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EFFECTIVENESS OF REPOSITIONING AND VIRGIN COCONUT OIL EFFLEURAGE MASSAGE IN PREVENTING PRESSURE ULCERS AMONG STROKE PATIENTS: A CASE STUDY

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Abstract

Pressure ulcers are common complications in stroke patients with impaired physical mobility due to prolonged pressure and limited movement. This descriptive case study aimed to evaluate the effectiveness of repositioning and Virgin Coconut Oil (VCO) effleurage massage in preventing pressure ulcers among stroke patients. The study involved two stroke patients with impaired physical mobility and a Braden Scale score ≤17 indicating a high risk of pressure ulcers. Data were collected for three days through interviews, physical examinations, observations, and Braden Scale assessments. The nursing interventions included right–left repositioning every two hours and the application of VCO with effleurage massage twice daily for 15–20 minutes using standard nursing procedures. The results showed that both patients maintained good skin integrity without signs of redness, edema, pain, or new pressure ulcers during the intervention period. Subject I maintained a Braden score of 15, while Subject II maintained a score of 12, both categorized as high risk for pressure ulcers. The combination of repositioning and VCO effleurage massage may help improve skin hydration, peripheral circulation, and pressure redistribution in immobilized stroke patients. These findings suggest that the intervention can be applied as a simple and practical nursing strategy for pressure ulcer prevention in stroke care settings and home care. Further studies with larger samples and longer intervention periods are recommended.

Keywords: Effleurage massage, pressure ulcer prevention, repositioning, stroke, Virgin Coconut Oil.

1. INTRODUCTION

Mobility refers to a person's ability to move freely, easily, and independently in order to meet the physical demands necessary to maintain their health and perform daily activities on their own. Physical limitations affecting one or more body parts are known as mobility impairments (Septianingrum et al., 2024). The inability to move one or more extremities independently is known as a physical mobility impairment, and this is associated with musculoskeletal changes and decreased muscle strength in the elderly; major symptoms of this diagnosis include complaints of difficulty moving the extremities, decreased muscle strength, and reduced range of motion, while minor symptoms include pain during movement, reluctance to move, anxiety during movement, stiff joints, uncoordinated movements, limited movement, and physical weakness (Minarti et al., 2024).

One of the conditions associated with physical mobility impairment is stroke. Stroke is a cerebrovascular disease characterized by rapidly developing clinical symptoms, including focal and global neurological deficits. If there is no clear vascular cause, a stroke can develop, last for 24 hours or more, and result in death. Stroke is a common cerebrovascular disease worldwide, particularly in Indonesia. According to the World Stroke Organization 2022, the global stroke mortality rate is 6,552,724, and the stroke disability rate is 143,232,184. In low- and middle-income countries, stroke incidence increased by 70% between 1990 and 2019, mortality rates rose by 143%, and 101,474,558 people currently living have experienced a stroke, meaning 1 in 4 people aged 25 have experienced a stroke during their lifetime (Aliyyah & Husain, 2024). According to data from the 2018 Basic Health Research (Riskesdas), there are 10.9 stroke cases per 1,000 people in Indonesia, based on diagnoses by healthcare professionals; East Kalimantan Province (14.7%), North Sulawesi (14.2%), the Special Region of Yogyakarta (14.6%), and Central Java (11.8%) are the regions with the highest stroke rates in Indonesia (Aryani et al., 2023). Of the 33 provinces in Indonesia, 14 have a prevalence higher than the national average, including the Special Capital Region of Jakarta, which has an incidence of 9.7%. Of all strokes, two-thirds are ischemic strokes and one-third are hemorrhagic strokes (Septianingrum et al., 2024). In 2019, there were 3,465 elderly patients at Jakarta Sukapura Islamic Hospital between January and December, with 246 (7.1%) of them being stroke patients, based on gender, there were 29 men (55.8%) and 23 women (44.2%) among the 52 elderly stroke patients at Jakarta Sukapura Islamic Hospital in 2019. Based on stroke type, among the 52 elderly stroke patients at Jakarta Sukapura Islamic Hospital in 2019, 49 individuals (94%) experienced ischemic stroke and 3 individuals (5.8%) experienced hemorrhagic stroke (Nadhifah & Sjarqiah, 2022). In stroke patients, the possibility of developing pressure ulcers cannot be ruled out; a pressure ulcer is a term for damage or death of skin tissue extending to the underlying tissue. It can even extend into the muscle and bone due to continuous pressure on a specific area, which disrupts local blood circulation. Pressure ulcers are typically chronic wounds that develop at pressure points in individuals who are unable to move in bed or perform daily activities independently (Septianingrum et al., 2024).

Pressure ulcers affect approximately three million adults in the United States, or an average of 25% of the population; in Europe, pressure ulcers affect 10.5% of people; and in the United Kingdom, the prevalence ranges from 6.7% to 42.7%. In Indonesia, the overall prevalence of pressure ulcers in hospitals is 33% (Pahria & Adiningsih, 2023). According to a global study, the prevalence of pressure ulcers is 63.6%, with Indonesia having the highest prevalence in ASEAN at 33.3%. Approximately 700,000 patients develop pressure ulcers every 2.5 years, and more than 2.5 million Americans develop them annually. Patients suffering from pressure ulcers may experience functional disability, tissue damage, pain, financial burden, and loss of productivity (Hidayati et al., 2024). The high incidence of pressure ulcers indicates that there are still barriers to preventing pressure ulcers in patients, From January to December 2021, there were 107 patients with pressure ulcers at Dr. Soekandar General Hospital in Mojosari subdistrict, Mojokerto regency, comprising 37 female and 70 male patients. This prevalence remains quite high in one of the provinces on the island of Java, specifically East Java, at 53% (Apriyanto & Satiti, 2023).

Pressure ulcers are localized damage to the skin and underlying tissues caused by continuous pressure, friction, or shearing forces, particularly in patients with limited mobility. Stroke patients are at high risk of developing pressure ulcers due to impaired motor function, sensory disturbances, prolonged bed rest, and impaired tissue perfusion. Continuous pressure exceeding capillary pressure can reduce blood flow to the tissues, leading to ischemia, tissue necrosis, and skin damage. Other factors such as advanced age, malnutrition, diabetes mellitus, impaired consciousness, and circulatory disorders further increase the risk of pressure ulcers in stroke patients (National Clinical Guideline Centre, 2014).

Repositioning is one of the primary interventions in the prevention of pressure ulcers because it redistributes pressure on bony prominences and improves tissue perfusion. Regular right–left turning every two hours is recommended in evidence-based nursing practice to reduce prolonged pressure on vulnerable areas such as the sacrum, heels, and trochanters (Shin et al., 2026). In addition to repositioning, topical therapy using Virgin Coconut Oil (VCO) and effleurage massage is increasingly being used to maintain skin integrity. VCO contains medium-chain fatty acids and antioxidants that help maintain skin moisture and improve skin barrier function.

Meanwhile, effleurage massage can stimulate peripheral circulation, improve tissue oxygenation, and reduce friction on the skin's surface. Previous studies have shown that the combination of repositioning and massage therapy effectively reduces the risk of pressure ulcers in immobilized patients (Liputo & Suleman, 2024).

In a study conducted by Nurrohmah et al. (2024) on stroke patients hospitalized with immobility who were at risk of developing pressure ulcers, the application of alternating left-right lateral positioning every 2 hours for 3 days was implemented. Pre- and post-intervention observations of the alternating left-right lateral positioning intervention showed a gradual reduction in redness and pain following the 3-day intervention. The second intervention involved the application of Virgin Coconut Oil (VCO). In a study by Putra et al. (2024), this was found to be effective in reducing the risk of pressure ulcers; the VCO was applied twice daily, with each massage session lasting 15–20 minutes. Although the use of repositioning and VCO massage is becoming increasingly common in nursing practice, research specifically describing this combination of interventions in stroke patients with physical mobility impairments remains limited. Therefore, the author implemented a combination of right-left tilting and VCO application with effleurage massage for the prevention of pressure ulcers in stroke patients to determine the effectiveness of this intervention.

2. METHODOLOGY

This study employed a descriptive case study design to describe the implementation of right–left lateral repositioning and the application of Virgin Coconut Oil (VCO) via effleurage massage in preventing pressure ulcers in stroke patients with physical mobility impairments. The study subjects consisted of two stroke patients hospitalized at the facility and selected using purposive sampling based on the following inclusion criteria: (1) diagnosed with stroke and having physical mobility impairments, (2) experiencing prolonged bed rest or mobility limitations, (3) having a Braden Scale score ≤17 indicating a risk of pressure ulcers, (4) willing to participate in the study, and (5) accompanied by family members during care. Exclusion criteria included patients with stage III–IV pressure ulcers, severe skin infections, or unstable hemodynamic conditions. Data collection was conducted over three consecutive days through interviews, direct observation, physical examination, review of nursing documentation, and assessment using the Braden Scale. The Braden Scale is used to assess the risk of pressure ulcers based on six components: sensory perception, moisture, activity, mobility, nutrition, and friction/shear. The Braden Scale has a maximum score of 23 with risk categories of low risk (>20), moderate risk (16–20), high risk (11–15), and very high risk (<10).

The nursing interventions provided included: (1) Alternating right-left repositioning every two hours in accordance with standard nursing procedures to reduce prolonged pressure on bony prominences, (2) Application of Virgin Coconut Oil (VCO) to areas at risk of pressure ulcers, such as the sacrum, back, heels, and elbows, (3) Effleurage massage performed twice daily for 15–20 minutes using gentle circular motions to improve peripheral circulation and maintain skin moisture. During the intervention period, both subjects continued to receive standard hospital care according to their respective medical conditions. The researchers focused their observations on nursing interventions related to pressure ulcer prevention. Skin integrity was assessed daily using an observation sheet that included skin color, temperature, edema, pain scale, skin moisture, and the presence of redness or signs of pressure ulcers. This study obtained informed consent from patients and their families prior to data collection. Respondent confidentiality was maintained throughout the study. Data analysis was conducted descriptively in the form of narratives and tabulations of Braden Scale scores, as well as the results of skin integrity observations during the intervention period.

This study has several limitations, including a sample size of only two patients, meaning the results cannot yet be widely generalized. Additionally, the intervention period, which lasted only three days, does not allow for an assessment of the long-term outcomes of the intervention. This study also focuses on efforts to prevent pressure ulcers in at-risk patients rather than on patients with severe pressure ulcers.

3. RESULTS

This study began with a preparatory phase that included identifying the problem, determining the intervention objectives, and selecting the appropriate methods to prevent pressure ulcers in patients with physical mobility impairments. Pressure ulcers are a common complication in stroke patients due to immobilization, impaired consciousness, and sensory disturbances, which cause prolonged pressure on specific areas to result in tissue damage. This condition can prolong the length of hospital stay and reduce the patient's quality of life, making prevention a crucial component of nursing care. One preventive measure that can be implemented is a combination of regularly alternating the patient's position from side to side to reduce pressure, along with the application of Virgin Coconut Oil (VCO) using effleurage massage to maintain skin moisture and improve blood circulation. Therefore, this case study aims to describe the effectiveness of this combined intervention in preventing pressure ulcers in stroke patients, with the following results:

Table 1. Respondent Characteristics

Characteristic	Subject I	Subject II
Age	55	61
Gender	Female	Male
Education	Junior High School	Elementary School
Occupation	Housewife	Laborer
Martial Status	Married	Married
Medical History	Type 2 Diabetes	Hypertension

Based on Table 1, the respondents' characteristics show that Subject I is 55 years old, female, has a junior high school education, works as a housewife, is married, and has a history of type 2 diabetes mellitus. Meanwhile, Subject II is 61 years old, male, has an elementary school education, works as a laborer, is married, and has a history of hypertension. In general, both respondents are in the early elderly age group, are married, and have comorbidities that could potentially affect their health during treatment. The results of the evaluation using the Braden scale for Subject I and Subject II are shown in the table below:

Table 2. Braden Scale Assessment

Risk Factors	Subject I			Subject II		
	Day 1	Day 2	Day 3	Day 1	Day 2	Day 3
Sensory Perception	3	3	3	2	2	2
Moisture	4	4	4	4	4	4
Activity	1	1	1	1	1	1
Mobility	2	2	2	1	1	1
Nutrition	3	3	3	3	3	3
Friction with the mattress surface	2	2	2	1	1	1

Based on Table 2, the results of the Braden Scale assessment for both subjects over three days showed relatively stable scores for each risk factor. For Subject I, sensory perception was 3, moisture 4, activity 1, mobility 2, nutrition 3, and friction with the mattress surface 2. Meanwhile, for Subject II, the scores were sensory perception 2, moisture 4, activity 1, mobility 1, nutrition 3, and friction with the mattress surface 1. In general, Subject II has a higher level of pressure ulcer risk compared to Subject I, particularly regarding mobility, sensory perception, and friction.

Table 3. Evaluation of VCO Oil Application Using the Effleurage Massage Technique

Subject	Signs of pressure ulcer risk	Day 1	Day 2	Day 3
Subject I	Skin Color	Dry and no redness	Dry and no redness	Dry and no redness
	Temperature	Warm	Warm	Warm
	Swelling	No	No	No
	Pain	0	0	0

Subject	Signs of pressure ulcer risk	Day 1	Day 2	Day 3
Subject II	Skin Color	Dry and no redness	Dry and no redness	Dry and no redness
	Temperature	Warm	Warm	Warm
	Swelling	No	No	No
	Pain	0	0	0

Based on Table 3, the results of the evaluation of VCO oil application via effleurage massage on both subjects over three days showed good skin condition and no signs of pressure ulcer risk. In both Subject I and Subject II, the skin remained dry with no redness; skin temperature felt warm; no swelling was observed; and the pain scale was 0 from Day 1 through Day 3. Overall, these results indicate that the application of VCO oil with effleurage massage helps maintain skin integrity and prevent the onset of early signs of pressure ulcers during the observation period.

Table 4. Changes in Skin Integrity During the Intervention

Observations	Subject I Day 1	Subject I Day 3	Subject II Day 1	Subject II Day 3
Skin Color	Normal	Normal	Normal	Normal
Redness	None	None	None	None
Skin Moisture	Moist	Moist	Moist	Moist
Skin Temperature	Warm	Warm	Warm	Warm
Edema	None	None	None	None
Pain Scale	0	0	0	0
Signs of Pressure Ulcers	None	None	None	None

Table 4 shows that during the three-day intervention period, both subjects exhibited stable skin integrity with no signs of pressure ulcer development. No redness, skin damage, edema, or pain was observed in pressure-prone areas such as the sacrum, heels, elbows, and back. Subject I, who has a history of type II diabetes mellitus, showed relatively stable conditions during the intervention period despite having a higher risk of impaired tissue perfusion and delayed wound healing. The combination of repositioning and VCO massage is believed to help maintain skin moisture and reduce excessive pressure on bony prominences. Subject II, who had a history of hypertension and a smoking habit, showed lower mobility scores and a lower risk of friction compared to Subject I. However, no deterioration in skin condition was observed during the intervention. This suggests that regular repositioning and effleurage massage using VCO can help maintain skin integrity even in patients with more severe mobility limitations.

4. DISCUSSION

Based on the results of the case study, the characteristics of the two subjects are as follows: Subject I, Mrs. M, is 55 years old, and Subject II, Mr. K, is 61 years old. The risk of stroke increases with age. This is related to the aging process, which is a normal process of degradation. Plaque buildup causes blood vessels to harden in older adults. Blood flow to the body, particularly to the brain, decreases due to excessive plaque buildup (Hidayah et al., 2022). Stroke can affect people of any age group. However, advancing age increases the risk of stroke. This is caused by plaque buildup in blood vessels. The risk of stroke doubles every ten years after age fifty-five, and its incidence increases with age. The mortality rate from stroke also doubles every ten years after age 40. By age 80, one in three individuals will experience more than one stroke (Marlina & Soraya, 2025).

The results of the case study show that Subject I is female and Subject II is male. Men are at greater risk of stroke than women because they are more likely to smoke. The greatest risk associated with smoking is that it damages the lining of the body's blood vessels (Hidayah et al., 2022). Stroke affects men more frequently than women (1.3:1), except during menopause, when

the ratio is nearly equal. However, women account for more than half of stroke-related deaths. Women who take birth control pills and have hypertension are also at higher risk of stroke (Marlina & Soraya, 2025).

Subject I had no history of hypertension, but following a sudden stroke, Mrs. M developed hypertension with a blood pressure of 195/100 mmHg. Subject II, on the other hand, already had a history of hypertension and was admitted to the hospital with complaints of severe dizziness and a blood pressure of 181/91 mmHg. Hypertension, or blood pressure exceeding 160/95 mmHg, is the most common and modifiable risk factor. A reduction in diastolic blood pressure of 5–6 mmHg can reduce the risk of stroke by up to 40%. Blood pressure at the upper limit of the normal range (between 120/80 and 129/89 mmHg) can increase the risk of stroke and cardiovascular disease when combined with other risk factors (Nurfikri et al., 2024). In addition, Subject I has type 2 diabetes mellitus and is taking metformin; there is a foot ulcer on the left toes, whereas Subject II does not have diabetes mellitus and has no history of the disease. Strokes can occur in people with diabetes mellitus. Generally, people with diabetes have blood vessels that are less flexible or stiffer. This occurs when blood sugar levels suddenly rise or fall, which can lead to brain death (Hidayah et al., 2022). Additionally, Subject II has been smoking since adolescence to the present. According to several studies, smokers have higher blood fibrinogen levels compared to non-smokers. High fibrinogen levels can cause thickening of the blood vessel walls, resulting in narrower and stiffer blood vessels. This can lead to blood flow problems because the blood vessels become narrower and stiffer (Hidayah et al., 2022).

The results of the study indicate that a combination of right–left lateral repositioning and the application of Virgin Coconut Oil (VCO) via effleurage massage helps maintain skin integrity and prevent the development of pressure ulcers in stroke patients with impaired physical mobility. Over the three-day intervention period, no redness, edema, pain, or skin damage was observed in either subject. Regular repositioning helps reduce prolonged pressure on bony prominences and improves tissue perfusion, while the application of VCO with effleurage massage helps maintain skin moisture and improve peripheral circulation. Although both subjects had risk factors such as diabetes mellitus, hypertension, and a history of smoking, no clinical signs of pressure ulcers were found during observation. This suggests that the combination of repositioning and effleurage massage using VCO has the potential to help prevent the worsening of skin conditions in high-risk patients.

Based on the findings of Parwata & Suharto (2022), prior to the implementation of left-right lateral positioning and the application of VCO oil via effleurage massage, the patient exhibited symptoms of limb weakness, high dependency on assistance for activities, and severely limited mobility. The Braden scale assessment yielded a score of 11, with criteria indicating impaired perception-responding only to pain stimuli-high skin moisture requiring linen changes 2–3 times daily, the patient was completely bedridden, unable to change body position without assistance, able to consume only a quarter of the provided food portion, and experienced frequent friction due to the patient easily slipping off the bed and requiring assistance each time repositioning was performed, after implementing right-left turning interventions and applying VCO oil for 15–30 minutes, significant improvements were observed in the patient's skin condition and mobility; these changes were recorded gradually through an increase in the Braden scale score. This intervention is consistent with the study conducted by Kusuma and Agustian (2023), prior to the implementation of the left-right tilting intervention and the application of VCO oil using the effleurage massage technique, the patient-who was in a state of total bed rest due to a stroke-exhibited limited mobility resulting from prolonged supine positioning, redness on the sacrum, heels, and back, and a Braden scale assessment score of ≤ 16; after the right-left tilting intervention and the application of VCO oil using the effleurage massage technique, the results showed no signs of pressure ulcers, normal skin color, the redness had disappeared, and the skin felt moist and was not scaly.

Based on the results of a case study on the implementation of left-right tilting and the application of VCO oil using effleurage massage, on the first day for Subject I, prior to the intervention, vital signs-including blood pressure, pulse, respiratory rate, and temperature-were first observed. An evaluation was then conducted over 3 days using the Braden scale, which showed a score of 15, indicating a high risk of pressure ulcers. The administration of VCO oil with

effleurage massage over 3 days revealed no signs of redness, no edema, no pain, and a warm temperature, whereas for Subject II, prior to the intervention, vital signs-including blood pressure, temperature, pulse, and respiration-were first observed. During the intervention, the subject was positioned on their right and left sides, and VCO oil was administered via effleurage massage for 3 days. The assessment using the Braden Scale yielded a score of 11, indicating a high risk of pressure ulcers, and the application of VCO oil showed no redness, warm skin temperature, no edema, and no pain. The results of the intervention conducted by the author align with the study by Badrujamaludin et al. (2022), which states that the intervention of alternating left-right repositioning and the application of VCO oil with effleurage massage has been clinically proven to reduce the risk of pressure ulcers in patients with physical mobility impairments; progressive mobilization effectively reduces direct pressure on vulnerable areas. Meanwhile, VCO oil maintains skin moisture and elasticity, thereby reducing the risk of tissue damage.

5. CONCLUSIONS

The implementation of a combined intervention involving alternating right-left positioning and the application of VCO oil via effleurage massage aims to prevent the development of pressure ulcers in stroke patients. The assessment results showed that both subjects were at high risk for pressure ulcers, with Subject I scoring 15 and Subject II scoring 12. During the observation period, the application of VCO oil with effleurage massage was shown to help maintain skin integrity and prevent the appearance of early signs of pressure ulcers. Therefore, the right-left lateral positioning intervention combined with the application of VCO oil and effleurage massage is recommended for patients with physical mobility impairments as a preventive measure against pressure ulcers.

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