Mobilization and Massage as a Prevention Against Pressure Ulcers: Quasi-Experimental Study

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ABSTRACT

Bed rest is a condition in which a patient is unable to move and must lie down for about 24 hours. One negative physical impact is damage to skin integrity, commonly known as pressure sores or decubitus ulcers. Efforts to address this problem include mobilization and massage therapy. Mobilization involves changing the patient's position at specific intervals as part of nursing intervention, while massage improves blood circulation. These actions can prevent pressure ulcers. Research was conducted to determine the effect of mobilization and massage on the risk of pressure ulcers in bedridden patients at Dustira Hospital in Cimahi, Indonesia. This research design is a quasi-experiment with a nonequivalent control group. The population consists of all bedridden patients, and the total sample is 62 people. There are 31 patients in the intervention group and 31 patients in the control group. Purposive sampling was used for the sample selection. Pressure ulcer risk was assessed using the Braden scale. After testing the normality of the data using the Shapiro-Wilk test ($p < 0.005$), the results were analyzed using nonparametric tests namely the Wilcoxon and Mann-Whitney tests. After treatment, the mean score was 40.97 in the intervention group and 22.03 in the control group. The results showed a significant difference in pressure ulcer risk between the two groups after the intervention (p-value = 0.000). This study emphasizes the importance of incorporating pressure ulcer prevention for bedridden or immobilized patients into routine care in regular wards, intensive care units, and other settings where patients are bedridden for extended periods. This approach supports continuous care by addressing the physical and mental needs of patients. Additionally, the findings of this study will serve as the basis for evidence-based interventions to improve the quality of nursing services in hospitals. Furthermore, collaboration among healthcare teams, including doctors, nurses, nutritionists, and others, is essential to optimize care for bedridden patients, regardless of their underlying conditions.

Keywords: Pressure Ulcers, Mobilization, Massage, Bed Rest

Introduction

Patients who are bedridden require skin identification and assessment upon admission to hospital and throughout their treatment. This helps to determine the preventive measures needed to minimise the incidence of pressure sores. Prolonged immobility or bed rest can have negative physical effects, such as damage to the integrity of the skin, commonly known as pressure sores or decubitus. Risk factors that can contribute to pressure ulcer development in intensive care patients include immobility, friction or sliding in bed, excessive sweating, wound drainage and urinary or fecal incontinence (Agustina, 2023). The incidence of pressure ulcers

varies considerably between settings. Rates range from 0.4–38% in acute care units, 2.2–23.9% in long-term care units and 0–7% in home care (National Pressure Ulcer Advisory Panel, 2020).

Immobilisation puts pressure mainly on areas where bones protrude. This pressure leads to ischaemia and hypoxaemia in the affected tissue because blood flow to the area is reduced. Pressure sores lead to increased skin maceration (softening due to wetness), causing the epidermis to erode more easily and inhibiting blood flow. Impaired blood flow hinders the supply of oxygen and nutrients to the tissues, which can lead to necrosis of the skin tissue. If left untreated, necrosis of the skin tissue will gradually spread to the muscle and bone tissue. Once necrosis has occurred in the muscles and bones, it can also spread gradually to the tendons and joints (Kozier, 2016).

The most effective way to address this issue is to combine mobilisation and massage therapy. Mobilisation is a standard nursing intervention procedure performed to reduce the risk of pressure ulcers in immobilised patients. Position changes involve tilting the patient from supine to lateral, or vice versa. Patients with hemiplegia or in a coma should have their position changed every two hours, first to the right and then to the left (Potter & Perry, 2020). Meanwhile, effleurage massage improves blood circulation and aids the metabolic process. It assists in the absorption of oedema caused by inflammation and reduces pain and tension (Heather & Herdman, 2022). In this study, effleurage massage used virgin coconut oil (VCO), which contains antioxidants and vitamin E (Santiko, 2020).

Materials and Methods

Study design

The research design was a quasi-experiment with a nonequivalent control group, using two groups of subjects (an intervention group and a control group). Respondents were included if they were hospitalized for three days based on a doctor's advice to remain in bed and were cooperative.

Participants and setting

This study used a non-probability sampling technique, specifically purposive sampling. A total of 62 respondents were sampled and divided into intervention and control groups. The intervention group received mobilisation and effleurage massage, while the control group received mobilisation only. The respondents were obtained from the Teratai inpatient ward at Dustita Hospital. The mobilisation intervention was carried out in accordance with the available ward SOP, while the effleurage massage therapy was carried out for three consecutive

days, twice daily for 10–15 minutes in the morning and afternoon. The study was conducted from March to August 2024.

Ethical considerations

This research was approved by the Ethics Committee in Dustira Hospital with number registration: Etik.RSD/135/VIII/2024.

Variable and Data Collection

The independent variables in this study were mobilisation and effleurage massage, while the dependent variable was the risk of pressure sores. Measurement was carried out using the Braden Scale, which classifies scores as follows: < 9 very high risk (VHR); 10-12 high risk (HR); 13-14 moderate risk (MR); 15-18 low risk (LR) (Braden & Bergstrom in Patricia, 2017). The researcher was assisted by three enumerators, namely nurses working in the Teratai ward of Dustira Hospital.

Data Analysis

The data analysis in this study was both univariate and bivariate. Univariate analysis used frequency distribution. For the bivariate analysis, the researcher first tested the normality of the data using the Shapiro–Wilk test. The results showed that the data were not normally distributed, with $p<0.05$. Therefore, the Mann-Whitney non-parametric test was used to examine the effectiveness of mobilization and encouragement massage interventions.

Results and Discussion

As shown in the table below, 12 respondents (38.7%) were at moderate risk of pressure sores before the intervention, compared to 26 respondents (83.9%) after the intervention.

Table 1. Risk of Injury in Bedridden Patients Before and After Mobilisation and Effleurage Massage Treatment in The Intervention Group.

Variables	Pretest		Posttest	
	f	%	f	%
VHR	2	6.5	0	0
HR	10	32.3	1	3.2
MR	12	38.7	4	12.9
LR	7	22.6	26	83.9
Total	31	100	31	100

Based on the table below, before the intervention, 5 respondents (16.1%) were at low risk. Following the intervention, this figure increased to 11 respondents (35.5%).

Table 2. Risk of Injury in Bedridden Patients Before and After Mobilisation Treatment in The Control Group.

Variabel	Pretest		Posttest	
	f	%	f	%
VHR	1	3.2	0	0
HR	10	32.3	4	12.9
MR	15	48.4	16	51.6
LR	5	16.1	11	35.5
Total	31	100	31	100

Table 3. The Effectiveness of Mobilisation and Effleurage Massage on Pressure Ulcer Risk.

Variables	n	Mean Rank	p-Value
Intervention	31	40.97	0,000
Control	31	22.03	

As can be seen from the above table, there is a difference in the average pressure ulcer risk level (mean rank) after treatment between the intervention group (40.97) and the control group (22.03), with a p-value of $0.000 < \alpha$ (0.05). Therefore, it can be concluded that the two groups differ in terms of pressure ulcer risk.

Before the intervention, 12 respondents (38.7%) in the intervention group were categorised as being at moderate risk of pressure ulcers. Following the intervention, which consisted of a combination of mobilisation and effleurage massage, the number of patients at low risk increased significantly, with 26 respondents (83.9%) falling into this category.

These findings suggest that a combination of interventions can reduce the risk of pressure ulcers. This is consistent with the theory proposed by Braden and Bergstrom (1987) that improving blood circulation and reducing pressure on specific areas are key to preventing pressure ulcers. Effleurage massage, a light massage technique, can increase blood flow, improve tissue oxygenation and reduce muscle stiffness caused by immobilisation. Routine mobilisation has also been shown to reduce prolonged pressure on vulnerable areas, such as the sacrum, heels and scapula.

Before the intervention was carried out, 5 respondents (16.1%) in the control group were in the low-risk category. After receiving the mobilisation intervention alone, this figure

rose to 11 respondents (35.5%). However, this increase was not comparable to the changes that occurred in the intervention group.

This suggests that, while mobilisation can play a role in reducing the risk of pressure ulcers when used as the sole intervention, its impact is relatively limited. Routine mobilisation reduces pressure on certain areas of the body and improves blood circulation. However, without additional supportive care, such as effleurage massage, the therapeutic effects of mobilisation may not be optimal, particularly for patients at moderate to high risk. This study confirms the findings of research by the Wound, Ostomy and Continence Nurses Society (2021), which states that mobilisation must be combined with other interventions to more effectively prevent pressure ulcers.

Statistical tests on the effectiveness of mobilization and effleurage massage interventions revealed a significant difference between the intervention and control groups. The mean pressure ulcer risk score after the intervention was 40.97 in the intervention group and 22.03 in the control group. The p-value was $0.000 < \alpha$ (0.05), indicating a statistically significant difference between the two groups.

These results suggest that combining mobilisation with effleurage massage is more effective than mobilisation alone at preventing pressure sores. The combined mechanical and physiological effects of these two interventions work to maintain skin integrity, improve peripheral circulation and increase the comfort of bedridden patients.

According to tissue homeostasis theory, an adequate supply of oxygen and nutrients to skin tissue is crucial in preventing local ischaemia, which can lead to necrosis and pressure sore formation. Therefore, interventions such as effleurage massage, which increases tissue perfusion, can form part of a comprehensive pressure sore prevention approach.

These findings have significant implications for nursing practice, particularly when caring for bedridden patients. A combination of mobilisation and effleurage massage can be incorporated into pressure ulcer prevention programs on inpatient wards. Nurses are expected to perform these interventions on a scheduled basis and receive appropriate technical training to maximize the benefits of the therapy.

The study only examined the effects of early mobilisation and effleurage massage on the risk of pressure sores. It did not analyse other potential influencing factors, such as age, nutrition, obesity and family support, in depth.

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