors, classifying them into patient-related, pre-, intra-, and postoperative factors[20]. After analyzing the risk factors presented in the document, it is possible to affirm that nurses can directly collaborate to preventing dehiscences by avoiding hypothermia, mechanical stress – instructing the patients on coughing and postoperative efforts –, and SSI, as well as by timely removing the suture[20]. Only one of the articles found correlated SSI with SWD.

Nonetheless, other references that evaluated risk factors indicated SSI as an important one[1,21-23].

In the preoperative period, nurses should consider using an instrument to assess the risk of SSI and SWD, in addition to elaborating educational interventions for patients on postoperative self-care related to wounds, drains, coughs, and efforts. Indirectly, all preoperative actions to avoid SSI impact dehiscence prevention[20-23].

In the intraoperative period, nurses, even if they are not in the operative field, can collaborate by supervising adherence to aseptic techniques, ensuring that they are followed in all stages, by observing and demanding the adequate performance of procedures, from skin preparation to the change of gloves for the closure of the surgical wound[20].

The nurse also helps to dress the surgical wound. The moment of dressing the wound is crucial and may be opportune for the identification of other skin lesions resulting from the intraoperative period[24]. We found no studies about this theme, besides the research with negative pressure wound therapy; however, nurses should investigate whether there are more effective types of dressing, evaluating new technologies or old techniques usually observed in surgery centers, such as cryotherapy and the use of bandages and belts to increase tension in chest wounds and the abdominal wall, respectively. Nursing research might answer whether these techniques and other technologies can reduce the incidence of dehiscence. The WUWHS consensus recommends the dressing of surgical wounds for at least 48 hours unless stricter monitoring of early signs and symptoms is necessary[20]. Cryotherapy studies are more related to pain relief than the prevention of infection or dehiscence[22].

Regarding early exercises, one of the articles in the corpus of analysis showed that patients with drains did not have worse results than those who had theirs removed. Although its level of evidence is not good, it may indicate, for nursing, the need for further research on early ambulation in order to confirm it as a protective factor in the intraoperative period[18].

The current guideline of the World Health Organization for the prevention of SSI presents evidence of the association of hypothermia with SSI and SWD, in addition to parameters for interventions aiming at the prevention of perioperative hypothermia[25].

After synthesis of evidence, the WUWHS consensus suggests using the negative pressure wound therapy before the patient leaves the operating room to prevent dehiscence whenever they present a major risk factor (body mass index ≥40 kg/m^2, diabetes mellitus, and procedures with a high incidence of dehiscence) or two or more moderate risk factors[20].

CONCLUSION

The search of the literature revealed that the nursing contribution to academic research on the subject is scarce, since we found few articles, and their level of evidence was moderate.

Based on studies and references which corroborated the discussion about the findings, we can affirm, in response to the initial questioning of this review, that the main nursing actions for preventing SWD relate to the prevention of SSI and the indication and use of negative pressure wound therapy. Other types of dressing should be researched, as well as the use of bands, belts, and dressings that increase tension on the surgical wound.

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