

# **Application of Virgin Coconut Oil (VCO) Massage and Repositioning in Decubitus Ulcers of Patients with Multiple Complications: A Case Study**

**Hanna Alya Yasmine, Urip Rahayu, Tuti Pahria**  
Faculty of Nursing, Universitas Padjadjaran  
**Email:** hanna20008@mail.unpad.ac.id

## **Abstract**

Patients with peritoneal abscesses who are immobilized are at risk of decubitus ulcer. Various complications in patients such as malnutrition and anaemia in patients cause a decrease in body immunity, causing a high risk of decubitus ulcers and difficulty in wound healing. Massage using Virgin Coconut Oil (VCO) and repositioning are combined interventions to reduce the risk and healing of decubitus ulcers. The study aims to determine the results of massage using VCO and repositioning patients with decubitus ulcers in healing and efforts to prevent decubitus ulcer effectively. The study is a case report of the application of massage using VCO and repositioning in a patient with decubitus ulcer with intraperitoneal abscess, pneumonia, malnutrition, and anaemia at Sumedang Regional Hospital. The patient is a 33-year-old woman with grade 2 decubitus ulcers in the sacrum area which appeared red, serum, skin peeling, and shallow holes. The patient was selected for treatment due to the decubitus ulcers, high risk of decubitus ulcers, and the absence of any interventions. Massage with VCO and repositioning were performed twice daily for 6 days. The interventions were carried out consistently by researchers, nurses, patients, and their families. There were a decrease in degree 2 to degree 1 in the patient's sacrum decubitus ulcers after massage using VCO and repositioning.

**Keywords:** decubitus ulcer, immobilization, massage, repositioning, Virgin Coconut Oil (VCO)

## Introduction

Intraperitoneal abscess is a complication of intra-abdominal infection characterized by accumulation of pus in the peritoneal cavity. This abscess can be caused by abdominal trauma, infection and colitis (Hussain MA., et al., 2023). Patients with peritoneal abscess often experience severe pain, immobilization, fever, and decreased physical condition, requiring intensive care and prolonged bed rest (Nguyen et al., 2019). Prolonged immobilization is one of the main factors that cause constant pressure on certain areas of the body which triggers the formation of decubitus ulcers.

Pneumonia and decubitus ulcers are two medical conditions that often occur in patients with decreased physical mobility or prolonged bed rest. Pneumonia is an infection of the lung tissue caused by various microorganisms, such as bacteria, viruses or fungi (Vebi et al., 2023). Patients who are immobile or immunocompromised are highly susceptible to pneumonia due to exposure to pathogens and low immunity. The patient was also malnutrition and anaemia, resulting in low immunity. Malnutrition is a state in which a person lacks nutrients such as carbohydrates, proteins, fats and vitamins needed in the body. Malnutrition is also associated with decreased wound tensile strength and increased infection rates. In addition, there is anaemia which is a low level of hemoglobin in the blood that can lead to reduced tissue oxygenation capacity (World Health Organization, 2020). Patients with malnutrition and anaemia are at risk of decubitus ulcers, infection, and delayed wound healing resulting in chronic non-healing wounds (Prajayanti et al., 2024).

Decubitus ulcers are a common wound condition found in patients with long-term immobilization. This wound occurs due to pressure on the soft tissue between the body surface and external surfaces such as beds or wheelchairs, which will cause tissue ischemia to necrosis (Shahin et al., 2020). This condition is influenced by climate, nutrition, tissue perfusion, comorbidities, and the condition of the patient's soft tissues. According to the Global Burden of Disease Study 2021, the total number of decubitus

ulcer cases increased from 300,442 in 1990 to 645,588 in 2021 (Qin et al., 2024). Based on data from the Ministry of Health of the Republic of Indonesia in 2023, the incidence ratio of decubitus ulcers in Indonesia was recorded at more than 30%, this figure is higher than the prevalence in Asia which ranges from 2.1% - 18% (Ministry of Health Republic Indonesia, 2023).

The main nursing interventions to prevent decubitus ulcers, namely skin care and prevention of surface mechanics, include patient positioning (Aryani et al., 2022). There are several ingredients that are recommended as skin hydration, such as Virgin Coconut Oil (VCO), Virgin Olive Oil (VOO), Nigella Sativa Oil (NGS), and petroleum jelly. Virgin Coconut Oil (VCO), which is pure coconut oil, is easily available around the community, is affordable, has a good moisturizing content, and does not cause allergic side effects, allowing it to be the most effective ingredient applied to patients. Research conducted by Najihah, et al., (2020) explains that the application of repositioning and massage can reduce the degree of decubitus ulcers in immobilized patients (Najihah et al., 2022). Research shows effleurage massage combined with VCO can help soften the skin and reduce the risk of decubitus ulcers from immobilization (Purnawaty et al., 2024). The vitamin E, lauric, and folate acids in VCO act as skin moisturizers. Furthermore, VCO's antibacterial properties can protect the skin from infection, and its acid content can increase skin hydration, thus accelerating the healing process (Sihombing et al., 2016). In addition, repositioning the patient's body is important to improve blood circulation (Tilmazer & Tuzer, 2019). Red blood cells that function as oxygen carriers from the lungs to all parts of the body will cause skin tissue hypoxia, thereby accelerating cell damage and inhibiting the wound healing process (Romadhona et al., 2023).

The patient's peritoneal abscess, pneumonia, malnutrition, and anaemia made her highly susceptible to decubitus ulcers. In this case, the decubitus ulcer condition was not known to the patient or the patient's family. The patient also did not know the causes, treatments, and prevention that should be done at the risk of decubitus ulcers. This

condition causes no intervention for patients with high risk of decubitus ulcers (Amini, et al., 2022). The condition of patients with decubitus ulcers and various complications makes researchers interested in applying massage interventions using VCO and repositioning in patients. This study aims to determine the results of the application of massage using VCO and repositioning patients with decubitus ulcers in healing and efforts to prevent decubitus ulcers effectively and holistically

**Method**

This scientific paper uses a case report design. The case study method was used in this research because it is able to connect theory and practice in the real context of health services, comprehensive and structured documentation, flexible to patient conditions, and provides an in-depth understanding of nursing practice. Researchers provide the results of the application of massage using VCO and Reposition in patients with decubitus ulcers with intraperitoneal abscesses,

pneumonia, malnutrition, and anaemia in the internal medicine room of RSUD Kabupaten Sumedang . Data collection was obtained from the results of history taking, observation, and physical examination. The focal data in this study is the integumentary system of the patient’s decubitus ulcer. The process of data collection and intervention was carried out on November 21-29, 2024.

The patient is a 33-year-old female with Intraperitoneal Abscess. The patient had been bedridden since two months prior to admission. The patient said she was unable to perform her daily activities other than in bed. The patient had a right leg contracture due to long-term immobilization. The patient also had Community Acquires Pneumonia (CAP). During the assessment, the patient with a diagnosis of pneumonia, intraperitoneal abscess, malnutrition with 2nd degree decubitus ulcers on the sacrum was admitted to the internal medicine room. The patient was given information about the intervention plan, benefits, and how to perform massage using Virgin Coconut Oil (VCO) and repositioning for the risk and healing of decubitus ulcers.

	Massage with VCO	Repositioning
Indications	Patients with risk of decubitus ulcers, not allergic to VCO, and have no contraindications to massage (Sihombing et al., 2016).	Patients with risk of decubitus ulcers and obstructed blood flow
Contraindications	No massage on protruding bones as it interferes with tissue perfusion (Kuraesin, 2009).	Patients with fractures and neurological disorders leading to instability of vital signs
Techniques	Effleurage technique, which uses the palm of the hand with gentle circular pressure.	Supine, right side, and left side positions.
Time and duration	2 times daily in the morning and evening.	Every 2-4 hours in the morning to afternoon and every 6 hours at night.
Interveners	Researcher, nurse, and patient's family.	Researcher, nurse, patient's family, patient

**Results**

After the massage intervention using VCO and repositioning the patient showed a decrease in the degree of decubitus ulcers from degree 2 to degree 1. In addition, there were changes in the characteristics of decubitus ulcers in patients. On the first day, the wound looked red and there was serum discharge. The serum in the wound decreased on the 4th day of treatment while the redness of the wound appeared to decrease on the 5th day of treatment. The patient also noticed

a decrease in pain from 6/10 to 2/10 on the last day. On the patient’s wound, there was a decrease in skin shedding on day 3. The hole in the patient’s wound closed on the 4th day of treatment. The wound changes showed that the patient had a decrease in the degree of decubitus ulcers from grade 2 to grade 1 on the patient’s sacrum. During the treatment, no decubitus ulcers were found on other body areas.

**Tabel 2. Decubitus ulcers characteristics**

Location	Date	Decubitus Ulcers Risk (Braden/ Norton Score)	Color	Pain	Serum	Skin Peeling	Shallow Hole	Diameter	Wound Degree
Sacrum	23/11/2024	11/9	Red	6/10	+	+	+	1.20 mm 2.10 mm 3.10 mm	2
	25/11/2024	-	Red	6/10	+	+	+	1.20 mm 2.10 mm 3.10 mm	2
	26/11/2024	-	Red	5/10	+	+	+	1.20 mm 2.10 mm 3.10 mm	2
	27/11/2024	-	Red	3/10	-	+	-	1.20 mm 2.10 mm 3.10 mm	2
	28/11/2024	-	Red fading	3/10	-	-	-	1.20 mm 2.10 mm 3.10 mm	1
	29/11/2024	12/9	Red fading	2/10	-	-	-	1.20 mm 2.10 mm 3.10 mm	1

The table above shows that there are changes in decubitus ulcers from day one to day seven of treatment. The patient’s wound appeared to improve although it had not fully recovered. It can be seen in the picture that the redness of the patient’s decubitus ulcers has faded. The wound also looked smaller, closed, and there was no exudate. The patient also experienced a change in the Braden Scale from 11 to 12 but the patient’s Norton Scale did not decrease, which remained at a score of 9. The increase in the Braden Scale shows that the risk of decubitus ulcers in patients decreases.

**Discussion**

The degree of decubitus ulcers decreased from degree 2 to degree 1 after six days of massage with VCO and patient repositioning. This finding is consistent with the study by Najihah et al. (2022), that massage and patient repositioning are effective in reducing the degree of decubitus in bed rest patients.

Based on the results, the patient only changed on the Braden Scale from 11 (high risk) to 12 (moderate risk) but did not change on the Norton Scale, which remained 9 (at risk). This was due to the different indicators in the two decubitus ulcers risk assessment measurement tools. The Braden Scale is based on six common risk factors including sensory function, moisture, activity, mobility, nutrition and friction (Huang et al., 2021). The

Norton scale includes five indicators, namely physical condition, level of consciousness, activity in movement, mobility, and incontinence (Bhoki et al., 2017). The Braden Scale includes more factors than the Norton Scale, such as nutrition, sensory perception limitations, and moisture (Huang et al., 2021). The difference in indicators makes changes in nutritional status in patients not a benchmark on the Norton Scale.

**1.VCO Massage and Repositioning**

Massage helps improve blood circulation, which in turn enhances metabolic regulation, restores physiological function, and accelerates wound healing. Studies show that effleurage massage combined with VCO supports metabolism, reduces inflammation-related oedema, promotes relaxation, alleviates pain, softens the skin, and reduces injury risk due to immobility (Purnawaty et al., 2024). VCO contains vitamins A, D, E, and K, provitamin A, and Medium Chain Fatty Acids (MCFAs) such as lauric acid, which are easily absorbed by mitochondria and promote the formation of new cells while replacing damaged ones. It also acts as a moisturizer that reduces skin friction (Dewandono, 2014).

Patient positioning is crucial to reducing decubitus ulcer risk . Repositioning is an intervention aimed at preventing and minimizing decubitus ulcers in patients

with mobility issues. Alternating between left and right side-lying positions reduces prolonged pressure on specific body parts, thus improving blood circulation in those areas (Simanjuntak & Purnama, 2020). With the repositioning of the right and left tilt, the condition of the body parts that experience pressure will have a smooth supply of oxygen-rich blood flow and nutrients so that it will reduce the risk of decubitus ulcers (Moore & Cowman, 2015). By regularly repositioning the patient every 2–4 hours, the skin at risk is exposed to air, helping maintain proper moisture, temperature, and circulation. Repositioning every 2-4 hours also exposes the skin at risk of pressure sores to air so that moisture, temperature, and skin circulation are in good condition. A decrease in decubitus ulcers also occurs after back massage due to the smooth flow of blood/lymph from the heart to peripheral organs. The existence of these conditions makes pain decrease due to a decrease in lactic acid buildup in the patient's body (Sholihah et al., 2023).

Wound healing is affected by a number of factors, for example, infection, poor blood supply or systemic disease (Moore & Cowman, 2015). Wound healing of decubitus ulcers is the body's normal response to injury or other disruption of skin integrity. Skin wound healing involves a complex interaction of keratinocytes, fibroblasts, endothelial cells, nerves and immunity. The goals of the wound healing process include replacing damaged tissue and restoring skin continuity. Open wounds such as decubitus ulcers heal through granulation tissue formation and tissue epithelialization.

## **2. Nutrition**

Decubitus ulcers is caused by several things, one of which is patient nutrition (Beatrich & Pujiastuti, 2024). Research conducted by Hidayat & Aprina (2024) shows that patients who have good nutrition tend to experience a rapid wound healing process due to adequate protein which functions as collagen secretion to provide skin strength and encourage wound edges to close (Hidayat & Aprina, 2024). The lack of nutrition in patients has a significant impact on the length of the wound healing process. Adequate nutrition will support the

tissue healing process, accelerate wound healing, and fight infection (Prajayanti et al., 2024). The patient also had hypocalcemia, which contributed to delayed healing. Calcium enhances platelet activity for hemostasis and supports epithelialization and tissue would create an epitalization process for good tissue regeneration (Suprapti et al., 2024). Calcium has a calcium-sensing receptor (CaSr) that functions to encourage the formation of the E-cadherin/catenin (Cdh1/Ctnn) complex which plays a crucial role in the inflammatory phase and immune response, proliferation (or fibroplasia), migration, cell differentiation in fibroblasts and keratinocytes, facilitates the formation of antipermeability, maintains body fluids, protects against infection, and increases the body's immunity so that it will accelerate the wound healing process (Bikle, 2023).

The condition of anaemia in patients inhibits the wound healing process. The lower the Hemoglobin (Hb) level, the longer the wound healing process will occur (Alimansur & Santoso, 2019). This occurs because of a decrease in arterial oxygenation, causing hemodialysis (blood dilution) which will interfere with tissue repair in people suffering from anaemia (Dewi et al., 2023). The lack of Hb as a metalloprotein (protein that has iron) in red blood cells that acts as a carrier of oxygen from the lungs to the rest of the body will inhibit the wound healing process (Romadhona et al., 2023).

## **3. Education**

Patient compliance in massage and repositioning is important in the healing process of decubitus ulcers. Providing education is also an important aspect for the success and sustainability of the intervention. In providing education, nurses become educators who motivate clients to behave well in health support. One of the objectives of the education provided, namely so that patients and families of patients can make the right decisions and behaviors in improving health (Iqonul, 2015). The involvement of family support also affects the patient's recovery. The higher the family support for patients, the faster the wound healing process in patients (Utami et al., 2024).

The limitations of this study, namely the duration of research on the results of the intervention which was only carried out for 1 week so that monitoring of the intervention was continued independently by the patient and the patient's family. The healing process of second degree decubitus ulcers takes about 1-3 weeks (Palese et al., 2015). Therefore, patients still have the opportunity to heal wounds adequately independently so that patient compliance and family support are needed appropriately for the therapy provided. The implications of this interventions are a reduction in pressure ulcers, safe and easy nonpharmacological interventions, strengthening the role of nurses in the quality of patient care, and practice based learning.

### Conclusion

Based on the evaluation results of the application of massage interventions using VCO and repositioning, there was a decrease in the degree of decubitus ulcers from degree 2 to degree 1 in patients. Both interventions can also reduce the risk of ulcers on other pressure point areas. Barriers that affect decubitus ulcers healing in patients are malnutrition and anaemia. These conditions cause a decrease in arterial oxygenation to the whole body, a decrease in muscle mass, a decrease in skin elasticity, and a weakening of the body's immune system so that decubitus ulcer healing is hampered. The application of massage using Virgin Coconut Oil (VCO) and patient repositioning is recommended in patients with decubitus ulcers or high risk of decubitus. In addition, education is needed regarding compliance and family support in the application of massage and repositioning given as an independent follow-up intervention for patients. Future researchers are expected to be able to develop further interventions or other factors related to decubitus ulcers.

### References

Alimansur, M., & Santoso, P. (2019). Faktor Resiko Dekubitus Pada Pasien Stroke. *Jurnal Ilmu Kesehatan*, 8(1), 82. <https://doi.org/10.32831/jik.v8i1.259>

Amini, M., Mansouri, F., Vafae, K., Janbakhsh, A., MahdaviKian, S., Moradi, Y., & Fallahi, M. (2022). Factors affecting the incidence and prevalence of pressure ulcers in COVID-19 patients admitted with a Braden scale below 14 in the intensive care unit: Retrospective cohort study. *International wound journal*, 19(8), 2039–2054. <https://doi.org/10.1111/iwj.13804>

Aryani, A., Widiyono, W., & Putra, F. A. (2022). Pemberian Minyak Zaitun Dan Pengaturan Posisi Miring 30 Derajat Menurunkan Kejadian Dekubitus Pada Pasien Stroke. *Jurnal Wacana Kesehatan*, 7(1), 1. <https://doi.org/10.52822/jwk.v7i1.394>

Beatrich Alfika Manu Putri, & Pujiastuti, D. (2024). Case Report: Efektivitas Terapi Mobilisasi Progresif Level I Terhadap Risiko Dekubitus Pada Pasien Yang Terpasang Ventilator Mekanik Di Ruang Intensive Care Unit (ICU) Rumah Sakit Bethesda Yogyakarta. *Jurnal Stikes Bethesda Yakkum Yogyakarta*, 3(1), 199–215.

Bhoki, M. W., Mardiyono, & Sarkum. (2017). Braden Scale and Norton in Predicting Risk of Pressure Sores in ICU Room Skala Braden dan Norton dalam Memprediksi Risiko Dekubitus di Ruang ICU Maria Walburga Bhoki Mardiyono Sarkum Jurusan Keperawatan Poltekkes Kemenkes Semarang. *Skala Braden Dan Norton Dalam Memprediksi Risiko Dekubitus*, 3(2), 581–591. <http://ejournal.poltekkes-smg.ac.id/main/journal/abstrak-journal/0105201410>

Bikle, D. D. (2023). Role of Vitamin D and Calcium Signaling in Epidermal Wound Healing. *Journal of Endocrinological Investigation*, 46(2), 205–212. <https://doi.org/10.1007/s40618-022-01893-5>

Dewardono, I. D. (2014). *Pemanfaatan Vco ( Virgin Coconut Oil ) Dengan Teknik Massage Dalam Penyembuhan Luka*. Pemanfaatan Vco (Virgin Coconut Oil) Dengan Teknik Massage Dalam Penyembuhan Lu Ka Dekubitus Derajat Ii Pada Lansia.

Dewi, R. K., Kabuhung, E. I., & Hidayah, N. (2023). Hubungan Kadar Hb, Perawatan

- Luka Dan Dm Terhadap Kejadian Infeksi Luka Operasi (Ilo) Pada Pasien Post Sc Di Rsud H. Badaruddin Kasim Tanjung. *Jurnal Anestesi*, 2(1), 164–182. <https://doi.org/10.59680/anestesi.v2i1.773>
- Eman S.M Shahin, Theo Dassen, R. J. G. H. (2020). Incidence, Prevention and Treatment of Pressure Ulcers in Intensive Care Patients: A literature review. *International Journal of Nursing Studies*, 29(2), 85–92.
- Hidayat, F., & Aprina, A. (2024). Faktor-Faktor yang Berhubungan dengan Proses Penyembuhan Luka Post Operasi Laparotomy di RSUD Dr. H. Abdoel Moeloek. *Malahayati Nursing Journal*, 6(1), 198–213. <https://doi.org/10.33024/mnj.v6i1.10575>
- Huang, C., Ma, Y., Wang, C., Jiang, M., Yuet Foon, L., Lv, L., & Han, L. (2021). Predictive validity of the braden scale for pressure injury risk assessment in adults: A systematic review and meta-analysis. *Nursing Open*, 8(5), 2194–2207. <https://doi.org/10.1002/nop2.792>
- Iqonul, D. (2015). Peran Perawat Educator dan Pengimplementasian Discharge Planning untuk Pemenuhan Kepatuhan Kontrol Pasien. *The Sun*, 2(3), 10–16. [http://fik.um-surabaya.ac.id/sites/default/files/Artikel\\_2\\_2.pdf](http://fik.um-surabaya.ac.id/sites/default/files/Artikel_2_2.pdf)
- Kuraesin, T. (2009). *Mengenal Luka dan Penangannya* (Vol. 44, Issue 2).
- Malik al Hussain, Riyad Y Al Laham, Hadeel T Alanazi, Taif Alanazi, Reed Alshammari, B. D. A. (2023). Updates on the Causes, Diagnosis, and Management of Peritoneal Abscesses: A Systematic Review. *Cureus*, 15(11). <https://doi.org/10.7759/cureus.48601>
- Moore, Z. E. H., & Cowman, S. (2015). Repositioning for treating pressure ulcers. *Cochrane Database of Systematic Reviews*, 2015(1). <https://doi.org/10.1002/14651858.CD006898.pub4>
- Najihah, Ita Sulistiani, Ferly Yacoline Pailungan, Musdalifah, I Kade Wijaya, Abdul Thalib, Alfian Mas'ud, Takdir Tahir, & Titi Iswanty Afelya. (2022). Reposisi dan Massage Menurunkan Derajat Dekubitus pada Pasien Immobilisasi dengan Gangguan Neurologis: Case Report. *Window of Nursing Journal*, 01(01), 33–47. <https://doi.org/10.33096/won.v1i1.245>
- Palese, A., Luisa, S., Ilenia, P., Laquintana, D., Stinco, G., & Di Giulio, P. (2015). What is the healing time of Stage II pressure ulcers? Findings from a secondary analysis. *Advances in Skin & Wound Care*, 28(2), 69–75. <https://doi.org/10.1097/01.ASW.0000459964.49436.ce>
- Prajayanti, E. D., Primaratri, S., Putri, A. H., Fitri, D., Utami, E., & Putri, D. A. (2024). Peran Nutrisi Dalam Proses Penyembuhan Luka Di Bangsal Budaya RS Universitas Sebelas Maret. *Gudang Jurnal Multidisiplin Ilmu*, 2(November), 174–179.
- Purnawaty, M., Astari, D. W., & Lestari, A. (2024). *PENCEGAHAN PRESSURE ULCER DENGAN MASSAGE EFFLEURAGE DAN VIRGIN COCONUT OIL ( VCO ) : STUDI KASUS*.
- Purwana, E. A., Hartono, D., & Yunita, R. (2023). Hubungan Tingkat Kepatuhan Perawatan dengan Kesembuhan pada Pasien Post Operasi Katarak di Puskesmas Panti. *Jurnal Ilmu Kesehatan Mandira Cendikia*, 2(9), 456–464. <https://journal-mandiracendikia.com/jikmc>
- Qin, Q., Su, J., Liu, J., Chen, R., Wei, W., Yuan, Z., Lai, S., Duan, R., Lai, J., Ye, L., Liang, H., & Jiang, J. (2024). Global, regional, and national burden of fungal skin diseases in 204 countries and territories from 1990 to 2021: An analysis of the global burden of disease study 2021. *Mycoses*, 67(8). <https://doi.org/10.1111/myc.13787>
- Romadhona, F. S., Anggraini, R. B., & Kurniawan. (2023). Hubungan Umur, Kadar Hemoglobin Dan Penyakit Diabetes Melitus Dengan Lama Penyembuhan Luka Operasi Pada Pasien Post Operasi Bedah Umum. *Indonesian Journal of Nursing and Health Sciences*, 4(1), 37–48.
- Sholihah, I., Husain, F., & Widodo, P. (2023). Penerapan Mobilisasi Dan Massage Terhadap

Pencegahan. *Jurnal Ilmu Kesehatan Mandira Cendekia*, 2(1), 20–29.

Sihombing, E. R., Yuniarlina, R., & Supardi, S. (2016). *The Effectiveness of Back Massage Using Virgin Coconut Oil and White Petroleum Jelly To Prevent Pressure Sores*. 1(2).

Simanjuntak, T. R., & Purnama, A. (2020). Efektivitas Mobilisasi Miring Kiri Miring Kanan Dalam Upaya Pencegahan Pressure Injury Pada Pasien Sepsis Di Ruang Instalasi Pelayanan Intensif. *Jurnal Keperawatan Komprehensif (Comprehensive Nursing Journal)*, 6(1), 35–44. <https://doi.org/10.33755/jkk.v6i1.160>

Suprpti, T., Nur, D., & Muslim, A. (2024). Penggunaan Calcium Alginate Dressing

terhadap Penyembuhan Luka DM : Case report. *JOURNAL OF Qualitative Health Research & Case Studies Reports*, 4(2), 170–176.

Utami, E., Saputra, A. U., Harisandy, A., Arsi, R., Studi, P., Keperawatan, S., Kader, U., Studi, P., Ners, P., & Kader, U. (2024). *PASIEN DALAM MERAWAT LUKA DIABETES MELITUS PENDAHULUAN Menurut World Health Organization ( WHO ) Tahun jumlah penderita to ensure healthy lives and well-being for all . Hal ini didasari atas peningkatan prevalensi penyakit tidak menular seperti diabetes d. 16(2), 181–190.*

World Health Organization. (2020). *Anaemia*. [https://www.who.int/health-topics/anaemia#tab=tab\\_1](https://www.who.int/health-topics/anaemia#tab=tab_1)