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Application Of Wound Dressing for Skin Integrity Disorders on A Ny S With Diabetic Ulcers in The a RS Iryou Houjin Aiwakai (Ikeda En) Okinawa Japanese Room

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ABSTRACT

Diabetic ulcers are one of the complications that can be experienced by people with type 2 diabetes mellitus due to damage to peripheral blood vessels and nerves. The prevalence of diabetes sufferers in Japan has recently increased, namely 11 million adults suffering from diabetes in 2021. Diabetes mellitus wounds easily develop into infections so wound care is needed. One treatment that can be done is wound care with Modern Dressing. Based on the results of a pre-survey conducted on January 22, 2023 at Houjin Aiwakai Hospital (Ikeda En), Okinawa, Japan, there were 3 patients suffering from diabetic ulcers. These findings aim to evaluate the impact of wound care using modern dressing methods on nursing care for skin integrity disorders at Iryou Houjin Aiwakai Hospital (Ikeda En), Okinawa, Japan. This research applies a descriptive method through a case study approach as an in-depth understanding of the nursing care process carried out. Data collection was carried out through direct observation, interviews with patients and medical personnel. The research was conducted on one patient who experienced impaired skin integrity on the heel of the left foot. The findings after nursing care within 3 days were that the damage to the skin layer had improved, the redness was still there and the area of the wound had decreased. This research provides important insights to improve nursing practice and management of diabetic ulcer patients, and can be a reference in developing more effective treatment strategies.

Keywords: diabetic ulcer, wound care, modern dressing

1. INTRODUCTION

Diabetic ulcers are a complication that can be felt by sufferers of type 2 diabetes mellitus due to damage to nerves and peripheral blood vessels. This complication occurs because blood sugar is not controlled and when it is severe it can cause damage that extends to the bone, so this needs to apply amputation measures, in poor blood circulation causing blood to not flow smoothly (Rahayuningtyas, 2019).

According to data from the International Diabetes Federation (IDF), the average number of people with diabetes worldwide is projected to reach 537 million by 2021, 643 million by 2030, and 738 million by 2045. Worldwide, 6.7 million people aged between 20 and 79 die each year from diabetes. By 2021, type 1 diabetes will affect more than 1.2 million children and adolescents, and the prevalence of impaired glucose tolerance will reach about 541 cases. Indonesia has the seventh highest percentage of diabetes patients in the world, with 10.7 million people affected (Widiyanti, 2020).

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Currently, there is a rapid development of diabetes in Japan. Based on IDF 2021 predictions, 11 million adults in Japan have diabetes. The high prevalence of diabetes is associated with a significant economic burden and can be attributed to lifestyle changes and increased longevity.

Two percent of all people with diabetes develop ulcers each year, and five to seven percent of those with peripheral neuropathy also develop ulcers (Detty et al., 2020). Bacteria and viruses can enter diabetic wounds and cause infection, which in turn leads to high blood sugar levels. Dehydration, hypoxia, low temperature, excessive discharge, necrotic tissue, repeated wound trauma, anemia, infection, and diabetic ulcerative wound care are some of the factors that affect wound healing (Rahayuningtyas, 2019).

Conventional wound care requires a long period of time for treatment because it has repeated trauma and bleeding due to frequent dressing changes (Amanda et al., 2021). The rapid development of wound care now provides a warm and moist environment for the wound. Moist dressings can provide an environment that encourages cells to implement wound healing efforts and prevent trauma and damage (Hidayat et al., 2021)

Modern dressing is an attempt to treat wounds through the defense of wound moisture and occlusive dressing closure. Modern dressings can heal wounds quickly, through accelerating granulation efforts in the tissue from several types of dressings applied, each dressing has advantages related to wound healing (Cumatunaro et al., 2020)

Wound care provides wound moisture defense through several dressing efforts tailored to the wound that can heal quickly. Wound care through Metronidazole based on good techniques and procedures such as opening the dressing, observing the wound, washing the wound, applying debridement and then re-cleaning through moist gauze and NaCl and Metronidazole can facilitate the healing of diabetic ulcers.

According to the pre-survey applied on January 22, 2023 at Houjin Aiwakai Hospital (Ikeda En) Okinawa Japan, there were 3 patients suffering from diabetic ulcers. The wounds suffered by the 3 patients had different wound condition problems. In one of the diabetic ulcer patients, there were more severe problems with grade 1, namely *superficial* diabetic ulcers (partial or *full thickness*). The ulcer is on the heel of the left foot without xudate, the skin around the ulcer is slightly edematous, pink in color with minimal inflammation. The management of diabetic ulcer wound care at Ikeda En hospital is the *wound dressing* method. So that the author is interested in raising a nursing care case with the title "Nursing care for tissue integrity in Mrs. S with diabetic ulcers in room A of the Iryou Houjin Aiwakai (ikeda en) hospital Okinawa Japan"

2. RESEARCH METHODS

This final project research design applies a case study design. Case studies were chosen because they are specialized in assessment, data analysis, diagnosis, intervention, implementation and evaluation in carrying out nursing care. This study uses a sample of one patient with subject criteria, namely, the patient is willing to be a subject, the patient through the main nursing problems of skin integrity disorders.

In an effort to collect data, the author conducted a patient assessment. The assessment method that the author applies is observation and interviews in the wound area through building a trusting relationship. After obtaining assessment data, the author then determines nursing diagnoses, nursing plans, nursing interventions and nursing evaluations.

The wound assessment process is performed every time the wound dressing is changed. Wound assessment includes: degree of tissue damage, size, wound edges, surrounding skin, signs of infection and pain. During wound care, several materials such as Dermafix T and Azunoru ointment are used. The reason for using Dermafix T wet dressing creates a moist environment that can help soften necrotic tissue, thus facilitating the process of dead tissue removal. Azunoru ointment is used because it accelerates wound healing.

3. RESULT AND DISCUSSION

Assessment

According to Arsa (2020) assessment in the nursing process includes the first step of all nursing processes which aims to find patient information in the hospital. In diabetic ulcer patients, the assessment focuses on the patient's medical history and physical examination of the patient in the form of activity and rest, circulation, pain or comfort, breathing and safety.

Based on the results of observations in Mrs. S applied on January 22, 2023, patient data was found Mrs. S is a 72-year-old patient who works as a teacher and lives in Nishihara. The patient said the wound hurt. According to Doenges *et al*, (2023) skin integrity disorder is a condition in which the skin structure is damaged, thus disrupting its protective function. In the case proven by the results of Mrs. S's assessment, it shows that on physical examination, a superficial wound was found with the depth of the wound reaching the epidermis and dermis layers, accompanied by superficial necrosis. The wound appeared clean, without purulent exudate and odorless on the heel of the patient's left foot. Medical history showed that Mrs. S had developed diabetes mellitus at the age of 50.

Information showing damage to skin integrity was obtained from the evaluation results. This data shows the relationship with skin-related nursing disorders. There were complete data (100 percent), significant data (50 percent), and minor data (50 percent). Damage to skin integrity was shown in the first data set, pain and redness in the second data set, and complete in the third data set.

Table 1. Data Analysis of Nursing Care for Skin Integrity Disorders in Patients with Diabetic Ulcers

No	Subjective and Objective Data	Analysis	Nursing Problems
1.	Subjective data: The patient complained of pain on the heel of his left foot Objective data: There was a superficial wound with the depth of the wound reaching the demis and epidermis, accompanied bu superficial necrosis. The wound was clean, with no exudates and no odor on the heel of the patient’s left foot	Diabetes mellitus ↓ Insulin resistance ↓ Hyperglycemia ↓ Microvascular disorders ↓ Peripheral neuropathy ↓ Wound ↓ Wound contaminatedwith microorganisms ↓ Impaired skin integrity	Impaired integrity

Nursing Diagnosis

The problems discussed here are real problems, based on a review of the data previously provided. Therefore, the nursing diagnosis method follows the Indonesian Nursing Diagnosis Standard which outlines the problem, its causes and accompanying symptoms.

Impaired skin integrity (D.0192) is a major problem that needs to be considered by nurses caring for patients with peripheral neuropathy, which is a condition that visually manifests in the form of symptoms and signs such as damage to tissues and skin layers. Damage to the skin (dermis and epidermis) and tissues (cornea, mouth, hands, feet, and appendix), according to the SDKI Working Group Team (2017), is the root cause of integrity disorders.

According to Doenges *et al*, (2023) skin integrity disorder is a condition in which the structure of the skin is damaged, thus disrupting its protective function. This damage can lead to various health problems, such as infection, dehydration, and impaired thermoregulation. The causative factors can be external (trauma, infection, burns) or internal (aging, chronic disease, malnutrition). Skin integrity disorders are characterized by major symptoms and signs such as: damage to tissues and skin layers. Minor symptoms and signs include redness, pain, bleeding, hematoma and redness.

The reason this diagnosis was raised was because there was damage to the skin layer on the heel of Mrs. S's left foot due to complications of diabetes experienced by Mrs. S, namely diabetic ulcers. This diagnosis is important to ensure proper wound care to prevent further infection and promote healing.

Nursing Plan

After determining the correct nursing diagnosis in the patient, the researcher then establishes a nursing plan. The care plan prepared by the nurse must be harmonized with the patient's condition in accordance with the study and nursing diagnosis (Simanullang, 2019).

Determination of the objectives and outcome criteria of Mrs. S's patient in accordance with the Indonesian Nursing Outcome Standards (SLKI), namely after applying the action within 3x24 hours, the hope that the integrity of the skin and tissues (L.14125) in the patient has improved, through the outcome criteria: decreased skin layer damage, decreased necrosis, decreased redness.

The interventions that the author plans are in accordance with the Indonesian Nursing Intervention Standards (SIKI), namely wound care (I.14564), because to prevent infection, accelerate wound healing and prevent complications. This is in line with the findings of Setiyaningrum *et al.,* (2023), where wound care is an effort to remove callus tissue and local infection, remove necrotic tissue so that it can heal quickly. The findings of Br Ginting, (2024), wound care methods with *modern dressings* affect the wound healing process of diabetes mellitus patients and are stated to be more effective than using other methods.

Nursing Implementation

Nursing implementation that has been carried out according to the selected intervention. Actions taken by the author on the first day included: monitoring wound criteria, gently removing plasters and dressings, monitoring signs of infection, cleaning wounds with NaCl and soap which has a mild antiseptic effect that can help reduce the number of bacteria in the wound so as to prevent infection, cleaning necrotic tissue, administering ointments and applying wet dressings using Dermafix T by maintaining sterile techniques.

Actions taken on the second day include: encouraging patients to increase rest, as well as collaboration in the administration of oral antibiotic drug therapy (Levofloxacin 2 x 500mg) and the administration of topical drug therapy Azunoru ointment 2 x to taste.

The actions taken on the third day were to monitor wound characteristics, provide wound care using *modern dressings* with wet *dressing* techniques because wet dressings create a moist environment that can help soften necrotic tissue, thus facilitating the process of removing dead tissue. The moist environment also supports new cell growth and granulation tissue formation which is an important stage in wound

healing. Apply Azunoru ointment and apply a wet dressing using Dermafix T while maintaining sterile technique.

The author's actions were based on findings from *Dzaki et al.,* (2023), which showed that the implementation of appropriate wound care can significantly improve the integrity of the patient's skin. In addition, research by Br Ginting, (2024), supports the use of *modern dressings* in the wound healing process of patients with diabetes mellitus and is stated to be more effective than using other methods.

Moisture preservation, temperature regulation, and protection from harm are the three main purposes of traditional and contemporary dressings. On the other hand, traditional dressings are not so good at retaining moisture as the gauze will dry out due to NaCl loss. The wound is more likely to become infected again when the environment is dry as the gauze sticks more firmly to the wound. Wound care takes longer when gauze is not used for environmental moisture management. Wounds can heal faster with the help of modern dressings. As a principle of wound care, moisture balance is now used in modern dressing practices. This is how people dress today.

In a healthy non-cellular matrix, cell growth and collagen proliferation can be enhanced in a pH- and moisture-balanced environment. Hydrocolloid dressing (autolytic debridement) softens and destroys necrotic tissue without damaging the surrounding healthy tissue, creating an ideal healing environment that is still moist. This is in accordance with research findings by Keast (2008) and Jeffcoate and Harding (2003), who detailed the role of wet suits among other variables in diabetic foot ulcer recovery (Irwan *et al.,).* 2022

Nursing Evaluation

Table 2. Nursing evaluation in diabetic ulcer patients

Indicator	Day 1			Day 2			Day 3		
	Initial	End	Now	Initial	End	Now	Initial	End	Now
Damage to skin layers	3	5	3	3	5	4	3	1	4
Redness	3	5	3	3	5	4	3	1	5
Nekrosis	3	5	3	3	5	4	3	1	5

Description:
1: Increased
2: Moderately improved
3: Medium
4: Decreased enough
5: Declinin

Evaluation of the first day in nursing problems related to skin integrity disorders in peripheral neuropathy can be partially resolved with the data obtained as follows: Mrs. S complained that the wound was painful. On physical examination, superficial wounds were found with wound depth reaching the epidermis and dermis layers, accompanied by superficial necrosis. In the table of indicators of skin integrity disorders, there were still moderate complaints in the indicators of skin layer damage, redness, necrosis. The results of the second day's evaluation helped the nurse address the problem of impaired skin integrity due to peripheral neuropathy to some extent: The wound on Mrs. S's leg had started to heal. Although there was still some inflammation, the wound was showing signs of healing with the growth of new tissue.

Evaluation of results according to nursing care problems within 3 days, the nursing problem of impaired skin integrity in patients is

partially resolved. This can be seen from the growth of new tissue in the wound, although redness is still visible. The patient will be transferred to room B to continue wound care. In room B, the nurse will provide pharmacological techniques to the patient

In accordance with previous studies, this study found that moist wound dressings helped to resolve skin and tissue integrity disorders by the third day of evaluation. There was partial resolution of the problem of deterioration of skin and tissue health, with objective data showing that tissue breakdown, skin layers, bleeding, hydration and necrosis did not worsen.

From both results, there are several aspects of the wound that heal more slowly, as wound healing has several stages, including inflammation (characterized by redness, swelling and heat). Even though the exudate is gone, the blood vessels in the wound area are still actively working to repair the damaged tissue. This causes the reddish color.

CONCLUSION

This therapy was carried out 3 times in 3 days, each time the dressing was changed the researcher conducted a wound assessment. This study shows that wound care with *modern dressings* can improve skin and tissue integrity. For nursing knowledge and technology, it is hoped that wound care techniques with modern dressings will be applied in clinical practice to improve the quality of nursing implementation of wound care in diabetic ulcer patients with skin integrity problems. The limitation in this study is the very small number of respondents so that it does not strengthen the results because there is no comparison.

ADVISE

Families play an important role in supporting the healing process by being actively involved in care. By following the doctor's instructions, keeping the wound clean, and getting support from the family, patients can accelerate the wound healing process and improve their quality of life. Families should learn proper wound care procedures, monitor wound conditions regularly, and be emotionally supportive to the patient. Collaboration between the patient, family, and healthcare professionals is necessary to realize maximum treatment results.

Patients are advised to follow diabetic ulcer care instructions consistently to accelerate healing and reduce the risk of complications. Future researchers are expected to be able to apply the latest treatments for diabetic ulcer wound care according to the criteria and wound conditions.

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