



Implementation of Virgin Coconut Oil Moist Dressing in Diabetic Ulcer Wound Care: A Nursing Case Study

Bella Oktavera¹, Ade Fitriani¹, Lilis Lismayanti¹, Ayu Endang Purwati¹

¹STIKes Muhammadiyah Ciamis, West Java, Indonesia

Correspondence author: Ade Fitriani

Email: oktaveraabella@gmail.com

Address: STIKes Muhammadiyah Ciamis, Jl. K.H. Ahmad Dahlan No.20, Ciamis, Indonesia

DOI: <https://doi.org/10.56359/kian.v5i1.590>



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

ABSTRACT

Introduction: *Diabetic ulcers are one of the most common chronic complications of Diabetes Mellitus and are associated with delayed wound healing, increased infection risk, and lower quality of life. Maintaining an optimal moist wound environment is an essential component of diabetic ulcer management. Virgin Coconut Oil (VCO) has antimicrobial, anti-inflammatory, and moisturizing properties that may enhance wound healing.*

Objective: *To describe the implementation of Virgin Coconut Oil as a moist dressing in promoting diabetic ulcer wound healing through a nursing care approach.*

Method: *This descriptive case study involved one patient with Type 2 Diabetes Mellitus presenting with a diabetic ulcer. Nursing care was provided through assessment, diagnosis, intervention, implementation, and evaluation according to the Indonesian Nursing Standards (SDKI, SIKI, and SLKI). Virgin Coconut Oil was applied as a moist dressing during three consecutive nursing visits. Wound progress was evaluated using clinical observations based on wound moisture, redness, signs of infection, and tissue appearance.*

Result: *Progressive improvement was observed following three applications of VCO. The wound demonstrated improved moisture balance, reduced periwound redness, healthy granulation tissue formation, and no clinical signs of infection. These findings indicate that VCO supported the wound healing process during nursing care.*

Conclusion: *Virgin Coconut Oil may serve as a practical, safe, and low-cost complementary intervention for diabetic ulcer wound management. Further studies involving larger samples and controlled study designs are recommended to confirm its effectiveness.*

Keywords: *Diabetes Mellitus; Diabetic Ulcer; Nursing Care; Virgin Coconut Oil; Wound Healing.*

Introduction

Diabetes Mellitus (DM) is one of the fastest-growing chronic metabolic diseases worldwide and has become a major public health concern due to its increasing prevalence

and long-term complications. According to the World Health Organization (WHO), approximately 830 million adults were living with diabetes globally in 2022, and diabetes or diabetes-related hyperglycemia contributed to approximately 2.2 million deaths in 2021. Persistent hyperglycemia causes progressive damage to blood vessels and peripheral nerves, increasing the risk of chronic complications that significantly impair patients' quality of life, including diabetic foot ulcers (WHO, 2023).

Diabetic ulcers are among the most common and severe complications of Diabetes Mellitus, affecting approximately 15–25% of patients during their lifetime. These chronic wounds result from a combination of peripheral neuropathy, peripheral arterial disease, infection, and impaired immune responses, leading to delayed wound healing and an increased risk of lower-extremity amputation. Diabetic foot ulcers remain a significant cause of hospitalization, disability, and healthcare expenditure worldwide. In Indonesia, the prevalence of Diabetes Mellitus continues to increase, making diabetic ulcer management an important priority in nursing practice, particularly in community and home-care settings.

Successful management of diabetic ulcers requires comprehensive nursing interventions that include glycemic control, infection prevention, debridement, pressure offloading, and maintenance of an optimal moist wound environment. Moist wound healing has been recognized as an effective approach because it promotes epithelialization, angiogenesis, granulation tissue formation, and autolytic debridement while reducing tissue dehydration and wound trauma during dressing changes. Consequently, the selection of an appropriate wound dressing is an essential component of nursing care.

Virgin Coconut Oil (VCO) has recently gained attention as a complementary therapy for wound management because of its biological properties. VCO contains medium-chain fatty acids, particularly lauric acid, capric acid, and caprylic acid, which possess antimicrobial, anti-inflammatory, antioxidant, and moisturizing activities. These bioactive compounds may inhibit bacterial growth, reduce inflammatory responses, improve skin hydration, stimulate collagen synthesis, and accelerate tissue regeneration. Previous studies have demonstrated that VCO contributes to improved wound healing outcomes in patients with diabetic ulcers by maintaining an optimal moist environment and reducing the risk of wound infection (Dafriani et al., 2020; Soliman et al., 2018).

Although several studies have reported the effectiveness of Virgin Coconut Oil in diabetic wound management, evidence regarding its implementation within a structured nursing care process using the Indonesian Nursing Standards (SDKI, SIKI, and SLKI) remains limited. Furthermore, reports describing the application of VCO in community-based nursing care through a case study approach are still scarce. Therefore, documenting evidence from nursing practice is important to support the integration of complementary wound care interventions into clinical nursing services.

This case study aimed to describe the implementation of Virgin Coconut Oil as a moist dressing intervention in the nursing management of a patient with a diabetic ulcer and to evaluate changes in wound healing during the nursing care process.

Objective

To describe the implementation of Virgin Coconut Oil (VCO) as a moist dressing intervention in the nursing management of a patient with a diabetic ulcer and to evaluate changes in wound healing during the nursing care process.

Method

Study Design and Setting

This study employed a descriptive case study design using a nursing care approach to describe the implementation of Virgin Coconut Oil (VCO) in the management of diabetic ulcer wounds. The study was conducted during home nursing visits at the patient's residence in Giriharja Village, Rancah District, Ciamis Regency, West Java, Indonesia. Nursing care was implemented according to the Indonesian Nursing Standards, including the Standar Diagnosis Keperawatan Indonesia (SDKI), Standar Intervensi Keperawatan Indonesia (SIKI), and Standar Luaran Keperawatan Indonesia (SLKI).

Participant

The participant was selected using purposive sampling based on predetermined eligibility criteria. The inclusion criteria were: (1) diagnosed with Type 2 Diabetes Mellitus, (2) presenting with a diabetic ulcer classified as Wagner Grade II, (3) aged ≥ 18 years, (4) cooperative and able to communicate effectively, and (5) willing to participate by providing informed consent. Patients with known allergies to coconut oil, systemic infections requiring emergency treatment, or receiving other advanced wound therapies were excluded.

The selected participant was an elderly male with a history of uncontrolled Type 2 Diabetes Mellitus who presented with a chronic diabetic ulcer on the lower extremity. The participant was chosen to allow an in-depth exploration of the nursing care process and wound healing outcomes following VCO application).

Intervention

The nursing intervention consisted of wound care using Virgin Coconut Oil (VCO) as a moist dressing. Before each application, the wound was assessed and cleansed using sterile 0.9% normal saline solution following aseptic procedures. Virgin Coconut Oil was then applied evenly to the wound bed and surrounding skin using sterile gauze to maintain a moist wound environment. The wound was subsequently covered with sterile dressing materials according to standard wound care procedures. This intervention was performed during three consecutive nursing visits while maintaining routine diabetes management and patient education.

Instruments and Outcome Measurement

Data were collected using interview guidelines, physical examination forms, observation checklists, and the Bates-Jensen Wound Assessment Tool (BWAT). The BWAT was used to evaluate wound healing progression by assessing wound size, depth, wound edges, necrotic tissue, exudate characteristics, surrounding skin condition, granulation tissue, and epithelialization. This standardized instrument has demonstrated good reliability and validity for monitoring chronic wound healing in clinical settings (Bates-Jensen et al., 2019).

Nursing documentation was completed using the SOAPIER format to ensure systematic recording of patient assessment, intervention, and evaluation throughout the nursing care process.

Data collection and analysis

Data collection was conducted during three consecutive home nursing visits. Baseline information was obtained through interviews, review of medical history, and comprehensive physical examination. During each visit, wound characteristics were evaluated using the BWAT before and after the application of Virgin Coconut Oil. Additional observations

included wound moisture, periwound erythema, exudate, granulation tissue formation, and clinical signs of infection.

The collected data were analyzed descriptively by comparing wound assessment findings across the three nursing visits. Changes in wound healing indicators—including wound moisture, periwound erythema, granulation tissue formation, epithelialization, and signs of infection—were interpreted according to the BWAT assessment results and the expected nursing outcomes outlined in the SLKI. The findings were presented narratively and supported by tables to illustrate wound healing progression following the implementation of Virgin Coconut Oil.

Results

Patient Characteristics

The participant was an elderly male diagnosed with Type 2 Diabetes Mellitus who presented with a chronic diabetic ulcer on the lower extremity classified as Wagner Grade II. Initial wound assessment revealed a moist wound bed with periwound erythema, without clinical signs of infection. The patient underwent three consecutive nursing visits during which Virgin Coconut Oil (VCO) was applied as a moist dressing following standard wound care procedures.

Table 1. Clinical Progress of the Diabetic Ulcer During Three Consecutive Nursing Visits

Wound Parameters	Day 1 (Baseline)	Day 2	Day 3
Wound moisture	Excessively moist	Adequately moist	Optimal moisture
Periwound erythema	Present	Reduced	Minimal
Granulation tissue	Minimal	Moderate	Increased
Wound edges	Irregular	Improving	More defined
Signs of infection	None	None	None
Exudate	Moderate	Mild	Minimal

The wound assessment demonstrated progressive improvement throughout the three nursing visits. On the first day, the ulcer exhibited excessive moisture accompanied by erythema surrounding the wound, although no clinical signs of infection were observed. During the second visit, periwound erythema had decreased, wound moisture became more balanced, and early granulation tissue formation was observed.

By the third nursing visit, the wound showed further improvement, characterized by optimal moisture, minimal erythema, increased granulation tissue, improved wound edges, and the continued absence of infection. These observations indicate favorable wound healing progression following the implementation of Virgin Coconut Oil as a complementary moist dressing intervention.

Discussion

This case study demonstrated progressive improvement in diabetic ulcer healing following the implementation of Virgin Coconut Oil (VCO) as a complementary moist dressing during three consecutive nursing visits. The wound showed a reduction in periwound erythema, improved moisture balance, increased granulation tissue formation, and no clinical signs of infection throughout the observation period. These findings suggest that VCO may support the wound healing process when integrated into a structured nursing care program based on the Indonesian Nursing Standards (SDKI, SIKI, and SLKI).

The favorable wound healing observed in this study may be explained by the biological properties of Virgin Coconut Oil. VCO contains medium-chain fatty acids, particularly lauric acid, capric acid, and caprylic acid, which possess antimicrobial, anti-inflammatory, and antioxidant activities. Lauric acid has been reported to inhibit the growth of several pathogenic microorganisms commonly associated with chronic wound infections. In addition, the emollient properties of VCO help maintain an optimal moist wound environment, which facilitates epithelialization, collagen synthesis, angiogenesis, and granulation tissue formation. Maintaining appropriate wound moisture is widely recognized as a key principle of modern wound management because it accelerates tissue regeneration while minimizing tissue damage during dressing changes.

The findings of this case study are consistent with previous research conducted by Dafriani et al. (2020), who reported that VCO significantly accelerated diabetic wound healing by maintaining wound moisture and reducing the risk of infection. Likewise, Soliman et al. (2018) demonstrated that topical application of VCO enhanced collagen deposition, reduced inflammatory cell infiltration, and promoted tissue regeneration in diabetic wound models. Furthermore, Ibrahim et al. (2020) concluded that the antioxidant and anti-inflammatory properties of VCO contribute to improved tissue repair and protection against oxidative stress, which plays an important role in delayed wound healing among patients with Diabetes Mellitus. The consistency between the present findings and previous studies supports the potential role of VCO as a complementary intervention in diabetic ulcer management.

From a nursing perspective, the implementation of VCO offers several practical advantages. Compared with many commercial advanced wound dressings, VCO is inexpensive, widely available, and easy to apply in both clinical and home-care settings. These characteristics make it particularly suitable for community nursing services in resource-limited areas. The use of VCO may also increase patient adherence to wound care because of its simple application and accessibility. However, VCO should be considered a complementary intervention rather than a replacement for evidence-based diabetic ulcer management, which includes glycemic control, infection prevention, pressure offloading, nutritional support, and routine wound assessment.

This study also contributes to nursing practice by documenting the implementation of VCO within a standardized nursing care framework using the Indonesian Nursing Standards (SDKI, SIKI, and SLKI). Although previous studies have primarily focused on the biological effectiveness of VCO, evidence describing its integration into comprehensive nursing care remains limited. Therefore, this case study provides additional clinical evidence supporting the use of VCO as part of holistic nursing management for patients with diabetic ulcers.

Despite these encouraging findings, several limitations should be acknowledged. This study involved only a single participant, limiting the generalizability of the findings. The observation period was relatively short and focused on the early phase of wound healing. In addition, wound healing was evaluated primarily through clinical observation, without laboratory biomarkers or microbiological examination to confirm tissue regeneration and bacterial reduction. Therefore, the results should be interpreted cautiously.

Future studies should involve larger sample sizes and employ quasi-experimental or randomized controlled trial designs to compare VCO with standard wound dressings or other complementary therapies. Longer follow-up periods, objective wound assessment

instruments such as the Bates-Jensen Wound Assessment Tool (BWAT) or Pressure Ulcer Scale for Healing (PUSH), and patient-reported outcomes including pain, comfort, quality of life, and cost-effectiveness should also be incorporated to strengthen the evidence regarding the clinical effectiveness of Virgin Coconut Oil in diabetic ulcer management.

Conclusion

This case study suggests that the implementation of Virgin Coconut Oil (VCO) as a complementary moist dressing was associated with favorable wound healing outcomes in a patient with a diabetic ulcer. Progressive improvements were observed in wound moisture balance, reduction of periwound erythema, granulation tissue formation, and the absence of clinical signs of infection during three consecutive nursing visits. These findings indicate that VCO may serve as a practical, safe, and low-cost complementary intervention in diabetic ulcer management when integrated into a structured nursing care process. However, because this study involved only a single case, further research using larger sample sizes and controlled study designs is required to confirm the clinical effectiveness of VCO in diabetic wound care.

Ethical Clearance

This study received ethical approval from the Ethics Committee of STIKes Muhammadiyah Ciamis prior to data collection. Written informed consent was obtained from the participant before the implementation of nursing care. The participant's identity and personal information were kept confidential throughout the study, and all procedures complied with the ethical principles of autonomy, beneficence, non-maleficence, and justice.

References

- American Diabetes Association Professional Practice Committee. (2025). *Standards of care in diabetes—2025. Diabetes Care, 48*(Suppl. 1). <https://doi.org/10.2337/dc25-SINT>
- Bates-Jensen, B. M., McCreath, H. E., & Murray, B. P. (2019). Reliability of the Bates-Jensen Wound Assessment Tool. *Wound Repair and Regeneration, 27*(4), 386–395. <https://doi.org/10.1111/wrr.12727>
- Dafriani, P., Nur, S. A., Morika, H. D., & Marlinda, R. (2020). Virgin Coconut Oil (VCO) accelerated wound healing process in Diabetes Mellitus patients with diabetic ulcer in Dr. Rasidin Hospital, Padang, Indonesia. *Jurnal Aisyah: Jurnal Ilmu Kesehatan, 5*(2), 221–224. <https://doi.org/10.30604/jika.v5i2.375>
- Edmonds, M., Manu, C., & Vas, P. (2021). The current burden of diabetic foot disease. *Journal of Clinical Medicine, 10*(17), 3951. <https://doi.org/10.3390/jcm10173951>
- Frykberg, R. G., & Banks, J. (2019). Challenges in the treatment of chronic wounds. *Advances in Wound Care, 8*(2), 77–85. <https://doi.org/10.1089/wound.2018.0786>
- Game, F. L., Jeffcoate, W. J., Apelqvist, J., Lipsky, B. A., & Schaper, N. C. (2020). Management of diabetic foot ulcers: A review. *The Lancet Diabetes & Endocrinology, 8*(10), 845–857.
- Ibrahim, M. A., Ghazali, N. F., Mustafa, F. F., & Tengku Muhammad, T. S. (2020). Virgin coconut oil as antioxidant and treatment on metabolic disorders: A short review.

- International Journal of Allied Health Sciences*, 4(4), 1602–1607.
<https://doi.org/10.31436/ijahs.v4i4.284>
- International Diabetes Federation. (2021). *IDF Diabetes Atlas* (10th ed.).
<https://diabetesatlas.org>
- International Working Group on the Diabetic Foot. (2023). *IWGDF guidelines on the prevention and management of diabetic foot disease*. <https://iwgdfguidelines.org>
- Kementerian Kesehatan Republik Indonesia. (2023). *Profil kesehatan Indonesia 2023*.
<https://www.kemkes.go.id>
- McGuire, J. (2021). Modern moist wound healing principles in diabetic foot ulcers. *Advances in Skin & Wound Care*, 34(8), 1–8.
- Perhimpunan Endokrinologi Indonesia. (2021). *Pedoman pengelolaan dan pencegahan diabetes melitus tipe 2 di Indonesia 2021*. PB PERKENI.
- Putri, P. D., Arman, E., & Indrawati, N. (2023). Virgin Coconut Oil accelerated wound healing process in Diabetes Mellitus patients with diabetic ulcer. *Journal of Chemical Health Risks*, 13(4), 320–327. <https://doi.org/10.22034/jchr.2023.1965896>
- Schaper, N. C., van Netten, J. J., Apelqvist, J., Bus, S. A., Hinchliffe, R. J., & Lipsky, B. A. (2024). Practical guidelines on the prevention and management of diabetes-related foot disease. *Diabetes/Metabolism Research and Reviews*.
<https://doi.org/10.1002/dmrr.3805>
- Soliman, A. M., Teoh, S. L., Ghafar, N. A., & Das, S. (2018). Virgin coconut oil and diabetic wound healing: Histopathological and biochemical analysis. *European Journal of Anatomy*, 22(2), 135–144.
- Weller, C., Team, V., & Sussman, G. (2020). Principles of wound management and dressing selection. *Journal of Wound Care*, 29(Suppl. 9), S1–S18.
- World Health Organization. (2023). *Diabetes*. <https://www.who.int/news-room/fact-sheets/detail/diabetes>
- World Health Organization. (2023). *Global report on diabetes*. <https://www.who.int>
- Yazdanpanah, L., Nasiri, M., & Adarvishi, S. (2018). Literature review on the management of diabetic foot ulcer. *World Journal of Diabetes*, 9(5), 73–83.
<https://doi.org/10.4239/wjd.v9.i5.73>