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Description of the Application of Red Fruit Oil Ointment to Heal Grade 2 Diabetic Ulcers in Toyareka Village

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ABSTRACT

Background: Diabetic ulcers are one of the serious complications of diabetes mellitus that can lead to disability and amputation. Management of diabetic ulcers requires proper wound care to accelerate healing and prevent infection. One alternative used is red fruit oil ointment (pandanus conoideus oil), known to contain antioxidants and active compounds potentially accelerating wound healing. **Objective:** To describe the application of red fruit oil ointment in the healing of grade 2 diabetic ulcers in Toyareka Village, Kemangkon District, Purbalingga Regency. **Method:** This study used a case study method on one respondent with a grade 2 diabetic ulcer. Treatment was conducted over 14 days with application of red fruit oil ointment every two days. Data analysis in this case study was performed using a descriptive approach. Data were collected through interviews, direct wound observation and documentation of score using the Bates Jensen Wound Assessment Tool (BJWAT). **Results:** There was an improvement in wound healing, indicated by a decrease in the wound score from 44 to 28 after seven applications. This improvement was marked by increased tissue granulation, epithelization, reduce wound size, and enhanced tissue integrity. **Conclusion:** Application of red fruit oil ointment effectively accelerates the healing of grade 2 diabetic ulcers.

1. Introduction

Diabetes Mellitus (DM) is a disease typically experienced over a prolonged period and can gradually lead to fatal outcomes. A characteristic feature of individuals with Diabetes Mellitus is a hyperglycemia, a condition in which blood glucose level increase due to a reduction in insulin production by the pancreas[1].

Moreover Diabetes Mellitus can also be defined as a condition characterized by elevated blood glucose levels resulting from the pancreas inability to produce sufficient insulin required by the body [2]. Diabetes Melitus is classified into four categories: Type 1 DM, Type 2 DM, Gestational DM, and other specific types. Type 2 Diabetes Mellitus (accounting for 85-95% of cases) is the most common

form worldwide, characterized by impaired insulin secretion and insulin resistance. The World Health Organization (WHO) predicts a substantial increase in the number of individuals with Type 2 DM in the coming years [3].

In the 10th edition of its Atlas, the International Diabetes Federation (IDF) states that diabetes mellitus is one of the most common health problems, with the fastest growth in 20th century. Globally, more than half a billion people specifically 537 million are living with diabetes mellitus. This number ia projected to rise to 643 million by 2030 and further increase to 783 million by 2045. In Indonesia approximately 19,47 million people have diabetes mellitus, placing the country fifth in the world for the highest number of diabetes cases. Consequently, the prevalence of diabetes mellitus in Indonesia reaches 10,6% of the total population of 179,72 million people [4]. In Central Java Province alone, the number of diabetes mellitus cases in 2021 was 618,546 and in Purbalingga Regency recorded 13,117 cases in the same year [4]

One of the complications of diabetes mellitus is diabetic foot ulcers, which are estimated to occur in approximately 15% of all individuals with diabetes. This complication is a major reason for hospitalization and a contributing factor to the increased incidence of non-traumatic amputations. The Global Lower Extremity Amputation Study Group estimates that diabetes mellitus accounts for 25-90% of amputation cases. According to the International Diabetes Federation *(IDF)* [4], 387 million people worldwide were living with diabetes. This number was projected to increase to 529 million in 2022, representing a 53% rise. At least 463 million individuals aged 20 to 79 years are affected by diabetes globally.

The prevalence of diabetic ulcers in the general poulation within the same age group is 6,3%. Epidemological studies in China report a prevalence of foot ulcer ranging from 5-10%, with an incidence rate of 6,3%. Prevalensi ulkus diabetikum pada populasi umum pada kelompok usia yang sama adalah 6,3%. In Indonesia, the prevalence of diabetic ulcers is approximately 15%, with an amputation rate 30% and a mortality rate of 32%. Diabetic ulcers are a major cause of hospitalization, accounting for 80% of all diabetes related admissions. They occur in 15-25% of patients with diabetes and ij 5-7,5% of patients with neuropathy, with an annual incidence rate exceeding 2% [5]

After judging from the prevalence data above regarding diabetic ulcers, it makes it a challenge for health workers, especially nurses, in carrying out appropriate treatment for diabetic ulcers, namely in treating wounds in diabetic ulcers. The need for proper wound care in diabetic ulcer patients is aimed at reducing or delaying the occurrence of complications.

Based on the prevalence data above regarding diabetic ulcers, this condition presents a particular challenge for healthcare professionals, especially nurses, in providing appropriate management for patients with diabetes mellitus, particularly in wound care for diabetic ulcers. Proper wound care is essential to reduce or delay the occurrence of complications.

Currently, advances in science and technology have significantly contributed to the development of wound care. Enhancing wound healing is a crucial aspect to consider in providing effective treatment. Various wound care techniques can be applied, one of which is the modern dressing technique. This approach provides warmth and maintains moisture in the wound area. The presence of moisture in the wound dressing plays an important role in facilitating the cellular processes of wound healing and can slow down or even prevent further tissue damage [6].

In wound care procedures, the materials used should be of the highest quality. One type of material that can be utilized is red fruit oil ointment (Pandanus conoideus oil). This ointment is made from red fruit, which is commonly found in the Papua region, an area still rich in dense forests. The local community believes that red fruit has the potential to treat various degenerative diseases. Red fruit contains bioactive compounds with antibacterial properties, including phenols, flavonoids, steroids (triterpenoids), tannins, and saponins [7].

The use of red fruit oil ointment is believed to help maintain skin moisture and prevent irritation. This ointment is also recognized as the first formulation developed from red fruit oil, offering a more appealing appearance. Generally, it is used by the community as a topical medication for external wounds, applied directly to the affected area, providing a practical method of treatment [8].

The study conducted by[9], demonstrated that wound care for diabetic ulcer patients using the modern dressing method with red fruit oil ointment (Pandanus conoideus oil) was able to accelerate ulcer healing, as evidenced by a reduction in wound size from 3 × 3 cm to 2 × 2 cm. This finding is consistent with research by [8], which showed that wound care performed over six days on two respondents with diabetic ulcers using the wound dressing method with red fruit oil ointment (Pandanus conoideus oil) accelerated the healing process, resulting in a one-score reduction in respondent 1 and a three-score reduction in respondent 2, both within the wound regeneration scale.

The researcher utilized a single respondent, Mr. M, residing in Toyareka Village, Kemangkon District, Purbalingga. The respondent diagnosed with diabetes mellitus, having a random blood glucose (RBG) level between 200–300 mg/dL, presenting with a grade 2 diabetic ulcer located on the foot, post-amputation with delayed wound healing, and no history of allergy to red fruit oil ointment. Based on the aforementioned background, the author was motivated to conduct a case study on the application of red fruit oil ointment (Pandanus conoideus oil) in the healing of diabetic ulcers. This ointment is applied as the primary dressing, serving to maintain wound moisture and thereby promote a faster healing process.

2. Research Methods

This case study employs a descriptive method. A descriptive case study is a research design that illustrates the client's condition based on factual data obtained after intensive interventions. Typically, this type of study begins with data collection through assessment, followed by data analysis according to the client's needs to determine the appropriate intensive interventions, and concludes with the implementation of actions tailored to the formulated needs derived from the factual data [10].

This method was carried out by collecting data through interviews and wound observation using the Bates-Jensen Wound Assessment Tool (BJWAT). The collected data were then analyzed to determine the appropriate interventions. Documentation was conducted both before and after the intervention.

The tools and materials used in this case study included red fruit oil ointment, wound cleansing soap, mineral water, non-sterile gloves, sterile gloves, rolled gauze, sterile gauze, a wound care set (anatomical forceps, surgical forceps, plaster scissors, and tissue scissors), and a glucometer. Wound care began with cleansing the wound using wound cleansing soap and mineral water, followed by drying and applying red fruit oil ointment. The wound was then covered with sterile gauze and rolled gauze, and finally secured with plaster. Wound care was performed every two days over a period of two weeks.

The researcher utilized a single respondent, Mr. M, residing in Toyareka Village, Kemangkon District, Purbalingga. The inclusion criteria were as follows: a client diagnosed with diabetes mellitus, having a random blood glucose (RBG) level between 200–300 mg/dL, male gender, presenting with a grade 2 diabetic ulcer located on the foot, post-amputation with delayed wound healing, willingness to participate as a respondent, and no history of allergy to red fruit oil ointment.

3. Result

Description of the Case Study Location

This study was conducted in Toyareka Village, Kemangkon Subdistrict, Purbalingga Regency, Central Java Province, Indonesia. Toyareka Village is one of the areas under the jurisdiction of Kemangkon Public Health Center. The majority of the population works as farmers, laborers, and traders. Health facilities in the village include an auxiliary health center, several integrated health posts, and mobile healthcare services provided by health personnel from Kemangkon Public Health Center. This location was selected because it is where a patient with a grade 2 diabetic ulcer was identified as the study respondent. In addition, the site offers relatively easy access, facilitating observation and intervention during the research process.

The case study was implemented through wound care over 14 days with seven treatment sessions. Wound assessment results were obtained following the application of red fruit oil ointment,

administered every two days during each wound care session. Monitoring was conducted using the Bates-Jensen Wound Assessment Tool (BJWAT) as the case study instrument. The following presents the wound condition before treatment and after two weeks of red fruit oil ointment application. The following table presents the wound conditions before and after wound care:

Table 1. Wound Before and After Treatment

Wound Before Treatment	Wound After Treatment
	
Figure 4. 1 *Wound before treatment* Source : Personal collection, (2025)	Figure 4. 2 *Wound after treatment* Source : Personal collection, (2025)
At the first session, prior to the application of red fruit oil ointment, the wound assessment showed a post-amputation diabetic ulcer measuring 8 cm × 7 cm, with a wound depth categorized as stage 5. The wound edges scored 3, indicating clearly unattached edges from the wound base. The exudate type was purulent, the surrounding skin appeared blackish, granulation tissue scored 4 (pink and/or pale, with less than 25% of the wound filled with granulation tissue), and epithelialization scored 5, indicating less than 25% epithelialization.	At the seventh session, following the application of red fruit oil ointment every two days over two weeks, the wound assessment revealed a post-amputation diabetic ulcer measuring 6 cm × 6 cm, with wound depth remaining at stage 5. The wound edges scored 2, indicating they appeared attached to the wound base. The exudate type was serous, the surrounding skin appeared bright red when pressed, granulation tissue scored 2 (bright red, with 75–100% of the wound filled with granulation tissue), and epithelialization scored 2, indicating 75–100% epithelialization

Mr. M wound demonstrated significant improvement toward healing following wound care with red fruit oil ointment, as evidenced by the notable changes from the first to the seventh session.

4. Discussion

The author employed a single respondent in this case study, with wound care administered using red fruit oil ointment for a duration of two weeks across seven sessions. The following section presents the wound care observations conducted over the two-week period, utilizing red fruit oil ointment accompanied by *bates jensen wound assessment tools*:

Table 2. Wound Care Outcome Monitoring

Date	Wound care	Assesment Score	Description
2 June 2025		44	The wound emits an odor and contains necrotic tissue, measuring 8 × 7 cm with a depth classified as stage 5. The wound edges are clearly defined but not attached to the wound base, with purulent exudate present. The surrounding skin appears black or hyperpigmented, and granulation tissue is visible; however, epithelialization has not yet occurred. The blood glucose level (GDS) was measured at 201 mg/dL.

4 June 2025		39	The wound condition has improved, with 75–100% granulation tissue covering the wound, serous exudate, and necrotic tissue that is easily removed. The blood glucose level (GDS) was recorded at 157 mg/dL.
6 June 2025		37	The wound condition improved, indicated by a reduction in size to 7.7 × 6.8 cm, with 75–100% granulation and the onset of epithelialization. The blood glucose level (GDS) was recorded at 101 mg/dL.
8 June 2025		34	The wound size decreased to 7.3 × 6.5 cm, and the wound edges began to integrate with the wound base. The blood glucose level (GDS) was recorded at 122 mg/dL.
10 June 2025		32	The wound condition improved, with a reduction in size to 6.8 × 6.3 cm. The skin around the wound began to appear reddish, and no peripheral tissue induration was observed. The blood glucose level (GDS) was recorded at 127 mg/dL.
12 June 2025		29	The wound condition showed a change in size to 6.4 × 6.1 cm, with no exudate present. The surrounding skin appeared pale white, and epithelialization occurred at 75–100%. The blood glucose level (GDS) was recorded at 82 mg/dL.
14 June 2025		28	The wound condition improved with a reduction in size to 6 × 6 cm. The blood glucose level (GDS) was recorded at 94 mg/dL.

Source : Personal collection, (2025)

From the table above, following wound care using red fruit oil ointment on Mr. M, progressive changes in wound condition were observed from the first day prior to treatment to subsequent sessions.

First session in 2 June 2025, the wound measured 8 × 7 cm (score 4) with a depth categorized as stage 5. The wound edges scored 3, indicating they were clearly unattached to the wound base, with no tunneling, and the presence of yellowish necrotic tissue that was easily removed. Exudate type scored 5 (purulent). The surrounding skin appeared blackish (score 5). No edema was present, while tissue induration < 2 cm around the wound scored 2. Granulation tissue scored 4 (pale pink, < 25% of the wound filled with granulation), and epithelialization scored 5 (< 25%). Random blood glucose (RBG) level was 201 mg/dL.

Second session in 4 June 2025, wound size remained at 8 × 7 cm (score 4) with depth categorized as stage 5. Wound edges scored 3, remaining unattached, with no tunneling, and yellowish necrotic tissue still present. Exudate type scored 4 (serous, minimal amount). Surrounding skin was blackish (score 5). No edema was present, with tissue induration < 2 cm (score 2). Granulation tissue scored 2 (bright red, 75–100% granulation), and epithelialization scored 5 (< 25%). RBG level was 157 mg/dL.

Third session in 6 June 2025, wound size had reduced to 7,7 × 6,8 cm (score 4) with depth remaining at stage 5. Wound edges scored 3, unattached, with no tunneling, and yellowish necrotic tissue easily removable (score 3). Exudate type scored 3 (serous, minimal amount). Surrounding skin appeared dark red (score 4). No edema was present, with tissue induration < 2 cm (score 2). Granulation tissue scored 2 (bright red, 75–100% granulation), and epithelialization scored 4 (25–50% epithelialization). RBG level was 101 mg/dL.

Fourth session in 8 June 2025, the wound measured 7.3 × 6.5 cm (score 4) with a depth classified as stage 5. Wound edges scored 2, indicating attachment to the wound base, with no tunneling. Yellowish necrotic tissue, easily removable, was present (score 3). Exudate type scored 4 (serous, minimal amount). Surrounding skin appeared dark red (score 4). No edema was present, and no tissue induration was observed (score 1). Granulation tissue scored 2 (bright red, 75–100% granulation), while epithelialization scored 4 (25–50%). RBG level was 122 mg/dL.

Fifth session 10 June 2025, wound size reduced to 6.8 × 6.3 cm (score 4) with depth remaining at stage 5. Wound edges scored 2, attached to the wound base, no tunneling, and necrotic tissue present (score 3). Exudate type scored 4 (serous, minimal amount). Surrounding skin was dark red (score 4). No edema and no induration observed (score 1). Granulation tissue scored 2 (bright red, 75–100%), epithelialization scored 3 (50–75%). RBG level was 127 mg/dL.

Sixth session 12 June 2025, wound size measured 6.4 × 6.1 cm (score 4) with depth at stage 5. Wound edges scored 2, attached to the wound base, no tunneling, no necrotic tissue (score 1). Exudate type: serous. Surrounding skin appeared pale white (score 3). No edema and no induration (score 1). Granulation tissue scored 2 (bright red, 75–100%), epithelialization scored 3 (75–100%). RBG level was 82 mg/dL.

Seventh session 14 June 2025, wound size reduced to 6 × 6 cm (score 3) with depth at stage 5. Wound edges scored 2, attached to the wound base, no tunneling, no necrotic tissue (score 1). Exudate type: serous. Surrounding skin appeared bright red when pressed (score 2). No edema and no induration (score 1). Granulation tissue scored 2 (bright red, 75–100%), epithelialization scored 3 (75–100%). RBG level was 94 mg/dL.

This case study was conducted by applying red fruit oil (Pandanus conoideus) ointment over a period of 14 days with a frequency of once every two days. Observational results indicated an increase in tissue granulation, a reduction in wound size, decreased exudate volume, and improved tissue integrity. These findings indicate that the wound healing process progressed optimally, in accordance with the physiological stages of wound healing: inflammation, proliferation, and remodeling [11]

The significant changes observed in Mr. M wound after 14 days of treatment with red fruit oil (Pandanus conoideus) ointment demonstrate that the components contained in the ointment can accelerate the wound healing process, as previously stated [12], The phytochemical compounds present in red fruit oil, including flavonoids, terpenoids, steroids, and alkaloids, play a significant role in the wound healing process. Proper blood glucose control also influences the healing of diabetic ulcers. Elevated blood glucose levels can lead to leukocyte abnormalities, which in turn prolong the healing process in the event of microbial infection [13].

In addition, the selection of appropriate dressings and topical agents can also influence wound healing. The principle of moist wound healing in wound care supports the effectiveness of red fruit oil ointment. A moist wound environment helps maintain enzymatic balance and stimulates epithelial cell migration, ultimately accelerating the wound healing process [14].

The study conducted by [8], indicating that the treatment of diabetic ulcers using wound dressing with red fruit oil (Pandanus conoideus oil) ointment can accelerate healing, as evidenced by a score reduction of 1 in respondent 1 and 3 in respondent 2. These findings are consistent with research by [9], which showed that wound care using modern dressing methods with red fruit oil ointment was

effective in promoting the wound healing process, as demonstrated by a reduction in wound size from 3 × 3 cm to 3 × 2 cm. Another study by [15], also provides evidence that the use of red fruit oil ointment is effective in the healing process of diabetic ulcers because it can accelerate granulation and epithelialization.

Based on the overall data, it can be concluded that the treatment of diabetic ulcers using red fruit oil ointment for 14 days with seven treatment sessions produced significant results in the wound healing process, as indicated by a decrease in wound score from 44 to 28. Thus, the reduction in wound care progression score in Mr. M indicates that red fruit oil ointment is effective in the wound healing process.

5. Conclusion

Based on the results of the 14-day case study conducted on Mr. M, who presented with a grade 2 diabetic ulcer, the use of red fruit oil ointment (Pandanus conoideus oil) was shown to enhance the healing process. This was evidenced by a reduction in wound score from 44 to 28, supported by blood glucose data on June 14, 2025, which recorded 94 mg/dL. Furthermore, improvements were observed in granulation tissue formation, reduction in wound size, and increased tissue integrity.

Research Limitations

During the implementation of this case study, a limitation was identified, namely the absence of wound culture prior to wound care.

Daftar Pustaka

[1] Lestari, Zulkarnain, Sijid, and S. Aisyah, "Diabetes Melitus: Review Etiologi, Patofisiologi, Gejala, Penyebab, Cara Pemeriksaan, Cara Pengobatan dan Cara Pencegahan," *UIN Alauddin Makassar*, vol. 1, no. 2, pp. 237–241, 2021, [Online]. Available: http://journal.uin-alauddin.ac.id/index.php/psb

[2] Y. Novitasari and E. D. Nooratri, "Penerapan Pencucian Luka Menggunakan Air Rebusan Daun Jambu Biji pada Malodor Luka Diabetes Mellitus di Wilayah Sragen," *J. Anestesi J. Ilmu Kesehat. dan Kedokt.*, vol. 2, no. 4, 2024, doi: https://doi.org/10.59680/anestesi.v2i4.1384.

[3] M. K. Selano, V. R. Marwaningsih, and N. Setyaningrum, "Pemeriksaan Gula Darah Sewaktu (GDS) dan Tekanan Darah kepada Masyarakat," *Indones. J. Community Serv.*, vol. 2, no. 1, p. 38, 2020, doi: 10.30659/ijocs.2.1.38-45.

[4] IDF, "Atlas Diabetes IDF Edisi 10." Accessed: Jan. 10, 2025. [Online]. Available: https://diabetesatlas.org/atlas/tenth-edition/

[5] Trisnawati, A. B. Rima, and R. Nurvinanda, "Faktor-Faktor Yang Berhubungan Dengan Terjadinya Ulkus Diabetikum Pada Penderita Diabetes Melitus," *Indones. J. Nurs. Heal. Sci.*, vol. 4, no. 2, pp. 85–94, 2023, doi: http://jurnal.globalhealthsciencegroup.com/index.php/IJNHS FAKTOR-FAKTOR.

[6] A. Dimantika, S. Sugiyarto, and Y. Setyorini, "Perawatan Luka Diabetes Mellitus Menggunakan Teknik Modern Dressing," *Interes. J. Ilmu Kesehat.*, vol. 9, no. 2, pp. 160–172, 2020, doi: 10.37341/interest.v9i2.210.

[7] Y. Yasir, H. Rante, and R. Wijayati, "Isolasi Fungi Endofit Dari Kulit Buah Merah (Pandanus Conoideus Lamk .) Asal Kabupaten Jayapura Sebagai Penghasil Senyawa Antibakteri (Isolation Of Endophytuc Fungi From Red Fruit (Pandanus Conoidetus Lamk) From Jayapura Regency As A Producer Of Antib," vol. 1, 2024.

[8] N. Sahid and S. Hartutik, "Penerapan Metode Modern Wound Dressing Terhadap Penyembuhan Luka Diabetes Mellitus Di Woundcare Wonogiri," *J. Inov. Kesehat. Adapt.*, vol. 6, no. Dm, pp. 90–99, 2024.

[9] S. N. Dzaki, E. Julianto, and F. D. Puspasari, "Perawatan Luka Diabetes Melitus Dengan Metode Modern Dressing," *J. Ilm. Multidisipline*, vol. 1, no. 6, pp. 1000–1008, 2023, [Online]. Available: https://doi.org/10.5281/zenodo.8174493

[10] B. Lapau. *"Metode Penelitian Kesehatan: Metode Penelitian Ilmiah Skripsi, Tesis, dan Disertasi,"* Jakarta: Yayasan Pustaka Obor. 2015.

[11] M. Aminuddin, M. Sukmana, D. Nopriyanto, and S. Sholichin. *Modul Perawatan luka.* Kalimantan Timur: Faculty of Medicine Book's, LP3M Universitas Mulawarman. 2020.

[12] Khairani, "Hari Diabetes Sedunia," *Pusat Data dan Informasi Kementrian Kesehatan RI*, vol. 99444851, no. 031, pp. 1–8, 2019.

[13] S. Munirah, S. Damayanti, and N. Hidayat. "Hubungan kadar gula darah dengan penyembuhan luka pada pasien ulkus diabetikum di poliklinik bedah rsud sleman," *Jurnal Kesehatan Masyarakat*, vol. 17, no. September, pp. 94–102, 2024.

[14] J. E. Br.Purba, K. D. P. Sari;, and L. Nazara. "Gambaran Pengetahuan Dan Sikap Perawat Tentang Perawatan Luka Terkini Di Klinik Permata Saribudolok," *J. Keperawatan Arta*, vol. 1, no. 1, pp. 15–23, 2021.

[15] G. R. Arliagustiani, E. Julianto, and F. D. Puspasari. "Asuhan Keperawatan Pada Pasien Ulkus Diabetik Dengan Modern Dressing : Salep Minyak Buah Merah Di Desa Toyareja Nursing Care For Diabetic Ulcer Patients With Modern Dressing : Red Fruit Oil Ointment In Toyareja Village," *Multidisciplinary Indonesian Center Journal (MICJO)*, Vol. 2, no. 1. pp. 853–860, 2025.