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## THE EFFECT OF SLOW STROKE BACK MASSAGE WITH SUNFLOWER OIL ON THE RISK OF DECUBITUS IN STROKE PATIENTS

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### ABSTRACT

Stroke is a neurological disorder characterized by total or partial body paralysis, commonly classified into hemorrhagic and non-hemorrhagic types. Among the 90% of acute stroke patients who experience neurological deficits, hemiparesis is one of the most frequent complications. This condition leads to prolonged immobility, increasing the risk of developing decubitus ulcers due to ischemia and hypoxia in subcutaneous tissues. Preventative measures are essential, especially in the form of early skin care interventions to maintain tissue integrity. This study aims to evaluate the effectiveness of slow stroke back massage (SSBM) using sunflower oil in preventing the risk of decubitus in stroke patients. The research employed a quasi-experimental design with pretest-posttest control groups. The intervention consisted of back massages using sunflower oil, known for its anti-inflammatory, antimicrobial, and moisturizing properties. The findings show that patients receiving the SSBM with sunflower oil had improved skin condition and reduced signs of tissue damage compared to the control group. This indicates the effectiveness of SSBM with sunflower oil in maintaining skin health and reducing the risk of pressure injuries. The study concludes that implementing simple, non-invasive interventions such as SSBM can significantly enhance the quality of care for stroke patients. These findings have implications for nursing practice, emphasizing the importance of integrating natural and cost-effective preventive care into standard stroke rehabilitation protocols.

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**KEYWORDS** *slow stroke back massage with sunflower oil, risk of decubitus, stroke*

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## INTRODUCTION

According to the World Health Organization, stroke is a clinical sign of focal or global brain function with symptoms lasting 24 hours or more that can lead to death, stemming from blockage of blood vessels (ischemic) or rupture of blood vessels. Stroke is total or partial paralysis of the body accompanied by cerebrovascular disorders, which refers to abnormalities of the central nervous system resulting from a lack of blood supply that carries oxygen to the brain, experiencing obstruction or rupture of blood vessels resulting in functional disorders. Focal signs and clinical symptoms over time will continue for 24 hours or more, resulting in focal and global neurological deficits, including impaired mobility and functional abilities, which can lead to new symptoms due to impaired mobility and prolonged bedside rest, i.e., decubitus wounds (Edsberg et al., 2016).

The Global Burden of Disease states that there is an increase in cases of 1 in 4 people at risk of stroke, and it is the number one cause of death in the world every year. Based on data from the World Stroke Organization in Southeast Asia, it shows that every year there are 11 million new cases of stroke and about 4 million deaths occur every year, about 30% experience severe disability and 70% of victims who recover are likely to experience recurrent strokes and often occur in developing countries. The prevalence of stroke in Indonesia reached 10.9 per mile, the highest in East Kalimantan Province (14.7 per mile), the lowest in Papua Province (4.1 per mile), while West Papua (6.4 per mile) cases (Schott et al., 2020).

The neurological deficits experienced by stroke patients are acute, which will directly cause various kinds of problems in long-term care. One of the problems that often arises is hemiparesis, namely paralysis, which can have the effect of being in bed for a very long time, which can cause pressure sores (decubitus). Most stroke patients experience paralysis, namely 90%, and this can cause impaired mobility in bed for quite a long time; This disruption in mobilization results in a mechanism of constant pressure for quite a long time from the outside (external pressure), especially in areas of protruding bones (Syahrim et al., 2019). This pressure has a higher strength than arterial intracapillary pressure and venous capillary pressure, so that it will damage the local blood flow of soft tissue. As a result, the tissue will experience ischemia and hypoxia. Pressure that persists for 2 hours or more will cause destruction and irreversible changes in the tissue, resulting in the formation of decubitus wounds. The occurrence of decubitus wounds can be prevented through skin care and early treatment by assessing the client's risk of developing decubitus wounds, minimizing pressure with bed sheets, improving the patient's general condition, and maintaining good skin care (Afika, 2023; Hasibuan, 2019; Yuniantina Rahmatia, 2020).

The incidence of decubitus is still a problem that continues to increase. Based on data from the Indonesian Ministry of Health (2018), the incidence of decubitus in Indonesia is 8.2 per 1000 population out of 273.52 million people. This figure has increased by 0.7% compared to the previous year, 2013 (Olson, 2012). A preliminary study conducted at 2 hospitals in the Sorong area of West Papua found that the number of stroke patients was 78 cases. During the last 3 months and 17 stroke patients with decubitus where the patients were repeat patients who had

previously undergone outpatient therapy, patients with decubitus wounds were still found. Due to the lack of prevention in providing intervention, nurses only change positions without any basis for how long it takes (Agnia & Kartilah, 2024; Arifa & Yunanto, 2025; Rahmadani & Chayati, 2023; Rahmawati et al., 2024). Lying for an extended period on a bed (bedrest) increases the risk of complications such as pulmonary edema, muscle stiffness, constipation, atelectasis, back pain, and decubitus. Decubitus can occur due to bacterial infection (Mona et al., 2022; Syamsuddin et al., 2022).

Bacterial infection is a complication of decubitus wounds, which can cause a risk of death of more than 50% from incidents in the hospital. Bacterial infections can also increase the length of treatment and the significant costs that must be incurred due to wounds, so it is necessary to develop knowledge to prevent the risk of pressure sores (decubitus). Decubitus wounds can be prevented with simple actions to reduce the incidence of decubitus, namely grade one decubitus. One intervention that is easy to implement to maintain and nourish moisture and circulation in areas at risk of decubitus is by using the massage method (Liao et al., 2019).

The high linoleic content, vitamins E, A, C, and D contained in sunflower oil, will better penetrate the skin with massage techniques. Slow stroke back massage is a massage technique recommended for stroke sufferers. Apart from providing a relaxing effect, it also affects hemodynamic status by responding to endorphins, delivering oxygen-rich blood to the back area, so that it can be more effective in preventing grade one pressure sores (Knight-Greenfield et al., 2019; Parmar, 2018).

Sunflower (*Helianthus annuus* L.) contains active ingredients including flavonoids, alkaloids, and tannins. The chemical, antimicrobial, and antioxidant composition of sunflower oil's activity of 6.4 mg/dl against *E. coli* and *Candida albicans* was tested using the minimum inhibitory concentration (MIC) method of SEO, which showed high antibacterial results and antifungal activity. In summary, the results of this study show the possibility for the development and application of sunflower oil as a potential natural medicinal ingredient due to its excellent antimicrobial properties and antioxidant activity to prevent bacteria that cause decubitus wounds.

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Decubitus (pressure sores) or decubitus ulcers are common in bed rest patients with a high incidence rate. According to one of the nurses in Sorong, the incidence of decubitus increased in patients in the room care. This often happens with low basic preventive care; nurses focus more on wound care because prevention is low, and decubitus wounds usually appear in the room. Proper decubitus prevention is essential in providing nursing services in the room to prevent decubitus wounds. Massage with sunflower oil can maintain healthy skin with the oil's anti-inflammatory, antimicrobial, and moisture-preserving effects. It

can be a basic choice for the risk of decubitus. So, based on this background, this research aims to determine the effect of giving a slow stroke back massage with sunflower oil on prevention. Risk of decubitus in stroke patients.

Previous studies have shown that decubitus is a common complication in stroke patients due to long-term immobilization, and non-pharmacological interventions such as massage have proven effective in improving blood circulation and maintaining skin integrity (Apriani & Susilo, 2020; Suryani et al., 2022). In addition, the use of natural oils such as virgin coconut oil and olive oil has been clinically tested in improving skin moisture and preventing pressure sores (Handayani et al., 2011; Janitra & Wibawa, 2019; Kusuma & Agustian, 2023; Nugroho & Rusmariana, 2024). However, empirical studies that specifically combine the Slow Stroke Back Massage (SSBM) technique with sunflower oil as a decubitus prevention strategy in stroke patients are still very limited. Therefore, this study offers novelty by exploring the potential of combined SSBM and sunflower oil therapy as a simple, natural, cost-effective intervention in nursing practice. This study aims to evaluate the effectiveness of slow stroke back massage (SSBM) using sunflower oil in preventing the risk of decubitus in stroke patients.

## RESEARCH METHOD

This study employed an experimental research design using the Pretest-Posttest Control Group Design approach. The research aimed to determine the effectiveness of slow stroke back massage (SSBM) with sunflower oil in preventing the risk of decubitus in stroke patients. The target population included all stroke patients who were in bed rest care at a designated healthcare facility. The sample consisted of 36 respondents, divided equally into two groups: 18 individuals in the control group who received standard care and 18 individuals in the intervention group who received SSBM with sunflower oil. A simple random sampling technique was applied to select participants who met the inclusion criteria, which included being diagnosed with stroke, being bedridden, and not having open wounds or allergies to oil-based products.

The instrument used in this study was an observation checklist based on the Braden Scale, which assesses the risk level for developing pressure ulcers. This checklist was tested for content validity by three clinical nursing experts, and reliability testing was conducted through inter-rater agreement with a Cohen's Kappa score  $>0.75$ , indicating high reliability. The intervention was performed once daily for 5 consecutive days, and data were collected both before and after the intervention using the same instrument to ensure consistency. The control group was monitored under the same observational conditions without receiving massage treatment. Researchers maintained ethical procedures by obtaining informed consent and approval from the ethics committee.

For data analysis, the collected data were processed using SPSS version 25.0. The Wilcoxon Signed-Rank Test was applied to examine pretest and posttest differences within the intervention and control groups, while the Mann-Whitney U Test was used to compare posttest results between both groups due to non-normal data distribution. These non-parametric tests allowed for the accurate evaluation of

the intervention's effectiveness in reducing the risk of pressure ulcers. The findings were then interpreted in the context of clinical relevance, ensuring that recommendations could be applied in practical nursing interventions for stroke patient care.

## RESULT AND DISCUSSION

### General Overview of the Research

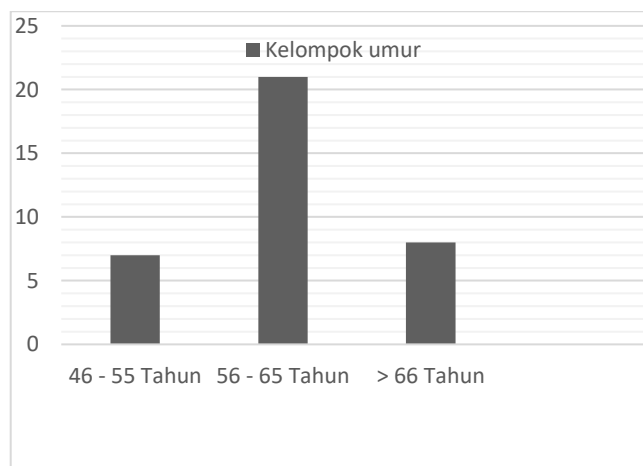
This study was conducted in two different hospitals in cities and districts in Southwest Papua. These are referral hospitals categorized as Type C, serving Papua, West Papua, and the surrounding areas. The prevalence of non-communicable diseases in West Papua Province is 28.8%, higher than the national figure of 14.0%. Based on healthcare professionals' diagnoses, the prevalence of stroke among men is higher than among women.

Data collection occurred from November to December 2023, at two hospitals in different cities and districts. Based on inclusion and exclusion criteria, and using random sampling within the specified time frame, 36 respondents were selected, all of whom had suffered from stroke and were at risk of developing decubitus. The respondents were divided into an intervention group and a control group, each consisting of 18 respondents.

### Univariate Analysis

#### *Characteristics of Respondents:*

The study involved 36 respondents, divided into two groups: 18 in the control group and 18 in the intervention group, which received slow stroke back massage (SSBM) with sunflower oil. The characteristics of the respondents included age and gender, with a history of stroke and a risk of developing decubitus.



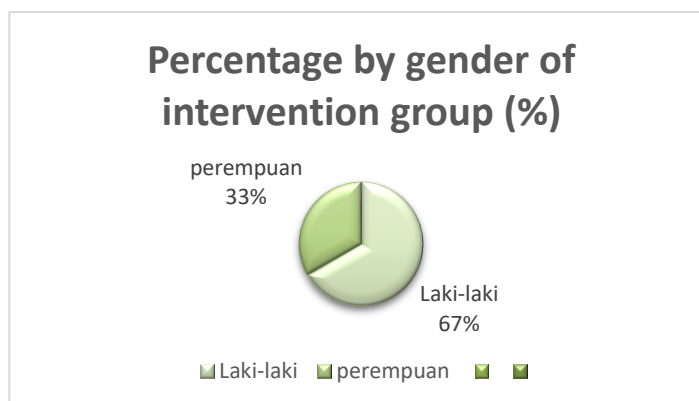
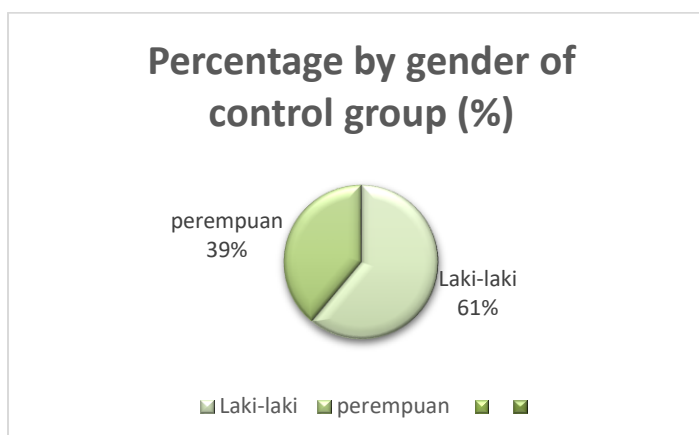
**Figure 1. Age Group Distribution in the Study Sample**

Figure 1 shows that the age group of 56-65 years dominated the number of stroke patients, with the fewest in the 46-55 years group.

**Table 1. Respondent Distribution by Age**

Variable	Intervention			Control		
	mean	SD	Min-Max	mean	SD	Min-Max
Age	61.1	9.05	48-83	61.1	8.51	47-82

Table 1 shows the respondents' age characteristics: The dominant average age in both groups is 61, with the youngest patient being 47 and the oldest 83.

**Figure 2. Percentage Distribution by Gender in the Intervention Group****Figure 3. Percentage Distribution by Gender in the Control Group****Table 2. Respondent Distribution by Gender**

Gender	Intervention		Control	
	n	%	N	%
Male	12	66.7	11	61.1
Female	6	33.3	7	38.9

Based on Table 2, the majority of samples in both groups are dominated by males compared to females. In the control group, 11 (61.1%) were male, and 7 (38.9%) were female. Similarly, 12 respondents (66.7%) were male in the intervention group, and 6 (33.3%) were female.

#### **Bivariate Analysis**

**Table 3. Normality Test Results for Each Group**

Variable	Group	Kolmogorov-smirnov ( $p > 0.05$ )		
		K-S Z	df	p-value
Pretest	Control	0.196	18	0.065
	Intervention	0.241	18	0.007
Posttest	Control	0.213	18	0.03
	Intervention	0.228	18	0.014

Table 3 above shows the normality test results, indicating that the variables are not normally distributed ( $p < 0.05$ ), except for the control group in the pretest ( $p > 0.05$ ). Therefore, further testing was carried out using non-parametric tests (Mann-Whitney and Wilcoxon tests).

**Table 4. Degree of Pressure Ulcer Risk Before and After Slow Stroke Back Massage with Sunflower Oil (Intervention Group)**

Variable	N	Mean	SD	P value
Pressure Ulcer Degree (Pretest)	18	11.9444	-3.716	0.000
Pressure Ulcer Degree (Posttest)	18	13.8889		

Based on Table 4, the intervention group's average degree of pressure ulcer risk before and after the intervention using slow stroke back massage with sunflower oil showed a significant result ( $p < 0.05$ ). There was a significant difference after the intervention, with the average post-test value (13.8889) higher than the pre-test value (11.9444).

**Table 5. Degree of Pressure Ulcer Risk Before and After Treatment Without Massage with Oil (Control Group)**

Variable	N	Mean	SD	P value
Pressure Ulcer Degree (Pretest)	18	11.7222	-0.277	0.782
Pressure Ulcer Degree (Posttest)	18	11.7778		

From Table 5 above, it can be seen that the significant value ( $p > 0.05$ ) is identical (not significantly different) after the standard treatment in the control group. The average degree of pressure ulcer risk in the control group before and after the standard treatment in the hospital did not show any significant difference, with the post-test average being 11.7778 and the pre-test average being 11.7222.

**Table 6. Comparison of Average Degree of Pressure Ulcer Risk Between Intervention and Control Groups**

Variable	N	Mean	SD	p-value
Intervention Group	18	13.8889	-4.334	0.000
Control Group	18	11.7778		



From Table 6 above, the probability value (Sig.) is 0.000, indicating significance ( $p < 0.05$ ). This shows that the post-test averages of the control and intervention groups are not identical (significantly different). The average post-test score in the intervention group (13.8889) was significantly higher than in the control group (11.7778).

### **Effect Size of the Intervention of Slow Stroke Back Massage with Sunflower Oil on Preventing Pressure Ulcer Risk in Stroke Patients**

The calculated effect size from both groups shows a high impact after the intervention of slow stroke back massage with sunflower oil on the risk of decubitus in stroke patients, with the effect size value as follows:

**Table 7. Effect Size on Preventing Pressure Ulcer Risk in Stroke Patients**

<b>Variable</b>	<b>N</b>	<b>Mean<math>\pm</math>SD</b>	<b><i>Cohen's D effect Size</i></b>
Intervention	18	13.8889 $\pm$ 3.716	0.801
Control	18	11.7778 $\pm$ 0.277	

Table 7 shows that the Cohen's D effect size for the Mann-Whitney test on total pressure ulcer risk is 0.801, which is categorized as high. This effect size result was obtained by calculating the Mean  $\pm$  SD of the intervention and control groups and the sample size of each group using the formula. The intervention group, which received slow stroke back massage with sunflower oil, showed a significant impact in reducing the risk of decubitus in stroke patients..

### **Discussion**

Stroke is total or partial paralysis of the body which is divided based on causes, namely hemorrhagic and non-hemorrhagic strokes accompanied by cerebrovascular disorders that focus on disorders of the central nervous system due to the lack of oxygen carried by the blood, inhibited due to rupture of blood vessels and there is an obstruction of blood rate due to functional disorders of the body. Focal and global neurological deficits that are disturbed for more than 24 hours can cause new symptoms, impaired mobility, and lying down for a long time, increasing the risk of decubitus wounds and increasing treatment costs due to the injury. Decubitus wounds are a common phenomenon that is often encountered in bedridden patients due to repeated strokes admitted to the hospital; this occurs due to low basic care, where treatment focuses more on treating decubitus wounds than on preventing the risk of decubitus, resulting in costs incurred that are greater than prevention.

Slow stroke back massage is a type of massage aimed at stroke patients with a mechanism that stimulates the circulatory circulation because it activates mechanoreceptors to release endocrine, providing a relaxing effect that delivers the nutrients needed by the tissues through the blood circulation to the area to be massaged, done for 4-5 minutes 2 times a day after bathing. The use of Sunflower oil when doing massage is an effective combination in tissue repair so that the risk of decubitus is reduced because the content of active substances vitamins E and C in sunflower oil has benefits as antioxidants, analgesics, anti-inflammatory and



antimicrobials so that there is a decrease in the risk of decubitus which can be distinguished by looking at the results of the Braden scale as a reference for decubitus risk assessment.

The study's results on the degree of decubitus risk in the intervention group that was given slow stroke back massage treatment with sunflower oil showed a significant average difference of  $p=0.000$ . Before and after the treatment, the slow stroke back massage with sunflower oil reduced the risk of decubitus. The results of the research of the control group that was treated without massage or oil had an average difference value with a value of  $p = 0.782$ , meaning that there was not much difference before and after the treatment.

The bivariate analysis conducted in this study, the Mann-Whitney test, showed a significant difference of  $p=0.000$  between the average risk of decubitus in the intervention group and the control group. This means that the group that was given a slow stroke back massage treatment with sunflower oil was more effective in reducing the risk of decubitus in stroke patients.

The results of Cohen's D effect Size calculation for the Mann-Whitney Test on the total risk of decubitus are 0.801, which means that the intervention group greatly influences reducing the risk of decubitus in stroke patients. This study's results align with Novitasari et al. (2018). The statistical test results obtained a  $p=0.001$  effect of back massage on the incidence of decubitus prevention.

A comparison of previous studies has similarities with the research of Novitasari et al. (2018) on the effect of back massage on reducing the incidence of decubitus risk prevention, with a value of  $p=0.001$ . Ivana et al. (2017) showed that back massage influenced indicators of decubitus incidence, including skin color, consistency of the cuticle, and temperature in the patient's back area. With each  $p<0.05$ , there was a significant difference in each indicator.

Massage helps prevent pressure sores that promote hyperemia (increased blood supply locally). The release of histamine increases tissue flexibility, relaxes muscle tone, increases parasympathetic activity, reduces edema, eliminates subcutaneous scarring, and results in mast cells. However, massage with sliding force on vulnerable skin may provide a new effect.

The mechanism of action of slow stroke back massage with sunflower oil, which contains vitamins E and C, active substances, can have antioxidant, analgesic, anti-inflammatory, and antimicrobial activities. The application of slow stroke back massage with sunflower oil on the skin can cause a vasodilating effect or widening of blood vessels and a relaxing effect that delivers the nutrients needed by the skin that are carried by blood in the area where the massage is performed. Inflammation decreases, and the risk of decubitus wounds also decreases.

Nursing implications based on the results of the intervention in each group that provided standard care activities for pressure wound prevention (changing positions every 2 hours and bathing 2 times a day) with slow stroke back massage using sunflower 5 ml for 4-5 minutes 2 times a day after bathing stroke patients for 4 days. Able to reduce the risk of decubitus because Slow stroke back massage is a massage that stimulates the parasympathetic nervous system, improves circulation, provides a relaxing effect to provide more nutrients to the skin to be more effective in reducing inflammation at risk of decubitus, sunflower oil is an essential oil that

contains vitamins E and C, active substances that have antioxidant, analgetic, anti-inflammatory and antimicrobial activities.

Nurses can make a slow stroke back massage intervention with sunflower oil as one of the complementary therapies for stroke patients. The Standard Operating Procedure (SOP) for slow stroke back massage with sunflower oil has been prepared with instructions to make it easier to implement.

In this study, it was found that there were shortcomings and limitations by the researcher that caused this research to be less than perfect, including:

1. Researchers cannot control other factors that can affect the risk of decubitus, such as food portions, urinary incontinence, decreased mental status, decreased sensation, and excessive body heat, researchers only assess the time before the action is carried out and after the action is carried out
2. The researcher was quite quick to find and meet the samples in the research variable because it is a rare case, so the researcher conducted research in two hospitals within the scope of the study, which met the research sample
3. The researchers did not examine patients' risk of decubitus caused by diseases other than stroke, which may increase decubitus risk.

## CONCLUSION

Based on the findings of this study, it can be concluded that the intervention of slow stroke back massage (SSBM) with sunflower oil significantly reduced the risk level of decubitus in stroke patients on prolonged bed rest. Patients who received the SSBM treatment experienced a greater improvement in skin integrity and a more noticeable reduction in decubitus risk compared to those who did not receive the massage. In contrast, the group without oil massage showed minimal difference in risk levels, emphasizing the added benefit of sunflower oil's moisturizing, anti-inflammatory, and antimicrobial properties. These results suggest SSBM with sunflower oil is an effective, low-cost, and non-invasive nursing intervention for preventing pressure ulcers in immobilized patients.

For future research, it is recommended to conduct longitudinal studies with a larger and more diverse sample size and to examine the long-term effects of this intervention across various clinical settings. Additionally, future studies could further explore sunflower oil's biochemical properties and compare its efficacy with other natural oils in preventing skin breakdown. Integrating such complementary interventions into standard stroke care protocols may significantly improve patient outcomes and reduce the incidence of decubitus in healthcare facilities.

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