Nursing Interventions for the Prevention of Surgical Site Infections in Post-Operative Care

A Literature Review

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Bachelor's thesis
November 2021
Healthcare and Social Studies
Degree Programme in Nursing
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**Type of publication**
Bachelor’s thesis

**Date**
November 2021

**Number of pages**
26

**Language of publication:**
English

**Permission for web publication:**
X

**Title of publication**
Nursing Interventions for the Prevention of Surgical Site Infections in Post-Operative Care
A Literature Review

**Degree programme**
Nursing

**Supervisor(s)**
Sinivuo, Riikka

**Assigned by**
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**Description**
Surgical Site Infections (SSI) are infections that start from the surgical wound within 30 or 90 days of the procedure. They are the second most prevailing healthcare associated infection in Europe and can increase the length of stay of a patient and costs of treatment. The nurse’s role is to ensure patients safety by providing quality care when handling surgical wounds. There is a lack of understanding of the different types of SSI, infection preventative measures and nursing interventions; identifying these areas helps to develop new educational tools.

The aim of the study was to collect evidence based information on how to prevent surgical site infections.

The literature review was centred on nursing interventions that tackle wound infection in post-operative care of adult patients. The studies included were peer reviewed, written and published from 2011 onwards. Eight articles were selected for the study. Data extraction was done through inductive content analysis.

The information available on post-operative wound care for infection prevention was scarce and had little evidence to support the efficiency against infections. Studies reveal as well the link between poor information and poor nursing performance.

More studies and investigations need to be performed to gather enough evidence based information regarding wound care. A general guideline for interventions should be established and nurses should invest time in learning about the wound healing process and wound care.

**Keywords**
Post-operative, wound care, infection prevention, surgical site infection.
1. Introduction

In estimation, the number of patients that undergo some kind of surgical procedure is between 187.2 and 281.2 million (Weiser, Regenbogen, Thompson, Haynes, Lipsitz, Berry, Gawande 2008, 142). That means that about 4% of the global population needs post-operative care. This kind of care focuses on monitoring patient status, their vitals signs, nutritional intake, fluid balance, pain management, prevention and management of nausea or vomiting, encouragement of the patient to mobilise, promotion of recovery and, the topic this study focuses on, wound care and management (Le May 2015, 29).

One of the most common incidences in post-operative wound care are Surgical Site Infections (SSI), with some studies suggesting that approximately between 2 and 5% of patients develop an SSI after surgery (Leaper, Van Goor, Reilly, Petrosillo, Geiss, Torres, Berger 2004, 269); and other studies indicating that during a three year range, 38% of patient deaths after contracting an SSI were directly related to the infection (ibid., 247). There are three types of SSI, but in general they can be defined as infections occurring in or around a surgical wound, after 30 days of the surgical procedure. (Diaz, Newman 2015, 63)

Studies show that healthcare professionals lack the knowledge and resources to properly apply effective, evidence based interventions (Mert Boga 2019, 1230). This literature review aims to gather evidence based information about post-operative nursing interventions that prevent SSIs, focusing primarily on adult patients.
2. Background

2.1 Surgical Site Infections

A Surgical Site Infection (SSI) is an infection that starts from a surgical wound. Depending on the type of incision and tissues affected SSIs can be classified in three categories. A SSI that affects only epithelial and subcutaneous tissue is denominated as a Superficial Incisional SSI. Deep incisional SSI occurs in deeper tissues such as fascia and muscle tissues, and are differentiated by two types: Deep Incisional Primary, where the infection is found in a primary surgical wound in an operation with one or more openings; and Deep Incisional Secondary, where the infected incision is a secondary surgical wound. The third type are Organ/space SSI, which happen when the infection develops in structures that are deeper than fascia and muscle tissues. In the following table the main characteristics of the three types can be identified. (National Healthcare Safety Network 2021)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Superficial Incisional SSI</th>
<th>Deep Incisional SSI</th>
<th>Organ/Space SSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset</td>
<td>Within 30 days of the creation of the surgical wound</td>
<td>Within 30 or 90 days of the creation of the surgical wound</td>
<td>Within 30 or 90 days of the creation of the surgical wound</td>
</tr>
<tr>
<td>Localization</td>
<td>Epithelial and subcutaneous tissue</td>
<td>Deep soft tissues (fascia, muscle)</td>
<td>Any part of the body deeper than fascia/muscle involved in the surgery</td>
</tr>
<tr>
<td>Signs</td>
<td>- Purulent drainage from the incision</td>
<td>- Purulent drainage from the incision</td>
<td>- Purulent drainage from a drain placed in the organ/space</td>
</tr>
<tr>
<td></td>
<td>- Localized pain or tenderness</td>
<td>- Localized pain or tenderness</td>
<td>- Abscess or other evidence of infection discovered during examinations</td>
</tr>
<tr>
<td></td>
<td>- Localized swelling</td>
<td>- Fever</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Erythema</td>
<td>- Abscess or other evidence of infection discovered during examinations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Heat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Testing</td>
<td>Identification of organisms from the incision or</td>
<td>Identification of organisms from the deep soft tissues by</td>
<td>Identification of organisms from fluid or tissue in the organ/space by a</td>
</tr>
</tbody>
</table>
According to the World Health Organization, surgical site infections are one of the most common Healthcare Associated Infection (HAI) in developed and developing countries; in European hospitals SSIs are the second most prevailing HAI. Acquiring a SSI prolongs a patient's hospital stay by 6.5 days, increasing the cost of treatment by tripling the normal amount. These numbers cause SSI to cost in Europe between 1.47 and 19.1 billion. In regard to the most prevalent surgeries at risk of growing a SSI in first place is colon surgery (9.5%), second place is for coronary artery bypass graft (3.5%), third place is occupied by caesarean sections (2.9%), followed by cholecystectomy (1.4%), hip prosthesis (1.0%), laminectomy (0.8%) and knee prosthesis (0.75%). (World Health Organization 2018, 28-29)

Several factors pose a risk for developing a SSI and they can be classified as endogenous and exogenous, the former referring to aspects belonging to the patients and the latter to circumstances surrounding the procedure and care they receive. Notable endogenous factors are age, gender, nutritional status, a high body mass index, tobacco consumption, diabetes and the type of wound. Exogenous factors comprise the intraoperative technique, the duration of the operation (longer operations pose a higher risk), maltreatment of antibiotic prophylaxis, re-operation and a hospital stay of two or more days before the operation, among others. Other risk factors like misuse of antibiotics can be attributed to both categories. (World Health Organization 2018, 33)
2.2 Wound healing process

The wound healing process varies depending on the condition of the wound. If there has not been a notable loss of skin tissue the edges can heal by approximation, this is called primary intention; surgical wounds usually belong in this category. Secondary intention means there was a significant tissue lost and the wound edges cannot join, therefore creating a layer of granulation tissue to cover the wound, which then heals by contracting the edges and forming a scar. Some surgical wounds are closed by tertiary intention, which consists on closing the deep tissue layers but leaving the fat and subcutaneous tissues to develop a layer of granulation tissue for a few days and then bringing the wound edges together. (Potter, Perry, Stockert, Hall 2011, 1061-1062)

There are two processes by which the body promotes wound healing: partial thickness wound repair happens in primary intention wounds since only skin tissue or even dermal tissue has been lost. Full thickness wound repair is involved when the wound extends also to subcutaneous, muscle or bone tissue, and they can be acute, like a surgical wound, or chronic, like a pressure ulcer, thus they can heal by primary or secondary intention. The diagram in figure 1 explains the phases of wound healing for partial and full thickness wound repair. (Potter et al. 2011, 1062-1064)

A few factors allow for the speeding of the healing process and some others hinder a favorable evolution. The age of the patient can affect the effectiveness of the blood flow and distribution of oxygen and nutrients, as well as the inflammatory response and the formation of new tissue. A compromised immune system is more prone to developing infections due to an unreliable progression of the wound healing phases. Diabetes also contributes to these actions, and it is especially worse in patients with uncontrolled levels of glucose. In addition, obesity and smoking are other factors that interfere with tissue perfusion, since there are less capillaries in fatty tissue, and nicotine provokes vasoconstriction and lowers hemoglobin levels. Additionally chemotherapy and radiation therapy damages the body’s ability to start the inflammatory and the immune response, as well as weakening tissues. The characteristics of
the wound are also involved in the success of the healing process; the size of the wound and the stress it endures entails more or less healing time, since stress interrupts tissue repair and an extensive wound, like secondary intention wounds, take longer to heal by being exposed for a longer time. (ibid., 1063) Psychological stress can interrupt the progression of wound healing as well, and lead to problems in other areas like bad nutrition, bad sleep quality or self-neglect. (Olsson, Friman 2020, 14)

**Figure 1. Partial thickness and full thickness wound repair phases.** (Potter et al. 2011, 1062-1064)
2.3 Nursing perspective on SSI prevention

Wound care, like many other healthcare aspects, is an area of multi-professional management. Furthermore, post-operative SSI prevention rates are improved by teamwork. The nurse’s role in this team is to ensure patients safety by providing quality care when handling surgical wounds, this includes SSIs. In order to fulfill this role a nurse must be knowledgeable in the normal wound healing process as well as the different kinds of SSIs, signs and symptoms of the development, risk factors for the presence of infections, at risk patients, wound care interventions, infection control standards and prevention strategies. As well as a counsellor for patients, their families and other professionals. (Mert Boga 2019)

Studies that evaluate the knowledge and performance of nurses in this area reveal serious gaps in the education of SSI prevention, although there is a positive correlation between the years of experience on a nursing job and the degree of expertise. (Mert Boga 2019) There is a lack of understanding of the different types of SSI, infection preventative measures and nursing interventions; identifying these areas serves as a guide to develop new educational resources. (Labeau, Witdouck, Vandijck, Claes, Rello, Vandewoude, Lizy, Vogelaers, Blot 2010)

3. Aim, purpose and research question

The aim of the study is to collect evidence based information on how to prevent surgical site infections. The purpose of the study is to identify areas of the post-operative wound care that promote/develop post-operative nursing care and patient’s recovery.

The research question is the following: What nursing interventions can prevent infections in post-operative wound care?
4. Method

4.1 Literature review

A literature review can be defined as a summary of the findings in various literary sources relevant to a previously identified research question, as well as a critical analysis of the connections between the examined data. (Mongan-Rallis 2018, Aveyard 2010)

The purpose for the creation of a literature review is to gather the available information about the topic proposed and display it in a way that showcases the knowledge at the disposal. A good synthesis of the review highlights the strong and weak points of the research done and can identify contradictions between studies, aiding in the development of said research. Whether it emphasizes the lack of information in some areas, reveals the value of the gathered data or simply classifies previous studies a good literature review is a helpful tool when it comes to making decisions. (Booth, Sutton & Papaioannou 2012)

When writing a literature review the following processes are pursued: identification of the research question; establishment of the aim and purpose of the literature review; conduction of the research, which includes a selection of databases, search terms and inclusion/exclusion criteria to aid in the screening process; extraction of data and evaluation of the quality of said data; interpretation and summarizing of the data and acknowledgement of biases and limitations of the literature review.

4.2 Article selection

The search is conducted gathering literature from databases available for JAMK students: Cinahl Plus-full text (Ebsco), Cochrane Library, Medline and Pubmed. A list of keywords related to the research question is selected to seek results (Table 2). (Rew 2010, 66)
Table 2. Keywords related to the research question.

<table>
<thead>
<tr>
<th>Keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post operative OR post-operative OR postoperative OR post surgery OR post-surgical OR postsurgical</td>
</tr>
<tr>
<td>Wound infection OR post-operative wound infection OR surgical site infection</td>
</tr>
<tr>
<td>Nursing interventions OR nursing care OR nursing support OR nurse's role OR nursing OR nurse</td>
</tr>
</tbody>
</table>

Table 2. Keywords related to the research question.

An inclusion criteria is established to use the searching filters available in the databases more specifically (Table 3), as well for the screening of the articles. (ibid., 66)

Table 3. Inclusion criteria.

- Studies related to post-operative wound management and wound infection prevention and management.
- Studies refer to adult participants only.
- Studies are written in English only.
- Studies are published and peer reviewed.
- Full study access is available for JAMK students.
- Studies are written from 2011 onwards.

After narrowing the search by discarding duplicates and articles that do not fit the criteria, the screening process begins by analysing the titles and abstracts of each article to select the most appropriate according to the inclusion criteria. The remaining articles undergo a process of quality appraisal based on the assessment forms of Hawker et al. (2002), which decides which ones are included in the review. The studies included in the review all had a score above 30 points, ranging from 32 to 35, the maximum being 36 points, and the minimum 14 points. In the appendix is found the table that illustrates the quality appraisal of the articles (Appendix 1).

To simplify the findings of the search a PRISMA chart has been developed in figure 2 explaining the process. (Page, McKenzie, Bossuyt, Boutron, Hoffmann, Mulrow, et al. 2020)
4.3 Data analysis

The extraction and analysis of data is realized through inductive content analysis. This method allows for information that answers to the research question to be collected throughout the articles that constitute the review, which is then divided into categories based on the commonalities between the materials gathered. (Elo, Kyngäs 2007) A summary of the findings can be located in the appendix (Appendix 2).
The nursing interventions were determined by reading through the selected articles and identifying procedures aimed to the care of surgical wounds, by highlighting sections of text that indicated so. These were later compiled into a list from which they were grouped into three main categories that answered the research question.

Negative pressure wound therapy consists of a closed, sealed system that applies negative pressure (suction) to the wound surface.

Furthermore, dressings may have additional roles in managing wound exudate, protecting wounds and their staples or sutures, and meeting patients' expectations by 'hiding' the wound, or, alternatively, when transparent dressings are used, facilitating health professionals' observation of the wound.

Figure 3. Data analysis process.

The categories were determined by analysing the common themes between the interventions, mainly centred in the application of the intervention to the wound care. Below are the three categories derived (Figure 4).

Interventions for the prevention of SSIs in post-operative care

Wound care: Interventions in direct contact with the wound.

Medication: Pharmacological interventions.

General care: Interventions not in direct contact with the wound.

Figure 4. Intervention categories.
5. Results

In the table below are reflected the results of the data analysis, organized into three subcategories.

<table>
<thead>
<tr>
<th>INTERVENTIONS</th>
<th>MEDICATION</th>
<th>GENERAL CARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WOUND CARE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wound dressing techniques</td>
<td>Antibiotic prophylaxis</td>
<td>Hand hygiene</td>
</tr>
<tr>
<td>Wound irrigation</td>
<td>Antiseptic treatments</td>
<td>Post-operative blood glucose monitoring</td>
</tr>
<tr>
<td>Negative pressure wound therapy</td>
<td>Antibiotic treatments</td>
<td>Pain assessment</td>
</tr>
<tr>
<td>Wound cleansing</td>
<td>Non-anti-microbial treatments</td>
<td>Teaching</td>
</tr>
<tr>
<td>Post-operative showering</td>
<td>Non-microbial treatments</td>
<td></td>
</tr>
<tr>
<td>Reducing wound stress and tension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wound surveillance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rehydration and debridement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removal of the initial post-operative dressing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provision of a moist wound environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pin site care for external bone fixators</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4. Nursing interventions

5.1 Wound care

The first category gathers all interventions that are in direct contact with the surgical wound. Here are included wound dressings, wound cleaning techniques, wound healing techniques and other wound caring procedures.

There are many types of wound dressings and the choice is determined by the type of wound. The rationale behind the use of wound dressing is to implement a protective barrier against environmental contaminants and favor the healing process. Overall a good dressing should provide good absorption and avoid leakage of the wound exudate, impermeability to water and bacteria, maintain a stable temperature, be easily removed without trauma to the tissue or leaving residues, suitable for different kinds of surgical closures,
confortable, affects the formation of the scar tissue and pain relief, influences
the frequency of dressing changes and facilitates inspection of the wound.
Alternatives to wound dressings include using glue as a dressing or leaving
the wound exposed. (Dumville, Gray, Walter, Sharp, Page, Macefield,
Blencowe, Milne, Reeves, Blazeby 2016, 21, 22)

Wound dressings can be divided into basic dressings and more complex
dressings. Basic dressings are made out of gauze or cotton, are in direct
contact with the wound and are used to absorb the exudate. Some can
contain povidone iodine or chlorhexidine. Complex dressings can have
various components and be more specialized. These are used as a
waterproof, anti-bacterial and anti-microbial barrier, as well as absorbants.
Glue as a dressing is used in small wounds as a protective barrier and support
for the sutures. It is considered enough of a covering and does not need
additional dressings. (Dumville et al. 2016, 22)

Regarding the effectiveness of the dressing types for the prevention of SSI,
studies find that the evidence available is not enough to determine the
efficiency of any type of dressing compared to leaving the wound exposed or
to other dressing types, and that more research is needed in order to gather
compelling evidence based information. (Dumville et al. 2016, 29-35)

Wound irrigation, although it can occur during surgery, is a wound cleaning
technique that can be used post-operatively. Depending on the need there can
be variations in the type of fluid used, the amount of fluid and the method of
irrigation. (Norman, Atkinson, Smith, Rowlands, Rithalia, Crosbie, Dumville
2017, 9)

Respecting irrigation techniques the fluid can be poured over the wound or
delivered in pulses. When comparing both methods studies report that
pulsatile irrigation is more effective against developing SSIs. (Norman et al.
2017, 31, 37) Irrigation fluid can be divided into three categories: antibiotic,
antiseptic and non-antibacterial irrigants, commonly used saline. Comparing
antibiotic with non-antibacterial solutions there appears to be a lower instance of SSIs in patients treated with antibiotic irrigation, although there are no clear differences between different kinds of antibiotic solutions. Between antiseptics, when comparing povidone iodine to other kinds studies show that superoxidised water is more effective, but it is not clear whether clorhexidine is more efficient or not. Overall, on average, there is no clear distinction between patients treated with irrigation and patients who did not get the treatment. (Norman et al. 2017, 26, 27, 28, 29, 30, 37)

Negative pressure therapy is a technique used for primary intention wounds and skin graphs, except for orthopaedic patients until evidence of its safety is gathered. (Gillespie, Walker, McInnes, Moore, Eskes, O'Connor, Harbeck, White, Scott, Vermeulen, Chaboyer 2020, 8) An open cell foam or a gauze dressing is applied on top of the wound and covered with occlusive drape, sealing the edges of the dressing. A suction tube is then connected from the wound dressing to a vacumm pump and a liquid waste collector, creating the negative pressure. This suction can be intermitent or applied constantly. Negative pressure therapy is supposed to help increase blood flow, the production of granulose tissue, the number of fibrocytes and endothelial growth factor; and reduce bacterial infection, oedema and exudate. But these benefits are unclear and in some cases studies contradict each other, thus it is uncertain the efficacy of negative wound pressure. (Webster, Liu, Norman, Dumville, Chiverton, Scuffham, Stankiewicz, Chaboyer 2019, 6) When comparing negative wound therapy to regular dressing evidence suggests that it may be slightly more effective in the prevention of SSIs. (Webster et al. 2019, 19, 20) In regards of prophylactic use of this kind of therapy, the evidence of its efficacy is very low. (Gillespie et al. 2020, 13)

Other interventions mentioned consist of the use of antibiotics as prophylactics, use of wound cleansing agents like saline, removal of the surgical dressing 48 hours after the operation, the care of additional elements like drainage tubes or external bone fixator pins, post-operative showering, reducing tension on the wound, maintenance of a moist wound environment, debridement, surveillance of the wound during the healing proccess, personal
hand hygiene and use of current information and guidelines. (Gillespie, Walker, McInnes, Moore, Eskes, O'Connor, Harbeck, White, Scott, Vermeule, Chaboyer 2020, 8; Moran, Byrne 2018, 36, 37, 40)

5.2 Medication

In this group are the interventions related to medication administration. When treating SSIs antibiotics or antiseptics can be applied to stop the spread of the infection and diminish the bacterial load, thus helping the wound to heal faster. Antibiotics work against bacteria by suppressing DNA, protein synthesis or disturbing the cell wall. Antiseptics can be used to eradicate bacteria or merely reduce their growth rate. Antiseptics can work against other micro-organisms as well while avoiding damage to tissues. (Norman, Dumville, Mohapatra, Owens, Crosbie 2016, 4, 5)

Antibiotics can be administered systemically for treating the whole body or be applied locally in the form of topical treatments, along with antiseptics. There are two ways of applying topical medication: products used for wound irrigation or cleaning, or treatments that stay in contact with the wound, like ointments for example. Anti-microbial dressings are also available, to be used depending on the wound exudate levels. (Norman et al. 2016, 5)

Regarding the effectiveness of these treatments, studies show that antiseptic and anti-microbial treatments slightly improve the condition of the wound, for instance helping with pain relief or foul smell. However, the data retrieved in these studies is very limited, resulting in low quality evidence. Further research is needed to achieve evidence based conclusions. (Norman et al. 2016, 16)

5.3 General Care

In this category are grouped the interventions that prevent SSI development but are not involved in immediate wound care. Proper hand hygiene techniques for example are an essential intervention for all nursing areas, and
especially significant for the prevention of SSIs. (Sickder, Lertwathanawilat, Sethabouppha, Viseskul 2017)

Monitoring blood glucose after surgery to ensure the proper blood glucose levels, with especial attention to diabetic patients, is also important. Guidelines establish that patients in the ICU should have glucose levels of 10.0mmol/L, and 7.8mmol/L and below after the ICU stay or after the third post-operative day. Nurses have the task to maintain glucose levels within these guidelines while also avoiding hypoglycemia. However there is not enough evidence based information to confirm the effects of post-operative blood glucose regarding infection development. (Logan, Quinn, Brault, Vandal, Paré, Clarke 2016, 24)

Pain assessment is another tool used for the prevention of SSIs. By checking the patient’s pain levels delayed wound healing can be avoided, through the decrease of stress and anxiety levels, and deactivation of the sympathetic nervous system. Preventing the release of cortisol and catecholamines avoids lessening the action of the immune response and vasoconstriction, thus helping the delivery of oxygen and nutrients to the wound and hindering infections. (Logan et al. 2016, 25)

Finally, teaching the patient about their own wound care and encouraging self-care activities improves stress, depression, physiological outcomes and reduces the time spent in hospital. Nevertheless, more evidence is needed to clarify the influence of education in SSI prevention, as well as standard guidelines. (Logan et al. 2016, 24, 25)
6. Ethics and Discussion

6.1 Ethical considerations

The ethical framework developed by Gallin et al. (2007) lists seven principles to follow for an ethical research: value, validity, fair subject selection, favourable risk-benefit ratio, independent review, informed consent and respect for enrolled participants. Regarding the value of the thesis, the answer to the research question provides insight into the circumstances around nursing care of surgical wounds and highlights areas that need development; however, the studies selected come from only five countries, constituting a small sample and ineffective to generalize. The validity is demonstrated by the clear description of the methodology followed during the creation of the thesis, assuring the reliability of the results. This thesis being a literature review does not have direct contact with participants of the studies, thus the principles of fair subject selection, favourable risk-benefit ratio, informed consent and respect for enrolled participants do not apply. The ethical issues of the articles selected have been considered during the quality appraisal process, following the guidelines of Hawker et al. (2002) The data extracted from these articles has not been manipulated or misconstrued to abstain from fabrication and falsification, and has been paraphrased or quoted following JAMK’s (Jyväskylän Ammatikorkeakoulu) reporting instructions to avoid plagiarism.

In this literature review, eight studies have been examined; four of them being systematic reviews, one systematic meta-review, one literature review and two studies that applied quantitative and qualitative research methods. From the above mentioned articles, twenty nursing interventions aimed to SSI prevention were identified. Of those twenty interventions only one was found to be backed by evidence based information (5%); eleven interventions were supported by low quality evidence or not enough evidence (55%); and the last eight were only mentioned in passing (40%). Albeit the scale of the review is small, and not nearly enough to be representative, it is remarkable that such a high percentage of the interventions were insufficiently proven to be efficient against SSIs.
6.2 Discussion of results

After the examination of these eight articles and studies the conclusion reached has been the same as many others’ before. There is a scarcity of evidence when it comes to the efficacy of the majority of the interventions mentioned, which in turn causes a lack of evidence based information nurses can access. This scarcity of information available is made clear in studies where nurses’ knowledge and performance regarding wound care is evaluated. The poor quality data available, sometimes even contradictory, only serves to difficult the discernment between useful and harmful information, leaving healthcare professionals disconcerted. When in doubt, healthcare providers tend to rely on their “intuition, personal experience, peer opinions, professional norms and past teaching” (Gillespie et al. 2020, 13), these habits are prone to biases and can prove inefficient or even harmful. Without evidence based information is not possible to evaluate the quality of care provided, hence the use of possibly misguided practices continues and with it the provision of poor quality care. (ibid., 13)

In regards to nursing education there needs to be a concentrated effort in the inclusion of wound care in the curriculum, built around evidence based, effective information; along with providing ongoing education throughout nurses’ working life. (Moran, Byrne 2018, 40) Other studies suggest the implementation of evaluation systems to oversee nursing performance and the effectiveness of the interventions against SSIs, building a tool to detect aspects of the care that need improvement. (Sickder, Lertwathanawilat, Sethabouppha, Viseskul 2017, 253) A continuous revision of the knowledge is necessary to stay updated with the current medical advances.

As previously mentioned, the scale of the study is very limited, but the results can be applicable to any healthcare department that effectuates wound care of any kind, independently of whether surgical wounds are treated or not.
7. Conclusion

More studies and investigations need to be performed to gather sufficient evidence based information to dissipate ambiguities regarding wound care. A general guideline for interventions aimed to the treatment of wounds in postoperative care should be established and nurses should invest time in learning about the wound healing process and wound care, given the fact that is a skill applied to plenty of nursing areas.
8. References


## Appendix 1

<table>
<thead>
<tr>
<th>Author</th>
<th>Abstract and Title</th>
<th>Introduction and Aims</th>
<th>Methods and Data</th>
<th>Sampling</th>
<th>Data Analysis</th>
<th>Ethics and Bias</th>
<th>Results</th>
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<th>Implications and Usefulness</th>
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## Appendix 2

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<th>Research method</th>
<th>Main conclusion</th>
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<td>Intracavity lavage and wound irrigation for prevention of surgical site infection.</td>
<td>Norman, Atkinson, Smith, Rowlands, Rithalia, Crosbie, Dumville.</td>
<td>2017</td>
<td>UK</td>
<td>Systematic review.</td>
<td>Pulsatile irrigation may be more effective than normal irrigation in SSI prevention but more evidence is needed.</td>
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<td>Preoperative and postoperative recommendations to surgical wound care interventions.</td>
<td>Gillespie, Walker, McInnes, Moore, Eskes, O’Connor, Harbeck, White, Scott, Vermeulen, Chaboyer.</td>
<td>2019</td>
<td>Australia</td>
<td>Systematic meta-review</td>
<td>There is not enough evidence based information to back surgical wound care practices, more research is needed.</td>
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<td>Antibiotics and antiseptics for surgical wounds healing by secondary intention.</td>
<td>Norman, Dumville, Mohapatra, Owens, Crosbie.</td>
<td>2016</td>
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<td>Negative pressure wound therapy for surgical wounds healing by primary closure.</td>
<td>Webster, Liu, Norman, Dumville, Chiverton, Scuffham, Stankiewicz, Chaboyer.</td>
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<td>Low-certainty evidence suggests that negative pressure wound therapy may be more effective than regular dressings.</td>
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<td>Assessing knowledge of wound care among cardiothoracic nurses.</td>
<td>Moran, Byrne.</td>
<td>2018</td>
<td>Ireland</td>
<td>Descriptive quantitative method.</td>
<td>There are gaps in the knowledge of wound care of cardiothoracic nurses in the Republic of Ireland.</td>
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