

Modern Wound Care Application: A Literature Review

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Abstract

Wounds are damage to tissue structures and normal anatomical functions as a result of pathological processes originating from internal and external that hit certain organs. Wounds can be classified based on anatomical structure, properties, the healing process, and length of healing. The literature review aims to find out the modern application of the wound care-related wound healing process. Literature review through several stages, namely making questions, identification, eligibility, selection of article inclusion, and screening. The Selection Process is listed in the framework of the review literature and obtained the results of article 7 articles. The data showed different results adjusted to the system and the conditions of where the research was conducted. The results of the reviewed article focus on explaining the patient's comfort level and more significant healing process. Modern wound care application has been proven to provide comfort to patients in carrying out the wound healing process, and is very helpful for nurses in providing nursing services. The application of modern wound care is a wound care technique that will develop at any time based on the development of nursing science, in which case it focuses on the level of comfort of patients in receiving health services related to wound care. So nurses urgently need to improve and develop science related to the application of modern wound care that will support patient comfort in wound care and accelerate the wound healing process well.

Keywords: Application, Modern, Wound, Care.

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A. INTRODUCTION

Wounds are damage to tissue structures and normal anatomical functions as a result of pathological processes originating from internal and external that hit certain organs. Wounds can be classified based on anatomical structure, properties, the healing process, and length of healing (Meilin et al., 2019). Based on the cause of the wound is divided into 2, namely accidental wounds and accidental wounds. Accidental wounds are divided into 2, namely closed wounds and open wounds (full-thickness open wound). Full-thickness open wound requires good care to be able to get optimal wound healing process. Open wounds are a common problem for people and are often considered minor, whereas open wounds can cause contamination of the wound. Contaminated wounds are potentially infected with spillage of the respiratory tract, gastrointestinal tract, and urinary tract (Oktaviani et al., 2019). Wounds that show signs of infection in the wound occur due to a lack of hygiene starting from the beginning of the wound until the time of treatment (Gito & Rochmawati, 2018)

Wound care management in this case is indispensable to improve healing, prevention of further skin damage, reduce the risk of infection and improve patient comfort. The different types of wounds associated with the wound healing stage

require proper wound management (Purnamawati & Asri, 2013). The wound healing process has a complex and dynamic response to get good results, so in providing wound care in need of the right response to produce continuous anatomical recovery (Handayani, 2016). Modern wound dressing application is one of the closed wound treatment methods and focuses on maintaining moisture in improving the wound healing process (Dhivya et al., 2015)

Asia Pacific Wound Care Congress (APWCC) in 2012 noted that the management of modern wound care applications in Indonesia began to run well, there were only 25 out of 1000 more hospitals, especially in Java (Fatmadona & Oktarina, 2016). Data from hospitals in Western Indonesia shows that there were 168 patients in 4 months in early 2019 who received special wound care using modern wound care techniques (Meilin et al., 2019). Modern wound care is believed to be more effective than conventional wound care where conventional wound care is a wound treatment that still uses materials that make the wound easily dry (Adriani, 2016). The main purpose of wound management is for debridement and protection against infection.

Wounds that have been infected with poly-microbial bacteria and contaminated by pathogens are the main cause of wound infection that occurs among other microorganisms located on the skin. The initial stage of chronic wound formation is characterized by the appearance of Gram-positive organisms such as *Staphylococcus Aureus* and *Escherichia coli*. At a later stage, Gram-negative *pseudomonas* species are common and tend to attack the deeper layers of the wound (Sarheed et al., 2020). Prevention of such infections can be done with the treatment of wounds. The wound care method that is developing today is to use the application of modern wound care, a holistic wound care method that focuses on caring or caring for the wound healing process by maintaining the cleanliness and moisture of the patient's wound so that the patient is more comfortable and calm in receiving continuous wound care. Nurses have a very important role in wound management in patients, especially in hospitals where patients are almost 24 hours in monitoring and responsibility of nurses. Nurses are required to have adequate knowledge and skills related to the holistic wound care process starting from a comprehensive assessment, proper intervention planning, implementation of actions, evaluation of results found during treatment as well as documentation of systematic results (Chrisanto, 2017). Another issue that nurses should understand is related to cost-effectiveness. The management of modern wound care applications is very concerning, as this is supported by the increasing number of recent innovations in the development of products that can be used in wound care. Nurses should be required to understand these products well as part of a decision-making process that suits the needs of patients. The selection of the right product should be based on cost, comfort, and safety considerations. In general, wound care that develops at this time is emphasized more on interventions that look at the client-side of various dimensions, namely the physical, psychic, economic, and social dimensions. The

purpose of this literature review is to find out "does the nurse know the modern application of wound care in providing wound care?".

B. METHOD

The main focus of this review paper is on the application of modern wound care on wound care. The preparation of this review through several stages is to create a research question by the PICOS method (Problem, Intervention, Comparison, Outcome and Systematic), and then conduct a literature review using diagrams, consisting of identification, eligibility, screening, feasibility selection, and determination of articles that fit the inclusion criteria. At the last stage, the review is done systematically using tables.

Journal identification is done by searching journal articles in three databases. The databases used by the authors are Google Scholar, PubMed, and Science Direct. Furthermore, before performing a search, the author chooses the settings on each database search page namely: articles published between 2011-2020, reference types are articles, the language used is English. Keywords used by the authors in this literature review there are 4 keywords in each database, namely Application, Modern, Wound, Care. From these keywords are expected to be conducted a literature review to answer the question of researchers. Then after searching on each keyword, the author combines/compiles the keyword with the conjunction and (And). At the Identification stage, the number of articles obtained on the Google Scholar database is 15 articles, on the PubMed database are 38 articles, and on Science Direct 82 articles.

Eligibility is an eligible article. At this stage the eligible articles are adjusted based on the suitability of the title and abstract article, At the eligibility stage the remaining articles on the Google Scholar database are 5 articles, PubMed database is 10 articles, and Science Direct 9 articles.

Selection of articles that are by the criteria of inclusion must be done the selection process based on the existing inclusion and exclusion criteria. The criteria for inclusion and exclusion have been determined by the author. The inclusion criteria include: there are explanations about modern wound care application management, modern wound care, nurse knowledge, and articles using only English. Selection of articles that are by the criteria of inclusion must be done the selection process based on the existing inclusion and exclusion criteria. The criteria for inclusion and exclusion have been determined by the author. The inclusion criteria include: there are explanations about modern wound care application management, modern wound care, nurse knowledge, and articles using only English. In the exclusion criteria are articles in the form of systematic review, literature reviews or meta-analysis, and related articles, can't be read and can't be edited. At this stage, the article needs to be read in whole or full text. Results at the customization stage based on inclusion and exclusion criteria are 2 articles on the Google Scholar database, 2 articles on the PubMed database, and 3 articles on the Science Direct database.

Screening is a stage to see if there are similar articles between the two existing databases. Of the total number of articles that have been selected through the previous stage is 7 articles, and no articles are the same (no duplicates), so at the screening stage, the number of articles remaining is 7 articles. Assessment results attached in Table 1.

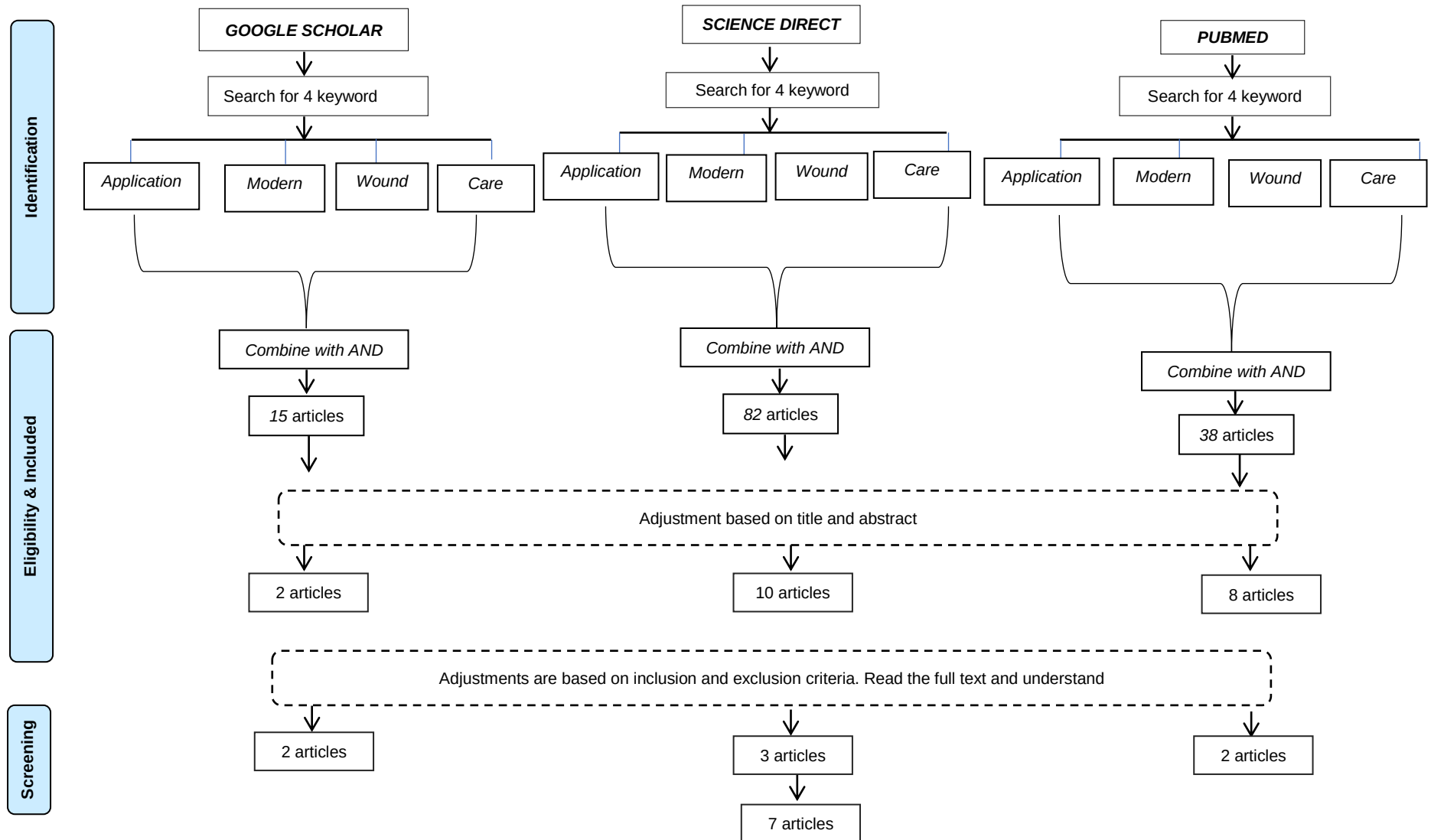


Figure 1. Article Search Process

Table 1 Research Journal Search Results

No.	Author	Journal	Title	Methods (Design, Sample, Variable, Instrument, Analysis)	Research Results
1.	(Mahyudin et al., 2020)	Ners Journal	Modern and Classic Wound Dressing Comparison in Wound Healing, Comfort and Cost	D: prospective studies S: orthopedic and traumatology patients treated at dr. Soetomo Hospital Surabaya's surgical room V: modern dressings and classic dressings I: BWAT score (Bates-Jensen Wound Assessment Tool) A: independent T-test & Mann-Whitney test	Modern use of dressings has the same cost-effectiveness as classic dressings and has more satisfactory results in wound care in terms of comfort and healing.
2.	(Reber & Nussbaumer, 2018)	Biochemical Pharmacology	Effective debridement with micro water jet technology (MWT): A retrospective clinical application observation of 90 patients with acute and chronic wounds	D: experimental studies in retrospective analysis S: all patient data treated with micro water jet technology (MWT) and against different types of injuries, over 3 years V: Effective debridement with micro water jet technology (MWT) I : observation sheet A: retrospective data	Debriding using micro water jet technology is an efficient method, repairing tissues, precisely, and saving time for the treatment of outpatient wounds with excellent healing results, and no side effects
3.	(Yilmaz & Isik, 2020)	Burns	Traditional and modern practices in wounds and burn injuries in a population of North-	D: cross-sectional descriptive studies S: hospital patients who have been injured V: traditional and modern	Modern burns treatments are proven to be better at providing proper, fast, and comfortable wound care and healing. Maximum healing results and more efficient in maintaining the

			Western Turkey	practices on burns I: questionnaire sheet A: Chi-square test	level of cleanliness of the patient's wounds
4.	(Sari & Sutrisna, 2019)	Wound Medicine	The effect of the short duration of electrical stimulation on wound healing in the acute wound in a rat model	D: experimental studies S: male Wistar rat (180–200 g; 12–14 weeks) V: short duration of electrical stimulation on acute wound healing in rats I : observation sheet A: Man-Whitney test	The application of electrical stimulation given for 10 minutes can significantly improve wound healing when compared to the use of modern bandages only, and electric sympathy can reduce inflammation, improve reepitelization and angiogenesis.
5.	(Schmitz et al., 2020)	Wound Medicine	Pilot-study switchable film dressing & elderly skin/patients with chronic wounds: A non-interventional, non-placebo-controlled, national pilot study	D: experimental studies S: patients with elderly skin/patients with chronic wounds who get regular wound care from various etiologies V: film dressings for modern wound healing I: observation sheet A: test t (one-sample t-test)	The use of film dressings can reduce adhesion when illumination allows the easy and comfortable release of the dressing so that the patient does not feel severe pain and can significantly improve wound healing.
6.	(Mei et al., 2017)	Regenerative Medicine Research	The application of the modified surgical wound dressing in wound care after tracheotomy	D: experimental studies S: patients with tracheostomy mounting wounds V: patients with tracheostomy mounting wounds I: observation sheet A: chi-square test	Infection rates, wound closure times, frequency of dressing replacements, and wound care costs are much higher in traditional treatment groups than in the surgical wound dressing group and the (modern) surgical wound dressing group. Research data shows that patients in the modified (modern) sanitary pad group feel more comfortable.

7.	(Tasić-Kostov et al., 2019)	Journal of Ethnopharmacology	Towards a modern approach to traditional use: in vitro and in vivo evaluation of Alchemilla Vulgaris L. gel wound healing potential	D: experimental studies S: patients with skin injuries V: application of modern application approach to the use of traditional techniques: evaluation in vitro and in vivo in the potential of wound healing gel Alchemilla Vulgaris L. I: observation sheet A: in vitro scratch test with fibroblast L929, and in vivo study of potential skin barrier repair of hydrogels with A. Vulgaris extract	Folkloric use of A. Vulgaris in the treatment of wounds, especially after inclusion in hydrogels, and underlines the importance of appropriate means for incorporating herbal extracts intended for topical treatment.
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C. RESULTS AND DISCUSSION

Research related to the application of modern wound care in providing health services to patients to the level of wound healing significantly, safely, and comfortably is a step that must be achieved by health care workers, especially nurses, from seven articles reviewed about modern wound care, from 5 articles reviewed about modern wound care, all research conducted by this review paper using experimental study design, while 1 article uses prospective studies and the other cross-sectional descriptive study. All articles reviewed are entirely related to modern applications in wound care.

The results of Mahyudin et al., (2020), with the research title "Modern and Classic Wound Dressing Comparison in Wound Healing, Comfort and Cost" showed the results of the modern use of dressings have the same cost-effectiveness as classic dressings and have more satisfactory results in wound care in terms of comfort and healing. The study impacted the more efficient rate of wound healing by emphasizing patient comfort and improving wound healing, as well as providing an overview of the costs incurred in traditional and modern wound care, with results showing that modern wound care has the same costs as traditional wound care costs, but for a more significant level of comfort and healing of modern wound care.

The results of Reber & Nussbaumer (2018), titled "Effective debridement with micro water jet technology (MWT): A retrospective clinical application observation of 90 patients with acute and chronic wounds", showed that debriding using micro water jet technology (MWT) is an efficient, fast method of repairing tissues, precisely, and saving time for the treatment of outpatient wounds with excellent healing results, and no side effects. The research has shown modern applications in wound care with the latest innovations and provide significant results, as well as prioritizing patient comfort in providing holistic wound care efforts, it can be utilized by health care workers, especially nurses in providing nursing services to patients to provide efficient services.

The results of Yilmaz & Isik (2020), with the research title "Traditional and modern practices in wounds and burn injuries in a population of North-Western Turkey", showed that modern burns treatment is proven to be better in providing proper, fast, and comfortable wound care and healing. Maximum healing results and more efficient in maintaining the level of cleanliness of the patient's wounds. The research proves that in providing good wound care burns, open wound first aid is precisely the main factor in improving the structure of the wound state. First aid in patients with burns and open wounds is to maintain the cleanliness of the wound and provide sterile dressing to prevent infection, it is proven the first step in accelerating wound healing.

The research results Sari & Sutrisna (2019), with the title of the study, "The effect of the short duration of electrical stimulation on wound healing in the acute wound in a rat model", showed the results that the application of electrical simulation given for 10 minutes can significantly improve wound healing when

compared to the use of modern bandages only, and electric simulation can reduce inflammation, improve reepithelization and angiogenesis. The results of the study prove that the latest developments, progress, and innovations related to the application of wound care in a modern way, which prioritizes the significance of wound healing patients comfortably, and quickly. The results of the study have been proven that wound healing techniques are growing and advanced in providing health services to patients, using electrical simulation technology will make it easier to significantly accelerate wound healing in patients.

The results of the study Schmitz et al. (2020), with the study title "Pilot-study switchable film dressing & elderly skin/patients with chronic wounds: A non-interventional, non-placebo-controlled, national pilot study", showed the results that the use of film dressings can reduce adhesion during illumination that allows the release of bandages easily and comfortably so that patients do not feel severe pain and can improve wound healing significantly. The research proves that carrying out wound treatment using film wrap, is very good in providing comfort, reducing pain, and speeding up the wound healing process.

The results of the may et al. (2017) study, titled "The application of the modified surgical wound dressing in wound care after tracheotomy", showed that infection rates, wound closing times, frequency of dressing replacements, and wound care costs were much higher in the traditional treatment group than in the surgical wound dressing group and the (modern) surgical wound dressing group. Research data shows that patients in the modified (modern) sanitary pad group feel more comfortable. Modified (modern) wound care techniques are proven to be more efficient in the healing process and have a relatively lower cost expenditure compared to traditional treatment techniques, so it is very helpful for nurses and patients in the wound healing process so that the workload of nurses can be more efficient and more cost-effective patient expenses.

The results of Tasić-Kostov et al. (2019), titled "Towards a modern approach to traditional use: in vitro and in vivo evaluation of *Alchemilla Vulgaris* L. gel wound healing potential", show that folkloric use of *A. Vulgaris* in wound treatment, especially after inclusion in hydrogels, and it is necessary to remember that the importance of appropriate means to include herbal extracts intended for topical treatment. The wound healing process in the study is an herbal treatment technique that can accelerate the wound healing process more efficiently. The combination of folkloric *A. Vulgaris* and hydrogel in the wound healing process has proven to be very effective and efficient, in this case, modern wound care application has developed well, and can improve knowledge related to wound care science in modern.

The results of the literature review of some of the above articles can be explained that some modern wound care application methods have been shown to provide comfort to patients in carrying out the wound healing process and greatly assist nurses in providing nursing services.

The results of the review of the article that prioritizes the comfort of patients in the wound care process, it is directly proportional to Kolcaba's nursing theory that focuses its discussion on the level of patient comfort. Kolcaba (1994) in Agustina (2018) defines comfort as a state of having fulfilling basic human needs. These needs have four types that relate to the experience received by patients with wounds, namely physical, psychospiritual, sociocultural, and environmental needs.

Kolcaba (1994) in Agustina (2018) defines comfort as a state that has fulfilled basic human needs. These needs have four types that relate to the experience received by the patient, namely physical, psychospiritual, sociocultural, and environmental needs. Efforts to accelerate the improvement of the wound healing process can be achieved through various ways, including through the fulfillment of basic human needs, namely physical, psychospiritual, sociocultural, and environmental. Wound care during this time tends to prioritize the fulfillment of physical needs including increased intake of nutrients and a warm environment. The application of modern wound care is effective in accelerating the improvement of the wound healing process because in addition to trying to meet physiological needs also improve patient comfort through improved environmental conditions, the use of dressings is an effort to provide comfort to patients in the healing process.

D. CONCLUSION

Modern wound care application has been proven to provide comfort to patients in carrying out the wound healing process and is very helpful for nurses in providing nursing services. The application of modern wound care is a wound care technique that will develop at any time based on the development of nursing science, in which case it focuses on the level of comfort of patients in receiving health services related to wound care. So nurses urgently need to improve and develop science related to the application of modern wound care that will support patient comfort in wound care and accelerate the wound healing process well.

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