EFFECTIVENESS OF MODERN DRESSING IN DIABETIC ULCER: CASE STUDY

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ABSTRACT

Diabetic ulcer wound care has changed from conventional to modern wound care based on the principle of moist balance. Modern dressing can heal diabetic foot ulcers faster and inexpensive. This research conduct effectiveness of modern dressing in diabetic ulcer. This study used dressing that contain hydrogel, chitosan and zinc oxide. Each diabetic patient given three times wound care, once every day for three day and evaluate with Bates-Jansen Wound Assessment before and after intervention. The results is each patient reduces scores in the BWAT assessment from 46 to 37 in first patient, 52 to 48 in second patient and 37 to 30 in third patient. Based on results using modern dressing methods proven reduce ulcer size in each patient, ease pain, less exudate, and reduce inflammation signs. This method can be used for further research by combine more than one type of primary dressing, manage blood glucose by diet and medication program, and involve family in wound care.

Keywords: Modern Dressing, Treatment of Foot Ulcers, Diabetes Mellitus.

INTRODUCTION

Type 2 DM is a disease that is known and occurs in the general public, those aged more than 30 years. This type of diabetes occurs due to insulin resistance which results in blood sugar levels increasing, so that it cannot enter the cells, then over time it will accumulate in the bloodstream. (PERKENI, 2021). One of the complications of DM is neuropathy, both peripheral, autonomic (unconscious movements), motor (conscious body movements) and sensory nerves (unable to detect sensations in the body, for example pain, heat, and pressure in the body) which can causes disorders in the body, especially in the lower extremities. (Komariah, 2022)

Diabetes for developing and developed countries is a serious problem in the world. WHO (World Health Organization), as many as 415 million people in 2015 had diabetes, and it is estimated that this will increase to 642 million people in 2040 (Asociación Americana de diabetes, 2023). The Diabetes Atlas in 2019 estimates that 424.9 million people suffer from diabetes, this figure exceeds the entire population of Indonesia. In 2017, Indonesia was ranked 6th in the world, from several developed countries in the world such as India, the United States, China, Russia, Brazil and Mexico, with the number of sufferers being approximately 10.3 million and then the number increased to 16. 7 million in 2045 (Subandi & Sanjaya, 2019). Research conducted by the IDF (International Diabetes Federation) shows that around 85-95% of type II diabetes mellitus cases in the world are suffered by adult patients. From 2007 to 2025, the overall prevalence of type 2 diabetes mellitus and IGT (Impaired Glucose Tolerance) increased based on age from 6% to 7.3% and 7.5% to 8%. Meanwhile, between the ages of 20 and 79 the total population increases from 246 to 380 and from 308 to 418 million. (IDF, 2021)

In Indonesia, around 15% of people with diabetes have gangrene, especially in the lower extremities. In diabetic foot ulcer patients, between 14 and 24% require amputation. As for the number of DM sufferers found in Palembang City (South Sumatra) in 2022, there were 434,461 DM sufferers. This case has increased compared to 2021, when 279,345 people suffered from DM. So it can be confirmed that

Palembang City is the region with the highest number of diabetes mellitus cases, around 112,112 cases. (South Sumatra Riskesdas, 2023).

Based on the current situation, it is still found that around 15% of sufferers suffer from diabetic wounds, where there is still a lack of awareness regarding the correct and appropriate care of diabetic wounds in particular. In the treatment of diaberic ulcer wounds, with the times, there has been a very rapid change from conventional wound care to modern wound care. The principle in wound care using modern techniques is that wound moisture is the main concern, so wound dressings using modern dressing techniques are more effective in accelerating wound healing in DM sufferers. . According to a number of studies, wound care using modern dressing methods is more efficient and better than conventional methods because wound care using modern methods is based on the balance of wound moisture (Komariah, 2022). According to research by Dina Dewi et.al (2009) in (Angriani et al., 2019) stated that wound care using modern dressings is more effective than wound care using conventional dressings where the progress of wound repair is more significant and better. Likewise, research conducted by Colin (Colin & Listiana, 2022) stated that healing diabetic ulcer wounds using modern and conventional methods was equally effective, however, wound care using modern treatments showed faster healing results for diabetic ulcer wounds.

The modern dressing technique itself is a method of maintaining moisture in the wound area to accelerate the growth of new tissue by using several types of modern dressings according to the condition of the wound. A moist wound surface can keep the wound from being contaminated by bacteria, so that the wound healing process will increase and prevent dehydration of the wound tissue and cell necrosis. Basically, this treatment method is enhanced by growth factors, neutrophils, fibroblasts, proteases and macrophages. Currently, there are around 500 types of dressings available to treat patients with chronic wounds which are adapted to the condition, wound problem and severity of the wound according to the capabilities of each dressing, including hydrogel, film dressing, hydrocolloid, calcium alginate, foam dressing/ absorbent, antimicrobial dressing, hydrophobic antimicrobial (Kartika, 2015). Current wound care boards generally focus on the type of dressing in injury treatment selected with consideration of cost, comfort and safety. antimicrobial (Hutagalung & et al, 2023). Current wound care management always prioritizes the type of dressing in wound care that is selected based on considerations of cost, comfort and safety.

Diabetes Mellitus is a hormonal disorder which is caused by metabolic abnormalities which can affect hyperglycemia on blood sugar tests which causes chronic complications in the blood vessels and nerves, eyes and kidneys (Insane, 2021).

According to Putri (2020) in (Ahmady, 2023) open wounds are known as ulcers, which occur on the surface of the skin and on the mucous membranes, and ulcers can be interpreted as dead tissue, which is large and accompanied by the presence of saptophyte bacteria. The characteristic odor of gangrene in diabetics is caused by germs, diabetic ulcers are also clinical symptoms of diabetes mellitus as a complication of peripheral neuropathy. In treating chronic wounds, things that need to be considered are (Tholip Ali, 2016): 1) Carrying out ongoing wound assessments, 2) Preparing the wound base, which consists of 3 M (washing the wound, removing dead tissue, choosing the right topical/dressing) , 3) Principles of wound care/handling using sterile and non-sterile principles, 4) Improving the patient's quality of life, 5) Providing knowledge about health to families and patients regarding diabetic wound care, 6) Improving the patient's daily health activities/patterns days until reaching optimal capabilities. Complications from poor wound care are: Wound healing takes longer, formation of hypertrophic scars (keloids), infection, abscesses, cellulitis, sepsis.

The management of modern dressings focuses on 3 things, including: eliminating the cause of the wound (pressure, shear, friction, moisture, neuropathy), creating systematic support (nutrition and fluid, edema, GDS), and creating and maintaining the wound environment (preventing infection, cleanliness of wounds, dead tissue, moisture, etc.). Modern wound care dressings have the principle of maintaining wound moisture using materials such as hydrogel and can be applied for 2-3 days. The benefits and objectives of Modern Dressing wound care are that the wound does not become dry and hard, Makes the wound grow new tissue/red granulation, Prevents the wound from growing dry or dead tissue, Increases the formation of the dermis, Accelerates the healing process of infected wounds and reduces incidence of infection and reduces pain when changing the dressing. (Agustuti & Alyupiudin, 2019.)

METHODS

This research is a type of descriptive research that describes the implementation of nursing care related to the application of Modern Dressing wound care using a case study approach, which aims to speed up the healing process of diabetic foot ulcers. This research was conducted on clients with integument system disorders, namely diabetic foot ulcers and was carried out in May 2024, the subjects in this case study were 3 respondents who had diabetic foot ulcers. The instrument used in this research was a medical-surgical nursing care format and used a BWAT scale observation sheet consisting of 13 items to assess wound development.

RESULT AND DISCUSSION← 13pt, Arial, Bold, UPPERCASE

General Organization of the Paper ← 12pt, Arial, Bold, Capitalize Each Word

The results of this research with a sample size of 3 clients conducted during 3 meetings with assessments using the BWAT scale were obtained.

Table 1. Bates-Jansen Wound Assessment Tool

No	Item	Patient 1				Patient 2				Patient 3			
		A	D1	D2	D3	A	D1	D2	D3	A	D1	D2	D3
1	Wound size	5	5	5	5	4	4	4	4	2	2	2	2
2	Depth	3	3	3	3	4	4	3	3	2	2	2	2
3	Periwound	4	3	2	2	4	4	4	4	4	4	3	2
4	Undermining	3	3	3	3	3	3	3	3	2	2	1	1
5	Necrotic type tissue	3	3	2	2	4	4	3	3	1	1	1	1
6	Necrotic tissue amount	4	3	2	2	5	4	4	4	1	1	1	1
7	Exudate type	5	5	4	4	5	5	5	5	4	4	4	4
8	Exudate amount	3	3	3	3	4	4	4	4	3	3	2	2
9	Colour of periwound	4	4	4	3	4	4	4	4	5	4	4	4
10	Edema	1	1	1	1	4	4	3	2	2	2	1	1
11	Edge tissue hardening	1	1	1	1	1	1	1	1	2	2	2	2
12	Granulate tissue	4	3	3	2	5	5	4	4	5	5	4	4
13	Epitheliazing	5	5	5	5	5	5	5	5	5	5	5	5
	Jumlah Skor	45	42	37	36	52	51	49	48	38	37	32	31

A: Assessment, D1: Day 1, D2: Day 2, D3: Day 3

Based on the results of the implementation that was carried out on 3 clients who underwent wound care every 3 days and lasted for 3 meetings using a type of Hydrogel made from Chitosan and Zinc Oxide in collaboration with foam dressing, the results were obtained in table 1, with a score for client P1 before given wound care was 45 and after being given wound care became 36, the score of client P2 before being given wound care was 52 and after being given wound care became 48, the score of client P3 before being given wound care was 38 and after being given wound care became 31, so it can be concluded that there is The increase in the wound healing process in the 3 patients in the application of modern wound care dressings was indicated by changes in scores on wound assessment using the BWAT scale during pre (assessment) and post (day 3).

Research that was carried out before and after applying modern wound care dressings to 3 clients, approximately 30 minutes for 3 days using the BWAT Scale assessment and application of wound care SOPs, resulted in changes in scores on the 13 items assessed. This proves that treatment using modern dressing methods is very significant in the wound healing process.

Before applying modern wound dressing treatment, the researcher carried out an assessment on client 1, namely where the client said that a month ago the sole of the right foot had a wound which then got bigger and the wound got worse and was emitting pus and a foul smell. After carrying out the assessment using the BWAT scale, the results of the study were obtained using score 45. In client 2, the client said the wound was in the area of the little toe of the right foot for approximately a week and over time the wound festered and had a foul smell. After an assessment was carried out using the BWAT scale, the results of the assessment were obtained with a score of 52. In patient 3, the client said there was a wound between the toes. left leg and had surgery 4 years ago, now the wound is emitting pus and smells, after an assessment was carried out using the BWAT scale, the results were obtained with a score of 38.

From the results of the assessment of these three clients, 3 nursing diagnoses can be established, however in this study the researcher only focused on one nursing diagnosis, namely impaired tissue integrity related to changes in circulation. The interventions provided are in accordance with evidence based practice in accordance with the outcome standards applied in modern wound dressing care. The implementation of nursing on clients is carried out in accordance with the nursing plan in the application of Evidence Based Practice (EBP) with application using the BWAT scale assessment. Meanwhile, the results of the nursing evaluation on clients were carried out in accordance with the implementation of Evidence Based Practice (EBP) nursing, where in the application of modern wound care dressings, things were found that influenced wound healing, including the patient's elderly age, unstable blood sugar levels and history of diabetes mellitus for many years.

This research is in line with research conducted by (Khoirunisa et al., 2020) with the title "The effect of modern dressings on the average wound healing score for diabetic ulcers" which states that modern dressings with hydrogel are able to reduce the average wound healing score with a significant p value of 0.000. . And research conducted (Hutagalung & et al, 2023) states that treatment using modern dressing methods accelerates the increase in healing of diabetic wounds compared to conventional wound care. Based on theory, related research and interventions that have been carried out, the researchers analyzed that modern wound care dressings are very influential in the healing process of diabetic wounds. Likewise, research (Dzaki et al., 2023) states that modern wound care dressings are effective for treating diabetes mellitus wounds. If modern wound care dressings are carried out longer and continuously, you will get maximum results in wound care.

CONCLUSION

Based on the results of the application of Evidence Based Practice (EBP), it can be concluded that the application of wound care using modern dressings is very effective in accelerating the wound healing process. This is proven by the BWAT assessment of the 13 items which found a change in score for each patient, including patient 1 on the first day at the time of the assessment before modern wound dressing was carried out, the score was 46, then after 3 wound treatments the score was 37. Patient 2 before having modern wound dressing treatment had a score of 52 after 3 wound treatments, the score dropped to 48, and patient 3 before having modern wound dressing treatment had a score of 37 after 3 wound treatments, the score was 30.

The results of this research can be used as material for further research regarding the application of modern wound dressing care, by using more than one primary dressing, for example, antimicrobial sorbact dressing, cutimed sorbact 2.8% which can be applied to chronic/acute wounds as well as infected wounds or risk of infection, by providing a thick foam dressing, making it possible to treat the wound not once a day but can be applied once every 2 or 3 days in providing wound care.

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