

## Original Research Article

**WOUND CARE WITH MOIST WOUND DRESSINGS FOR HEALING  
DIABETIC GANGRENE: SYSTEMATIC REVIEW**Ary Dwi Wuryani<sup>1)\*</sup><sup>1)</sup> IIK Strada Indonesia, Jl. Manila No.37, Tosaren, Pesantren, Kediri City, East Java,  
Indonesia 64133\*Corresponding Author, E-mail : [sutrisnoarik@gmail.com](mailto:sutrisnoarik@gmail.com)**ABSTRACT**

**Introduction.** Wound care with moist wound dressings is an effective and beneficial option for treating diabetic ulcers which often result in healing of old wounds that end in amputation. Writing this literature review aims to identify the effectiveness of the use of wound care with diabetic gangrene moist wound dressing. **Method.** The literature review writing method goes through several stages: creating questions and keywords namely MESH (*Medical Subject Heading*), identification, eligibility, selection of article inclusions, screening, and assessment. The selection process listed in the literature framework resulted in 4 articles. Articles are summarized and assessed using critical appraisal according to the research design in each article. **Result&Analysis.** The wound care method with moist wound dressings has been proven to significantly help the healing process of diabetic gangrene wounds. The wound care method with the principle of moisture balance, is more effective than conventional methods. **Discussion.** Modern dressing wound care has been proven to help heal diabetic wounds effectively, this is evidenced by the mechanism of the average decrease in the occurrence of the wound dressing process and an increase in the quality of life of diabetic ulcer wound patients after being treated with modern wound dressing methods.

Keywords: Diabetic Gangrene, Moist Wound Dressings, Wound Care.

**INTRODUCTION**

Diabetes mellitus (DM) is a health problem that needs to be treated thoroughly, uncontrolled DM can cause metabolic complications or long-term vascular complications, namely microangiopathy and macroangiopathy. Diabetics are also prone to wound infections in the feet, ineffective wound treatment increases the incidence of complications from diabetic gangrene (Buchori, Sukron and Wahyudi, 2020).

The data and information center of the Ministry of Health of the Republic of Indonesia (Kemenkes) explained that in 2021 the most common complication in Diabetes Mellitus cases is neuropathy, which is 54%, where neuropathy decreases sensation in the distal area of the foot so that there is a high risk of foot gangrene and can even lead to infection to amputation (Suprihatin and Purwanti, 2021). Wounds that arise spontaneously or due to trauma can cause open wounds

capable of producing gangrenous gas resulting in osteomyelitis (Fitria et al., 2017). Patients with gangrene can be treated by improving peripheral perfusion. Good perfusion helps in transporting oxygen and blood to damaged tissues thus helping to grow new tissues (Hidayat, 2017).

Previous wound care management using conventional methods is with methods that do not make the wound area moist by using gauze attached to the wound. This is what usually makes gauze will stick to the wound and make the newly grown cells will be damaged during the next wound treatment, causing discomfort at the change of client dressing. For this reason, it is necessary to choose the right wound care method to speed up the wound dressings process. Currently, wound care has undergone many developments, one of which is the method of wound care with modern dressings, namely by maintaining a moist wound environment to maintain tissue fluid loss and cell death (Handayani, 2016). Proper wound care is an effort to help speed up the wound dressings process so it needs to continue to be developed (Ose, Utami and Damayanti, 2018). Diabetic wounds that do not heal are a risk factor for infection and a leading cause of amputation and death. But diabetes experts estimate that 1/2 to 3/4

amputation events can be avoided with proper foot care (Santoso, Rahayu and Irawan, 2022).

Efforts are made to heal gangrenous wounds which include: mechanical control consists of resting the foot, avoiding pressure loads on the wound area, activity on the foot facilitating the spread of infection, using pillows on the feet while lying down to prevent abrasions on the heels, decubitus mattresses. The vascular control mechanism that is currently being developed as an effort to heal diabetic gangrene wounds is Moist wound dressings. Modern wound care uses modern dressings with moist and closed wound care techniques or known as moist wound dressings. Moist wound dressings is a method to maintain wound moisture by using moisture-retaining dressing materials so that wound dressings, tissue growth can occur naturally. Fast and precise wound dressings without causing pain during treatment can improve the quality of life of patients with diabetic gangrene while metabolic control is the control of other factors, such as: hypertension, hypercholesterolemia, electrolyte disorders, anemia, impaired kidney function, comorbidity infections in the lungs; wound control consists of debridement and necrotomy, dressing, drugs to accelerate healing, if necessary

by operative measures; Infection control such as: administration of adequate antibiotics adapted to culture examination, empirical therapy according to multiorganism, anaerobic, aerobic, overcoming systemic infections elsewhere; educational control, including the patient and family, explanation of the disease, diagnostic and therapeutic action plans, risks to be experienced and prognosis; Vascular control, for example, is modifying risk factors in the form of smoking cessation, medical therapy in the form of medication and complementary therapy (Naziyah, Suharyanto and Fauziyah, 2022)

## **METHOD AND ANALYSIS**

The research design is a systematic review. Article searches used the PubMed online database and Google scholar and Scopus. The articles used in this systematic review were articles published from 2011 to 2020. The search process was carried out by the authors in the period January-February 2023. In the process of searching for articles, researchers used the keywords "moist wound dressing", "diabetic gangrene", and "diabetic gangrene". injury cure". The inclusion criteria for this study were: 1) articles explaining wound care with moist wound dressing in diabetic gangrenous wound dressing 2) original research

results; 3) The research subjects were diabetic gangrene patients; 4) open access and full paper discussing wound dressing. The exclusion criteria for this study were: 1) articles in languages other than English and Indonesian; 2) systematic reviews; 3) Research data is incomplete or not available. Search articles using online databases (PubMed, Google Scholar and Scopus). The process of searching and filtering articles uses the Prism chart (chart 1). Articles included in this study must meet the inclusion criteria and have been reviewed using critical appraisal in accordance with the research design of each article (CASP Checklists, 2023).

## **RESULT**

Characteristics of the Research Subject, there are a total of 828 articles searched from online databases PubMed, Google Scholar and Scopus using the keywords "moist wound dressing", "diabetic gangrene", and "wound care"". There are a total of 4 articles that fit the inclusion criteria and are processed in qualitative synthesis. The characteristics of each article included in the qualitative synthesis are described in table 1. Articles that discuss wound care with moist wound dressing techniques are found in several online databases, especially on PubMed, Google Scholar and Scopus, but study that

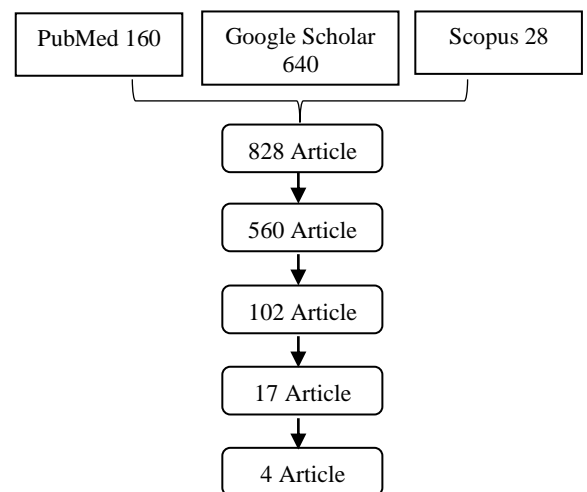
Conducted a search using appropriate keywords  
(*Medical Subject Heading*)

Specifics in the last 5 years (2011-2020)

Specifics in the last 3 years (2018-2020)

Results with Inclusion criteria

Results of Literature articles to be analyzed



**Figure 1.** Literature review Search Framework

articles that specifically discuss wound care with moist wound dressing techniques for wound dressing in diabetic gangrene patients are still limited. This review summarizes the results of research on several subjects. The subject consisted of diabetic gangrene patients. The first article shows that based on the results of data analysis of the wound dressing process experienced by respondents undergoing modern dressing treatment in the intervention and conventional treatment in the control group with 15 respondents, it can be seen that the wound dressing process in respondents after modern dressing. In the intervention group with healthy tissue as many as 8 respondents (53.3%), wound regeneration as many as 7 respondents (46.7%) and in the conventional control group with the

category of wound regeneration as many as 15 respondents (100%).

The second article showed that the physical domain in the intervention group before and after modern dressing treatment obtained an average difference of -0.72, meaning that between before and after there was an average increase of 0.72. The psychological domain in the intervention group before and after modern dressing treatment obtained an average difference of -0.83, meaning that between before and after there was an average increase of 0.83. The social domain in the intervention group before and after modern dressing treatment obtained an average difference of -0.61, meaning that between before and after there was an average increase of 0.61.

**Table 1. Results of Literature Reviews**

No	Author (year)	Title	Purpose	Method & Sample	Intervention	Research results	Conclusion
1.	Subandi and Sanjaya (2020)	The Effectiveness of Modern Dressing Against the Wound Healing Process of Type 2 Diabetes Mellitus	Analyze the effectiveness of modern dressings on the healing process	This study used the Quasy Experimental design with a Pre-Posttest With Control Group approach & a sample number of 15 people with type 2 diabetes	Provides modern intervention on dressings on the wound healing process of type 2 diabetes.	This study showed that there were differences in pre- and post-wound scores in the treatment group and in the dick group	Modern dressings have effectiveness against the process .
2.	Situmorang and Yazid (2021)	Wound Care with Modern Dressing on the Quality of Life of Diabetic Ulcer Patients at Asri Wound Care Center Medan Helfrida	Knowing the effect of wound care with modern dressings on the quality of life of diabetic ulcer patients at Asri Wound Care Center Medan Helfrida	Correlation and sample descriptive research, namely 30 respondents with diabetic ulcers who went to Asri Wound Care Center Medan with total sampling technique	Providing wound care with modern dressings to the quality of life of diabetic ulcer patients	This study shows that there is a significant difference in improving the quality of life before and after wound care using modern dressing at Asri Wound Care Center Medan	Wound care with modern effective dressings improves the quality of life of diabetic ulcer sufferers at Asri Wound Care Center Medan Helfrida
3.	Sitohang and Harahap (2019)	The Effect of Using Modern Dressings on the Diabetic Wound Healing Process at the Asri Wound Care Center Clinic in Medan	Knowing the Effect of Using Modern Dressings on the Diabetic Wound Healing Process at the Asri Wound Care Center Medan Clinic	This study used an analytic descriptive design with the design "One Group pretest posttest" & a sample of 30 respondents with diabetes mellitus who were on an outpatient basis at the Asri Wound Care Center Clinic	Providing modern dressing (Foam) in the process of healing diabetic wounds at the Asri Wound Care Center Clinic	The results in the study indicate that there is an effect of modern wound dressings on the healing process of diabetes mellitus wounds and that treatment must be carried out routinely according to the wound care schedule.	There is a decrease in the average wound healing process before and after using modern dressings
4.	Rukmi (2018)	The Effect of Modern Dressing Implementation on the Quality of Life of Diabetic Ulcer Patients	Knowing the Effect of Modern Dressing Implementation on the Quality of Life of Diabetic Ulcer Patients	This study has a pre-experimental design with a one-group pre-post-test design & a sample of 17 respondents from Griya Clinic Wound Care Center	Providing wound care with modern dressings on the Quality of Life of Diabetic Ulcer Patients	The results showed that there was a significant difference between the quality of life before and after Wound care was performed, with an average change in quality of life score of 13 points	Wound care with modern dressings can improve quality of life, as seen from the increase in the results of calculating the quality of life in patients with diabetic ulcers.

The environmental domain in the intervention group before and after modern dressing treatment obtained an average difference of -0.44, meaning that between before and after there was an average increase of 0.44. So the researchers concluded from the results of the research that has been done, there is an effect of wound care with modern dressing methods on the quality of life of diabetic gangrene patients in the intervention group.

The third article shows that the average wound dressing process before and after the use of modern dressings decreases. Where the average before is 34.5 and after 26.9. the average difference was 7.6 with a difference of 5.9 to 9.9 (95% confidence interval of the difference). So the researchers concluded that there was an average decrease in the wound dressing process before the use of modern dressings.

The fourth article shows that the characteristics of the wound condition before modern dressing treatment are 2nd degree (58.8%), with a yellow base (41.2%), a large amount of exudate (70.8%) and positive signs of infection (64.7%). While the characteristics of the wound condition after modern dressing treatment are 2nd degree (58.8%), with a red base (88.2%), moderate exudate (58.8%) and no signs of infection (0%).

So it can be concluded that there is wound repair after modern treatment of dressing. Likewise, the quality of life score was obtained before modern dressing treatment the average was 65.88 and after modern dressing treatment the average became 78.76. So researchers concluded that there is an effect of wound care with modern dressings in improving the quality of life of diabetic gangrene patients.

## **DISCUSSION**

The strict setting of criteria on the method greatly affects the number of articles obtained. The determination of the article taken initially by entering the word lock for each variable that has been selected according to MESH (Medical Subject Heading) then a search is carried out using google scholar After seeing that the number of articles obtained is limited, the criteria for taking further articles, specific in the last 5 years, the results obtained are still too broad to determine articles that can be used. Because it is felt that the results obtained are still too much to be determined, then specified again in the last 3 years. The results of articles obtained from searches by entering keywords and specific in the last 3 years are taken and analyzed which ones meet the inclusion criteria and can be used as articles to be used, with reference to

articles related to wound care interventions using modern dressings for diabetic wound dressing. After lowering the criteria in the form of research methods, finally 4 articles were obtained. The results are in line with the results of the research in the article, the results of the study generally state that the method of wound care with modern dressing has indeed proven to be significantly able to help the wound dressing process through the mechanism of the average occurrence of wound dressing process and increasing the quality of life of diabetic gangrene wound patients after treatment with modern dressing methods. Wound dressing is influenced by several factors. Some of the factors that affect wound dressing are immunological or immune status, blood sugar levels, wound rehydration and washing, nutrition, blood albumin levels, oxygen supply and vascularization (Kartika, 2015).

The method of wound care that is developing today is using the principle of moisture balance, which is said to be more effective than conventional methods. Wound care using the principle of moisture balance is known as the modern method of dressing (Kartika, 2015).

In its implementation, wound care to patients in this wound care practice uses the concept of modern wound care with the principle of moisture balance and

applies advance dressing. However, the patient will determine the material / dressing to be applied because this is related to financing. Wound care given to patients should be able to improve the process of wound development (Handayani, 2016).

The treatment provided is to provide warmth and moist environment (moist) to the wound. Moist conditions on the wound surface can enhance the process of wound development, prevent tissue dehydration and cell death. (Handayani, 2016). Other studies also state that a humid environment can accelerate the inflammatory response, resulting in faster cell proliferation (Nabila, Efendi and Husni, 2013).

In a humid atmosphere cell metabolism will be better because more water, nutrients, and vitamins are available. The moist mood effect can prevent tissue dehydration, cell death, accelerate angiogenesis, increase the breakdown of dead tissue and fibrin, and reduce pain during medication (Nabila, Efendi and Husni, 2013). Another type of modern dressing, Ca Alginate, contains Ca can help stop bleeding. Then there is hydrocellulose which is able to absorb twice as much liquid as Ca Alginate. Next is a hydrocolloid that is able to protect from water and bacterial contamination, can be used for primary and secondary

dressing. The use of modern types of dressings is adapted to the type of wound. For wounds with a lot of exudate, a dressing material is chosen that absorbs liquids such as foam, while for wounds that have begun to grow granulation, gel is given to create a moist atmosphere that will help accelerate wound dressing (Kartika, 2015). The results of research from Subandi and Sanjaya (2020) stated that there is still a diabetic wound rate in the community as much as 15%. Indicating that people still do not understand the existence of proper wound care and some people choose conventional wound care because it is easy to obtain tools and materials, can be done independently, while this technique has quite a lot of negative impacts such as high risk of infection, quick dry dressing, risk of causing new wounds and odorous dressings. In contrast to modern dressings that rely on moisture for the wound dressing process with the excess of absorbing exudate well, not smelling, effective hospital treatment. Therefore, the treatment method must be in the nature of maintaining moisture and maintaining warmth in the wound. Modern treatment methods have a working principle by maintaining moisture and warmth of the wound area (Handayani, 2016).

Based on the article about modern dressing that has been described above,

the author considers that the use of modern dressing material is very good to be used in the healing process of diabetic gangrene, especially like the experience experienced by the author himself in treating gangrene patients, Where the treatment carried out in preventing infection needs to be done repeatedly by changing the bandage and cleaning the wound area so that the wound remains clean so that it can help the wound dressing process This is certainly directly proportional to the principle of modern dressing care, namely moisture balance. Where the results that can be found when the principle of moisture balance is applied in the treatment of gangrenous wounds repeatedly, it will make it easier for nurses to open the bandage and prevent damage to newly grown tissue due to the attachment of tissue in a dry dressing as commonly experienced in conventional wound care.

Articles about the implementation of wound care with modern dressings on diabetic wound dressing are still not much, but the evidence found from the article is strong enough because the articles displayed are published articles from good, official literature and have been peer reviewed before publication The quality and evidence presented in the article are quite strong, it's just that further research is still needed with more human



samples and to prove the effectiveness of implementing wound care methods with modern dressings on diabetic wound dressing in human samples. Although the number of articles looking at the effect of modern dressing wound care interventions on diabetic wound dressing is still small, modern dressing wound care interventions have great opportunities to be practiced in clinical and community settings, especially in Indonesia. This condition is supported by the many advantages of wound care with modern dressings more economical, easy to use, does not cause addiction, can be used at any time and has no side effects when given to patients who do diabetic wound care. Further research needs to be done on more human samples in different countries with different cultural characteristics. The selection of wound care sites with modern dressings has an important role because there are nerve pathways so it needs to be a concern so that wound care with modern dressings can work more optimally

## CONCLUSION

The results of the literature review show that wound care with modern dressings is proven to be able to help heal diabetic wounds. The materials used in the treatment of wounds with modern dressings are easy to obtain, easy to use,

economical, non-addictive, can be given at any time and have minimal side effects for the patient. With so few research results using the best research methods conducted on humans, further research with better quality will greatly assist the process of developing modern wound dressing methods to be practiced in Indonesia. This study can be corrected as a guide in providing wound care methods with modern dressings for healing diabetic wounds

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