

Educational Management of Effleurage Massage Therapy with Virgin Coconut Oil for Families of Stroke Patients

Carissa Muthia Putri Nugroho^{1*} | Ati Surya Mediawati²

¹ Professional Nurse Program, Faculty of Nursing, Padjadjaran University

² Department of Fundamental Nursing, Faculty of Nursing, Padjadjaran University

* Correspondence: carissa20002@mail.unpad.ac.id

Submitted : 03 - 07 - 2025

Reviewed : 07 - 07 - 2025

Accepted : 06 - 12 - 2025

ABSTRACT

Introduction: Effleurage massage therapy using virgin coconut oil (VCO) shows promise in preventing pressure ulcers in stroke patients by improving circulation and skin health.

Objectives: This study aims to determine the application of effleurage massage therapy education with VCO on the knowledge of families caring for stroke patients in the HCU room of one of the highest referral hospitals in West Java.

Method: A descriptive exploratory case study involved physical assessments, interviews, and direct observations. Participants completed a pre-test questionnaire, followed by a post-test after the educational intervention. Data were analyzed using the 3M approach.

Results: The Man aspect shows that there are 30 nurses, and none of them have massage therapy expertise. The Method aspect shows that effleurage massage therapy with VCO has not been implemented. The material aspect shows that VCO is not yet available in the room. There was a significant increase in the knowledge score of the family, from an initial score of 40 to 100 after the intervention.

Conclusion: Providing education on effleurage massage therapy with VCO to families of stroke patients is effective in increasing family knowledge about massage therapy.

Keyword: Effleurage massage, nursing management, pressure ulcer, stroke, virgin coconut oil

Jurnal Keperawatan Duta Medika diterbitkan oleh Universitas Duta Bangsa Surakarta.

Website: ojs.udb.ac.id

Introduction

A stroke is a critical medical issue caused by reduced blood flow to the brain, leading to damage to brain cells and notable functional impairments. Cerebrovascular disease is a broad term that encompasses disorders of the central nervous system resulting from interruptions in the blood supply to the brain (Hinkle, J. L., & Cheever, K. H., 2018). This condition is characterized by sudden, localized neurological deficits resulting from vascular injuries, such as tissue death or bleeding in the central nervous system (Murphy, S. J., & Werring, D. J., 2020).

A study by the Global Burden of Disease (GBD) found that stroke ranks as the second leading cause of death globally and the third leading cause of death and disability (Feigin et al., 2022). The 2021 GBD report shows that within non-communicable diseases (NCDs), stroke remains the second leading cause of death, responsible for 7.3 million deaths, and is the third leading cause of disability worldwide. The research indicates that the stroke burden has increased from 1990 to 2021, alongside a rise in several associated risk factors. Incident strokes accounted for 70% of all stroke fatalities and 32% of disability-adjusted life-years lost (DALYs). Over the past decade, the incidence of ischemic and hemorrhagic strokes in middle- to high-income nations has risen overall, reaching between 85 and 94 per 100,000 people; however, this number is significantly higher—ranging from 1,151 to 1,216 per 100,000—for individuals aged 75 years and older (Murphy, S. J., & Werring, D. J., 2020). In 2021, there were 93.8 million cases of prevalent strokes and 11.9 million new strokes, with 6.3 million (52.6%) occurring in men and 5.7 million (47.4%) in women.

Stroke can lead to significant motor impairment, resulting in immobilization due to partial or complete paralysis of a limb. When a person is immobilized, the skin and underlying tissues are exposed to pressure from surfaces like mattresses or chairs. Prolonged pressure disrupts blood flow, leading to reduced oxygen supply (hypoxia), tissue damage, and the formation of pressure ulcers. Areas of the body with bony prominences and weight-bearing surfaces are particularly susceptible to pressure ulcers, as they are covered only by skin and minimal soft tissue. Vulnerable regions include the sacrum, coccygeal area, ischial tuberosities, heels, knees, and other locations. The development of pressure ulcers is influenced by external factors (e.g., pressure, friction, shear forces, and moisture) as well as internal factors (e.g., fever, malnutrition, anemia, and vascular dysfunction) (Alito et al., 2023). Preventive care tailored to these factors is crucial for reducing incidence and improving outcomes for stroke patients.

Family involvement is essential in preventing pressure ulcers, especially in stroke patients with mobility limitations. Research conducted by Kartika & Hayati (2023) demonstrated a significant correlation between family knowledge and efforts to prevent pressure ulcers. The greater the family's knowledge, the more involved they are in preventive measures, thereby minimizing the risk of pressure ulcers in patients. Other studies suggest a positive correlation between knowledge, attitudes, and practices, indicating that improved knowledge and attitudes can enhance pressure ulcer prevention practices (Sari et al., 2025). Consequently, increasing family knowledge and involvement is a key factor in successfully preventing pressure ulcers in bedridden patients.

Massage therapy can be an effective intervention in preventing pressure ulcers for stroke patients. One massage technique that improves blood flow is effleurage. Effleurage massage significantly enhances blood circulation, ensuring an adequate oxygen supply that helps prevent pressure ulcers (Sari et al., 2023). This technique involves slow, gentle movements performed once or twice daily (Nisak, K., Kristinawati, B., & Widayati, N., 2019). The use of lubricant is essential during effleurage massage to facilitate smooth movements and enhance the technique's overall effectiveness.

Research has shown that effleurage massage with virgin coconut oil (VCO) can effectively reduce the risk of pressure ulcers in bedridden patients (Mutiarra et al., 2024). VCO has moisturizing effects that help prevent dryness and irritation. Additionally, it contains antioxidants and vitamin E, which protect skin cells from oxidative damage, support skin integrity, and promote the healing of early tissue damage caused by pressure and friction (Fernanda & Yanto, 2023; Purnawaty et al., 2024; Andayani et al., 2023). A literature review conducted by Kusuma and Agustian (2023) demonstrated that applying effleurage massage therapy with virgin coconut oil (VCO) for three to seven consecutive days, for a duration of ten to twenty minutes, can improve skin moisture and softness in patients. This treatment effectively eliminates signs of pressure ulcers.

Effective interventions for preventing pressure ulcers are essential for minimizing complications in healthcare settings. As a result, numerous healthcare facilities worldwide consider pressure ulcer prevention an essential part of patient care (Getie et al., 2020). Nursing management plays a vital role in ensuring that pressure ulcer prevention strategies are consistently and effectively implemented by the entire nursing team. To facilitate this, nursing management can adopt the 5M approach: Man (nurses as the human resources involved), Method (the methods used to implement care), Material (the equipment used for care), Money (funding), and Machine (technology and infrastructure) (Saputro et al., 2022). In practice, emphasis is placed on Man, Method, and Material, as these three components significantly influence the nursing care delivery process.

In addition to this approach, family education merges the elements of Man and Method, with nurses serving as educators and employing educational strategies to enhance family support in caring for stroke patients. Families provide valuable emotional support and actively engage in executing the care plan, ultimately improving the quality of care. Given this context, this study aims to evaluate the application of effleurage massage therapy education with VCO for the families of stroke patients in the High Care Unit (HCU).

Method

This research utilized a case study approach with descriptive methods. Data collection took place in the High Care Unit (HCU) of a leading referral hospital in West Java on March 15, 2025. The participants in this study were family members of the patients. Primary data were gathered through interviews and observations within the unit, while secondary data were obtained from the patients' medical records. Data collection procedures were conducted after receiving approval from the hospital ward.

The intervention included education and role-playing demonstrations focused on effleurage massage therapy using virgin coconut oil (VCO). The Man, Method, and Material (3M) approach was applied during the intervention. The researcher utilized education and role-playing demonstration methods. Before the education session, the researcher administered a pre-test with five questions to assess the family's knowledge of effleurage massage therapy. Following this, the researcher provided education and demonstrated the effleurage massage therapy using VCO.

Results

Table 1 presents the scores achieved by participants before and after receiving education on effleurage massage therapy using virgin coconut oil (VCO). Before the educational session and role-playing demonstration, a pre-test was conducted to assess the participants' knowledge level, resulting in an average score of 40. Following this, the participants attended a 30-minute educational session and demonstration. Afterward, they completed a post-test to evaluate their knowledge after the training. The post-test score significantly increased to 100, reflecting a 60% improvement. Throughout the education and demonstration, participants appeared to engage attentively, and they reported that they understood the material presented. They also expressed confidence in their ability to practice the effleurage massage techniques they learned.

Table 1. Pre-Test and Post-Test Results of Effleurage Massage Therapy Education with VCO in Families of Stroke Patients

Description	True	False	Score
Pre - Test	2	3	40
Post - Test	5	0	100

The Man aspect assessment revealed that there were 30 nurses in the High Care Unit (HCU), with educational backgrounds ranging from Nursing Associate Degrees to Bachelor's and Master's degrees in Nursing. This diversity indicates a variation in competency concerning the implementation of nursing care. Additionally, the nurse-to-patient ratio per shift was found to be either 1:4 or 1:5, meaning each nurse was responsible for four to five patients at a time.

Discussion

Observations and interviews related to the Method and Material aspects showed that the primary focus of care in the HCU remained centered on the medical management of acute stroke patients. The lack of nurses skilled in massage therapy further contributed to the deficiency in non-pharmacological interventions, such as effleurage massage therapy using virgin coconut oil (VCO). It appeared that VCO was often provided independently by the patients' families, as it was considered a personal need.

In nursing, the Man, Method, and Material approaches are employed to ensure that nursing interventions are systematic, effective, and comprehensive. The Man aspect primarily emphasizes the personnel administering the interventions. Nurses trained in massage therapy can offer comfort and promote relaxation through massage as part of holistic care. However, for the treatment of certain physical conditions or during rehabilitation, medical personnel in the ICU recommend that massage be performed by trained professionals to ensure the therapy's safety (Zwoliński et al., 2025). Nurses with solid training and high-quality knowledge and skills are deemed capable of applying their expertise, resulting in more effective management and coordination of patient care (Zhao et al., 2024; Alanazi et al., 2023).

It is important to note that the educational background of nurses also plays a significant role. Research conducted by Rahman et al. (2015) found that the level of nursing education did not correlate with treatment outcomes in private hospitals in Malaysia. Given this finding, nurses from various educational backgrounds might consider participating in massage therapy training to enhance their skills.

Nurses who are knowledgeable and skilled in effleurage massage therapy can effectively incorporate this technique into patient care. Additionally, they can educate families about the benefits of effleurage massage therapy using virgin coconut oil (VCO). Involving families in the care process is crucial for improving patient outcomes.

Research conducted by Nuzulullail et al. (2023) indicates that educating family members of stroke patients about effleurage massage therapy with VCO can significantly enhance their understanding and ability to perform the therapy. Families were trained to administer effleurage massage twice daily, following initial instruction from healthcare professionals. This approach decreases the pressure ulcer scores and reduces pain complaints in the affected areas. Another study highlighted a reduced risk of pressure ulcers, as evidenced by an improved Braden scale score, among stroke patients with decreased consciousness and weakness. This improvement is attributed to the benefits of effleurage massage, which enhances blood circulation, and the properties of VCO, which is rich in antioxidants and vitamin E, thereby moisturizing and nourishing the skin (Adevia et al., 2022).

However, implementing massage therapy interventions can increase nurses' workloads, particularly when the nurse-to-patient ratio is not balanced. A higher number of nurses correlates with lower mortality rates, reduced infection rates, and shorter hospital stays. For every additional nurse, patients are 14% less likely to die in the hospital. Thus, ensuring an adequate number of nurses with a balanced workload is essential for maintaining high-quality care and positive patient outcomes (McHugh et al., 2021).

For a nurse-to-patient ratio of 1:4 or 1:5, it is necessary to develop a suitable strategy for implementing massage therapy interventions. In practice, nurses are responsible not only

for direct patient care but also for various indirect activities such as documentation, communication, meetings, visits, reporting, administration, and logistical tasks. These duties are often overlooked when calculating nurse-to-patient ratios (Sharma & Rani, 2020). According to Lee et al. (2021), one effective strategy is to integrate effleurage massage therapy into routine care activities, such as personal hygiene or patient repositioning. This approach helps maximize time efficiency while ensuring that other responsibilities are not neglected.

When caring for stroke patients who are on bed rest, the focus should extend beyond the patient to include their family members, who play a vital role in their care. Nurses can aid in this process by educating families on how they can support their loved ones, including the application of massage techniques like effleurage. The gentle, soft strokes characteristic of effleurage promote relaxation and help reduce muscle tension, making it an ideal technique for individuals recovering from a stroke.

Research conducted by Rodrigues et al. (2020) demonstrated that effleurage massage enhances blood flow in the lower extremities, evidenced by lower blood pressure and pulse rates. Additionally, the relaxing effects of the massage are believed to increase the sensitivity of blood vessel baroreceptors, which help regulate blood pressure (Astuti et al., 2022). Alfasyi and Sudaryanto (2025) highlighted the importance of knowledge in managing blood pressure, particularly in relation to the effleurage massage technique utilizing virgin coconut oil (VCO). Jelen et al. (2024) found that massage significantly reduced stiffness in the proximal upper trapezius muscle for up to three weeks after the intervention. Another study found that a 30-second application of effleurage massage on the anterior surface of the knee, extending down to the hip, can improve knee joint function and alleviate pain. This massage technique applies consistent pressure on the tensor fascia lata, quadriceps, sartorius, and gracilis muscles (Akramzadeh et al., 2024).

When it comes to materials, the massage proved to be more effective when using virgin coconut oil (VCO), which is known for its moisturizing and nourishing properties. Other common natural oils found in skincare include argan, grapeseed, jojoba, olive, rosehip, and sweet almond oils. Coconut oil is derived from the seeds of the *Cocos nucifera* palm and contains higher levels of saturated fatty acids, predominantly short-chain fatty acids such as caprylic, capric, lauric, and myristic acids. Consequently, coconut oil is solid at room temperature and serves as a moisturizer and skin softener (McMullen, 2024; Ezzat et al., 2021). VCO is available at health food stores, online marketplaces, and from reputable suppliers. In Indonesia, the price of VCO varies depending on the brand, quality, and packaging size, with one study indicating prices starting around IDR 55,000 per 250 mL (Retno et al., 2016) and another noting a price of IDR 200,000 per liter from a home business (Dita et al., 2023).

A recent study revealed a significant reduction in pressure ulcer incidence following an effleurage massage intervention using VCO. Before the intervention, most patients were classified as having a moderate risk for pressure ulcers, with only a small proportion falling into the low and high risk categories. After the intervention, 71.4% (10 respondents) were reclassified as low risk, while 14.3% (2 respondents) were categorized as having no risk, and another 14.3% (2 respondents) remained at moderate risk (Lorencs et al., 2025). Az Zahra et al. (2023) reported that performing effleurage massage with VCO once or twice daily for 7 days in the intervention group proved effective in maintaining or reducing the risk of pressure ulcers in non-hemorrhagic stroke patients who are at risk. Additionally, research by Darmareja et al. (2020) on 34 immobilized ICU patients indicated that undergoing effleurage massage with VCO for 20 minutes over three days resulted in improved Braden scale scores, reflecting a reduced risk of pressure ulcers post-intervention. These findings

support the various positive implications of incorporating effleurage massage therapy with VCO into patient care, backed by the expertise of nurses in massage therapy.

Effleurage massage therapy using VCO is a method that nurses can consider to reduce the risk of pressure ulcers in patients. This approach can be guided by the 3M concept: Man, Method, and Material. From the Human perspective, nurses can educate and guide patients and their families about the importance of preventing pressure ulcers through appropriate interventions, including effleurage massage therapy. In terms of Method, effleurage massage is performed with gentle, rhythmic movements to enhance blood circulation and maintain skin integrity. The use of VCO as a natural massage lubricant further moisturizes and protects the skin from irritation. Regarding the Material aspect, VCO and any additional materials or tools not available in the treatment room can be provided independently by the family, fostering greater family involvement and independence in supporting the care process.

Conclusion and Suggestion

Effleurage massage therapy with virgin coconut oil (VCO) has not been implemented by ward nurses for the families of stroke patients due to a lack of nurses trained in massage therapy. Therefore, it may be beneficial for nurses to participate in massage therapy training, which could then be applied in the patient care process by educating the families of stroke patients. However, this study has several limitations. The number of participants in the study was not clearly defined, and the research employed a case study methodology. Consequently, the findings are not intended for generalization and are specific to this particular investigation. Furthermore, the analysis primarily focused on the management aspect of 3M, excluding consideration of other external factors that may influence the results. Consequently, further research should involve a larger sample size and consider additional management variables to enhance the findings of this study.

Acknowledgement

The researcher expresses sincere appreciation for the invaluable support, guidance, and encouragement received throughout this research project. These contributions have been essential in improving the article's rigor and quality.

References

- Adevia, Dewi, N. R., & Ayubbana, S. (2022). Penerapan *Massage Effleurage* Menggunakan VCO (*Virgin coconut oil*) Terhadap Pencegahan Dekubitus Pada Pasien Stroke Di Ruang Saraf Rsud Jend. Ahmad Yani Metro. *Jurnal Cendikia Muda*, 2(1).
- Akramzadeh, M., Hosseini, S. M., Zavieh, M. K., Khademi-Kalantari, K., & Baghban, A. A. (2024). The Effect of Single-Session Stimulating *Massage* on the Knee Joint Position Sense in Healthy Older Adult Men: A Randomized Crossover Trial. *International journal of therapeutic massage & bodywork*, 17(2), 4–11. <https://doi.org/10.3822/ijtmb.v17i2.961>.
- Alanazi, W. M. R., Alanazi, B. A. Q., Alanazi, A. I., Alanazi, H. H. F., Alenezi, N. A. K., Alruwaili, D. A. M., Alanazi, A. M. H., Alanazi, S. O. S., Alanazi, H. B. H., & Alanazi, M. H. (2023). The Impact of Nurse Education on Patient Safety and Quality Control. *Saudi Journal of Nursing and Health Care*, 6(12), 501–505. <https://doi.org/10.36348/sjnhc.2023.v06i12.006>.

- Alfasyi, K. A., & Sudaryanto, A. (2025). Hubungan Tingkat Pengetahuan Dengan Upaya Pengendalian Hipertensi Pada Lansia Di Puskesmas Kartasura. *Jurnal Keperawatan Duta Medika*, 5(1), 1–8. <https://doi.org/https://doi.org/10.47701/dutamedika.v5i1.4742>.
- Alito, A., Portaro, S., Leonardi, G., Ventimiglia, C., Bonanno, F., Fenga, D., Sconza, C., & Tisano, A. (2023). Pressure Ulcers—A Longstanding Problem: A 7-Year Neurorehabilitation Unit Experience of Management, Care, and Clinical Outcomes. *Diagnostics*, 13(20), 3213. <https://doi.org/10.3390/diagnostics13203213>.
- Andayani, R. P., Fitri Wahyuni, S., Ausrianti, R., Reni, I., Edo, C. W. D., & Amir, H. (2023). Effectiveness of *Virgin coconut oil* and Regular Repositioning in Preventing Pressure Ulcers in Children. *Medical Journal of Malaysia*, 78(4), 511–514.
- Annas, A. (2015). Market of Indonesian *Virgin coconut oil*. *Scientific Journal of PPI-UKM*, 2(6), 251–254.
- Astuti, N. L. S., Wisnawa, I. N. D., & Astawa, I. G. S. (2022). The Impact of Effleurage Technique Massage on Blood Pressure toward Elderly Hypertension in Peguyangan Village. *Nursing and Health Sciences Journal (NHSJ)*, 2(3), 280–284. <https://doi.org/10.53713/nhs.v2i3.155>.
- Az Zahra, A. A., Supriyadi, & Dwiningsih, S. U. (2023). Pengaruh *Massage Effleurage* dengan *Virgin coconut oil* (VCO) terhadap Pencegahan Risiko Dekubitus pada Pasien Stroke Non Hemoragik. *Jurnal Ilmiah Permas: Jurnal Ilmiah STIKES Kendal*, 13(2), 665–672. <https://doi.org/10.32583/pskm.v13i2.785>
- Bahouth, M. N., Deluzio, S., Pruski, A., & Zink, E. K. (2023). Nonpharmacological Treatments for Hospitalized Patients with Stroke: A Nuanced Approach to Prescribing Early Activity. *Neurotherapeutics: the journal of the American Society for Experimental NeuroTherapeutics*, 20(3), 712–720. <https://doi.org/10.1007/s13311-023-01392-2>.
- Darmareja, R., Kosasih, C. E., & Priambodo, A. P. (2020). The Effect Of *Effleurage Massage* Using *Virgin coconut oil* On The Risk Level Of Pressure Ulcers In Intensive Care Unit Patients. *Jurnal Keperawatan Soedirman*, 15(3). <https://doi.org/10.20884/1.jks.2020.15.3.1201>.
- Dita, R., Rianse, I. S., & Zani, M. (2023). Analysis of Added Value of Coconut Processing into *Virgin coconut oil* (VCO) in The Al-Huda Household Business in Lasalepa Village, Lasalepa District, Muna Regency. *International Journal of Technology and Education Research*, 1(4), 84–94.
- Ezzat, S. M., Bishbishy, M. H. E., Kersh, D. M. E., Zayed, A., Salem, M. A., & Salama, M. M. (2021). Herbal cosmeticology. In: Preparation of phytopharmaceuticals for the management of disorders. *The development of nutraceuticals and traditional medicine*, 129–168. <https://doi.org/https://doi.org/10.1016/B978-0-12-820284-5.00022-8>.
- Feigin, V. L., Brainin, M., Norrving, B., Martins, S., Sacco, R. L., Hacke, W., Fisher, M., Pandian, J., & Lindsay, P. (2022). World Stroke Organization (WSO): Global Stroke Fact Sheet 2022. *International journal of stroke : official journal of the International Stroke Society*, 17(1), 18–29. <https://doi.org/10.1177/17474930211065917>.
- Fernanda, M., & Yanto, A. (2023). Penerapan Pijat *Effleurage* Menggunakan *Virgin coconut oil* Dalam Menurunkan Risiko Pressure Ulcer Pada Pasien Dengan Stroke Non Hemoragik. *Ners Muda*, 4(2), 153. <https://doi.org/10.26714/nm.v4i2.10296>.
- GBD 2021 Stroke Risk Factor Collaborators (2024). Global, regional, and national burden of stroke and its risk factors, 1990–2021: a systematic analysis for the Global Burden of Disease Study 2021. *The Lancet. Neurology*, 23(10), 973–1003. [https://doi.org/10.1016/S1474-4422\(24\)00369-7](https://doi.org/10.1016/S1474-4422(24)00369-7).
- Getie, A., Baylie, A., Bante, A., Geda, B., & Mesfin, F. (2020). Pressure ulcer prevention practices and associated factors among nurses in public hospitals of Harari regional state and Dire Dawa city administration, Eastern Ethiopia. *PLOS ONE*, 15(12), e0243875. <https://doi.org/10.1371/journal.pone.0243875>.
- Hidayati, N. (2019). PENGARUH MASSAGE TEKNIK EFFLEURAGE TERHADAP TEKANAN DARAH PADA PENDERITA HIPERTENSI DI WILAYAH KERJA PUSKESMAS

- KEMUNINGSARI KIDUL. *Skripsi*. Tidak Diterbitkan. Jember: Universitas Muhammadiyah Jember. <https://repository.unmuhjember.ac.id/7446/11/LAMPIRAN.pdf>.
- Hinkle, J. L., & Cheever, K. H., (2018). *Brunner & Suddarth's textbook of medical-surgical nursing*. 14th edition. Philadelphia, Wolters Kluwer.
- Jelen, A., Javornik, E., Meh, S. G., & Kozinc, Ž. (2024). The effect of a 5-week therapeutic *massage* on erector spinae and upper trapezius muscle stiffness as determined by shear-wave elastography: a randomized controlled trial. *Frontiers in Sports and Active Living*, 6(August), 1–11. <https://doi.org/10.3389/fspor.2024.1428301>.
- Kartika, A., & Hayati, M. (2023). The Relationship Of Family Knowledge With Preventing Decubitus Ulcers In Total Bedrest Patients In The Icu H. Sahudin Kutacane Hospital. *Jurnal Eduhealth*, 14(04), 2023. <http://ejournal.seaninstitute.or.id/index.php/health>.
- Kusuma, A. S., & Agustian, B. C. (2023). Pengaruh *Massage* dengan *Virgin coconut oil* (VCO) untuk Mencegah Luka Dekubitus pada Pasien Stroke Hemoragik. *Jurnal Kesehatan*, 12(2), 357–367. <https://doi.org/10.46815/jk.v12i2.149>.
- Lee, Y., Lee, J., Kim, J., & Jung, Y. (2021). Non-Pharmacological Nursing Interventions for Prevention and Treatment of Delirium in Hospitalized Adult Patients: Systematic Review of Randomized Controlled Trials. *International journal of environmental research and public health*, 18(16), 8853. <https://doi.org/10.3390/ijerph18168853>.
- Lorencs, F., & Hasibuan, M. T. D. (2025). Pengaruh *Massage* Dengan *Virgin coconut oil* Untuk Mencegah Luka Tekan Pada Pasien Stroke Dengan Tirah Baring Lama di Ruang ICU RS Murni Teguh Sudirman Jakarta. *Jurnal Keperawatan Cikini*, 6(1), 64–75. <https://doi.org/10.55644/jkc.v6i01.231>.
- McHugh, M. D., Aiken, L. H., Sloane, D. M., Windsor, C., Douglas, C., & Yates, P. (2021). Effects of nurse-to-patient ratio legislation on nurse staffing and patient mortality, readmissions, and length of stay: a prospective study in a panel of hospitals. *Lancet (London, England)*, 397(10288), 1905–1913. [https://doi.org/10.1016/S0140-6736\(21\)00768-6](https://doi.org/10.1016/S0140-6736(21)00768-6).
- McMullen, R. L. (2024). The benefits and challenges of treating skin with natural oils. *International Journal of Cosmetic Science*, 46(4), 553–565. <https://doi.org/10.1111/ics.12960>.
- Murphy, S. J., & Werring, D. J. (2020). Stroke: causes and clinical features. *Medicine (Abingdon, England : UK ed.)*, 48(9), 561–566. <https://doi.org/10.1016/j.mpmed.2020.06.002>.
- Mutiara, R., Mukti, K., & Silvitasari, I. (2024). Penerapan *Massage Effleurage* dengan *Virgin coconut oil* (Vco) Terhadap Resiko Dekubitus pada Pasien Tirah Baring di Wilayah Kerja Puskesmas Kartasura. *Quantum Wellness: Jurnal Ilmu Kesehatan*, 1(3), 152–162. <https://doi.org/10.62383/quwell.v1i3.745>.
- Nisak, K., Kristinawati, B., & Widayati, N. (2019). Aplikasi *Massage Olive Oil* Untuk Mencegah Dekubitus Pada Pasien Kritis Di Ruang Intensive Care Unit Rumah Sakit Umum Pusat Dr. Soeradji Tirtonegoro Klaten. *The 10th University Research Colloquium, 2001*, 490–495.
- Nuzulullail, A. S., Pranata, S., Armiyati, Y., & Chanif. (2023). *Effleurage Massage* With *Virgin coconut oil* (Vco) To Prevent Decubitus Ulcers in Immobilized Patients: a Case Study. *Journal of Vocational Nursing*, 4(1), 21–26. <https://doi.org/10.20473/jovin.v4i1.44070>.
- Purnawaty, M., Astari, D. W., & Lestari, A. (2024). PENCEGAHAN PRESSURE ULCER DENGAN *MASSAGE EFFLEURAGE* DAN *VIRGIN COCONUT OIL* (VCO): STUDI KASUS. *Jurnal Persatuan Perawat Nasional Indonesia*, 9(3), 177. <https://doi.org/http://dx.doi.org/10.32419/jppni.v9i3.624>.
- Rahman, A. H., Jarrar, M., & Don, M. S. (2015). Nurse Level of Education, Quality of Care and Patient Safety in the Medical and Surgical Wards in Malaysian Private Hospitals: A Cross-sectional Study. *Global Journal of Health Science*, 7(6), 331–337. <https://doi.org/10.5539/gjhs.v7n6p331>.
- Retno, R. S., Pujiati, P., & Utami, S. (2016). Pelatihan Pembuatan *Virgin coconut oil* (VCO) Secara Fermentasi Di Desa Belotan, Bendo, Magetan. *Jurnal Terapan Abdimas*, 1, 35. <https://doi.org/10.25273/jta.v1i1.340>.

- Rodrigues, L. M., Rocha, C., Ferreira, H. T., & Silva, H. N. (2020). Lower limb *massage* in humans increases local perfusion and impacts systemic hemodynamics. *Journal of Applied Physiology*, 128(5), 1217–1226. <https://doi.org/10.1152/jappphysiol.00437.2019>.
- Saputro, Y., Pramudyo, C. S., & Jupriyanto, J. (2022). ANALISIS 5M (MAN, MATERIAL, MACHINE, MONEY & METHODE) DALAM PENGEMBANGAN TEKNOLOGI PERTAHANAN DI INDONESIA (STUDI KASUS: PT LEN INDUSTRI). *PROSIDING SNAST*. <https://doi.org/10.34151/prosidingsnast.v8i1.4139>.
- Sari, D. N., Husain, F., & Widodo, P. (2023). *Massage Efflurage VCO Terhadap Pencegahan Dekubitus pada Pasien Tirah Baring di RSUD Pandan Arang Boyolali*. *Sehat Rakyat: Jurnal Kesehatan Masyarakat*, 2(3), 410–416. <https://doi.org/10.54259/sehatrakyat.v2i3.1965>.
- Sari, S. P., Everink, I. H. J., Lohrmann, C., Amir, Y., Sari, E. A., Halfens, R. J. G., & Schols, J. M. G. A. (2025). Knowledge, attitude and practice of family caregivers on pressure injury prevention for community-dwelling older adults: a cross-sectional study in an Indonesia City. *BMC Nursing*, 24(1), 24. <https://doi.org/10.1186/s12912-024-02662-w>.
- Sharma, S. K., & Rani, R. (2020). Nurse-to-patient ratio and nurse staffing norms for hospitals in India: A critical analysis of national benchmarks. *Journal of family medicine and primary care*, 9(6), 2631–2637. <https://doi.org/10.4103/jfmjpc.jfmjpc 248 20>.
- Suryantini, N. P., & Ma rifah, A. (2022). *Effleurage Massage: Alternative Non-Pharmacological Therapy in Decreasing Dysmenorrhea Pain*. *Women, Midwives and Midwifery*, 2(3), 41-50. Retrieved from <https://wmmjournal.org/index.php/wmm/article/view/71>
- Zhao, Y., Xu, Y., Ma, D., Fang, S., Zhi, S., He, M., Zhu, X., Dong, Y., Song, D., Yiming, A., & Sun, J. (2024). The impact of education/training on nurses caring for patients with stroke: a scoping review. *BMC nursing*, 23(1), 90. <https://doi.org/10.1186/s12912-024-01754-x>.
- Zwoliński, T., Jaskulak, M., Janicki, K., Siek, B., Batycka-Stachnik, D., Wilczyński, B., Szalewska, D., Gworys, K., & Wąż, P. (2025). Clinicians' opinion on *massage* in the intensive care unit patients. *Frontiers in pain research (Lausanne, Switzerland)*, 6, 1452434. <https://doi.org/10.3389/fpain.2025.1452434>.