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THE EFFECT OF GIVING ALOE VERA IN PREVENTION OF DECUBITUS IN PATIENTS IN THE ICU

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ABSTRACT

Background: Pressure ulcers (decubitus) are an example of chronic wounds, where the cost of treatment is relatively high. The use of plants offers an appropriate alternative approach for treating chronic wounds such as decubitus. Among various medicinal plants known for their health benefits is aloe vera (Aloe vera). With its numerous components, aloe vera is known to influence the healing of chronic decubitus wounds. The aloe vera plant has anti-inflammatory and immunostimulant effects that play a role in aiding the wound healing process. Objective: This study aims to determine the effect of aloe vera on the prevention of decubitus. Method: This research employed a pre-experimental design with a One Group Pre-Post Test Design approach. The study sample consisted of 30 patients who had been bedridden for an extended period. Results: The non-parametric statistical test (Wilcoxon) showed a p-value of 0.000 (p-value 0.000 < 0.05), indicating a significant effect of aloe vera administration in preventing decubitus. Conclusion: Aloe vera is known to influence the healing of chronic decubitus wounds. The aloe vera plant has anti-inflammatory and immunostimulant effects that play a role in aiding the wound healing process.
Keywords: aloe vera, decubitus, ICU

Introduction

Patients receiving care in ICU settings are at high risk of developing pressure ulcers (decubitus) due to prolonged bed rest, limited mobility, and declining consciousness. Bed rest is a condition where patients cannot move actively and remain lying down for approximately 24 hours a day due to physical or mental organ dysfunction. Bedridden patients experience numerous negative impacts, including neuromuscular dysfunction, thromboembolism, atelectasis, pressure ulcers, and impaired limb function.

Pressure ulcers, or decubitus, are the most common condition among individuals with prolonged immobility. They occur due to a lack of skin monitoring and care in pressure-prone areas, leading to impaired skin integrity. Decubitus is caused by prolonged pressure, resulting in tissue damage or necrosis from compromised blood circulation in localized areas. Vulnerable body areas include the back, sacrum, ischium, and heels. One critical aspect of nursing care for stroke patients is maintaining skin integrity, which can be achieved through planned and consistent skin care.

Unplanned or inconsistent skin care can lead to skin integrity issues, such as irritation or pressure injuries, further exacerbating the development of pressure ulcers.

Pressure ulcers are localized damage to the skin or underlying tissue, often occurring over bony prominences. Decubitus ulcers result from prolonged pressure that increases capillary stress, leading to necrosis. In Europe, the prevalence of decubitus ulcers ranges from 8% to 54% in ICU settings, while in long-term care facilities, prevalence is reported at 24% in the US ICU care significantly increases the risk, with incidences reaching 33% and prevalence at 41%. Prevalence rates have been reported at 12.7% in Brazil, 10.4% in Turkey, and 47.6% in Thailand. Globally, decubitus ulcers are a leading cause of morbidity and mortality in healthcare settings, with prevalence rates in Indonesia ranging from 15.8% to 35%.

Pressure ulcers are chronic wounds with high treatment costs. Using plants provides an alternative method for treating chronic wounds such as decubitus. One well-known medicinal plant is aloe vera (Aloe vera). With its various components, aloe vera can influence chronic wound healing. It has anti-inflammatory and immunostimulant effects that aid in the healing process. Aloe vera contains compounds such as alkaloids, flavonoids, glycosides, saponins, and tannins. Its leaves are rich in vitamins, enzymes, proteins, carbohydrates, minerals (calcium, sodium, magnesium, zinc, iron), and amino acids, which act as anti-inflammatory agents.

Aloe vera has been used for skin problems since 1500 BC and is one of 360 aloe species. The glucomannan in aloe vera, rich in mannose polysaccharides, promotes fibroblast proliferation and increases hyaluronic acid and hydroxyproline production, accelerating wound healing. Additionally, mucopolysaccharides, amino acids, and zinc in aloe vera maintain skin integrity and prevent skin ulcers.

Based on medical records and interviews with the ICU head at Siti Fatimah Regional Hospital, South Sumatra Province, conducted on February 28, 2024, data revealed that 595 patients were treated in the ICU in 2023. In January 2024, 57 patients were admitted, with two experiencing decubitus.

Pressure ulcers can develop within a short period (2–4 hours) and are often challenging to treat. Patients with decubitus tend to have extended hospital stays of approximately 4.31 days and incur higher treatment costs. Maintaining and improving skin integrity is crucial for patient well-being, especially in vulnerable groups in ICU settings. Keeping the skin healthy and intact is key to preventing inflammation, microbial infections, lesions, and wounds.

Planned and consistent skin care is essential for patients at risk of decubitus to maintain skin integrity and minimize damage. One effective approach is the routine application of aloe vera gel. Research by Walash et al. (2019) demonstrated faster healing, reduced pain, and shorter hospital stays in patients treated with aloe vera gel compared to a control group. Essa et al. (2020) reported significant pain reduction and improved wound healing within three days of aloe vera ointment application on surgical wounds, especially in diabetic patients. Aloe vera has been shown to reduce wound size, promote epithelialization, and enhance granulation tissue formation.

Given the importance of preventing pressure ulcers, particularly in ICUs, this study explores the use of aloe vera for immobilizing patients vulnerable to decubitus as a preventative measure. At Siti Fatimah Regional Hospital, non-pharmacological treatments, such as olive oil, are commonly used, but aloe vera application has not yet been implemented.

Method

This study utilized a pre-experimental design with a One Group Pre-Post Test Design approach. It was conducted in the ICU of Siti Fatimah Regional General Hospital, South Sumatra Province, in 2024. The research was carried out over approximately one month, from April 11 to May 11, 2024. The study population consisted of all ICU patients at Siti Fatimah Regional General Hospital in 2024, with a total of 30 patients.

At the initial stage, field observations were conducted in the ICU to determine the sample using total sampling. The sample criteria were divided into inclusion and exclusion criteria. The inclusion criteria included ICU patients with prolonged bed rest, immobilized patients, patients with declining consciousness, and adult patients aged 18 years and above. The exclusion criteria included families unwilling to participate as respondents, patients who passed away suddenly before the study was completed within 7 days, and patients allergic to aloe vera.

Selected respondents were first informed about the study's objectives and procedures. During the second stage (pre-test), measurements were taken using the Norton scale, followed by the application of aloe vera. In the third stage (post-test), the Norton scale was measured again.

This study employed the Norton Scale instrument, with total Norton Ratings (NR) for patients ranging from 20 (minimum risk) to 5 (maximum risk). Indicatively, a Norton Rating below 9 indicates very high risk, 10–13 indicates high risk, 14–17 indicates moderate risk, and above 18 indicates low risk.

Results

Table 1. Distribution and Frequency of Respondents' Age Levels Based on the Ministry of Health (Depkes RI)

No	Age Category	Frequency	Perpercent (%)
1	Early Adulthood	2	6.7
2	Late Adulthood	3	10
3	Early Elderly	11	36.7
4	Late Elderly	7	23.3
5	Advanced Elderly	7	23.3
	Total	30	100

Based on the results of the univariate analysis in table 1 for the age category of respondents, there were 2 people in early adulthood (6.7%), 3 people in late adulthood (10%), 11 people in early elderly (36.7%), 7 people in late elderly (23.3%) and 7 people in elderly (23.3%).

Table 2. Distribution and Frequency of Respondents' Gender

No	Gender	Frequency	Percentage (%)

1	Man	12	40
2	Woman	18	60
	Amount	30	100

Based on the results of the univariate analysis in table 2, for the category of male respondents, there were 12 people (40%) and female respondents were 18 people (60%).

Table 3. Distribution and Frequency of Respondents' Awareness Levels

No	Level of Consciousness	Frequency	Percentage (%)
1	Delirium	8	26.7
2	Somnolence	8	26.7
3	Sopor	7	23.3
4	Coma	7	23.3
	Amount	30	100

Based on the results of the univariate analysis in table 3 for the category of level of consciousness, respondents with delirium were 8 people (26.7%), somnolence was 8 people (26.7%), stupor was 7 people (23.3%) and coma was 7 people (23.3%).

Table 4. Distribution and Frequency of Decubitus Risk Levels of Respondents on the Norton Scale Pre-Test Day 1

No	Decubitus Risk Level	Frequency	Percentage (%)
1	Medium Risk	6	20
2	High Risk	10	33.3
3	Very High Risk	14	46.7
	Amount	30	100

Based on the results of the univariate analysis in table 4 for the category of risk level of decubitus Pre-test Day 1, respondents who had moderate risk were 6 people (20%), high risk were 10 people (33.3%) and very high risk were 14 people (46.7%).

Table 5. Distribution and Frequency of Decubitus Risk Levels of Respondents on the Norton Scale Post-Test Day 1

No	Decubitus Risk Level	Frequency	Percentage (%)
1	Medium Risk	6	20
2	High Risk	10	33.3
3	Very High Risk	14	46.7
	Amount	30	100

Based on the results of the univariate analysis in table 5 for the category of risk level of decubitus Post-test Day 1, respondents who had moderate risk were 6 people (20%), high risk were 10 people (33.3%) and very high risk were 14 people (46.7%).

Table 6. Distribution and Frequency of Decubitus Risk Levels of Respondents on the Norton Scale Pre-Test Day 4

No	Decubitus Risk Level	Frequency	Percentage (%)
1	Medium Risk	12	40
2	High Risk	4	13.3
3	Very High Risk	14	46.7
	Amount	30	100

Based on the results of the univariate analysis in table 6 for the category of risk level of decubitus Pre-test Day 4, respondents who had moderate risk respondents were 12 people (40%), high risk respondents were 4 people (13.3%) and very high risk respondents were 14 people (46.7%).

Table 7. Distribution and Frequency of Decubitus Risk Levels of Respondents on the Norton Scale Post-Test Day 4

No	Decubitus Risk Level	Frequency	Percentage (%)
1	Medium Risk	12	40
2	High Risk	4	13.3
3	Very High Risk	14	46.7
	Amount	30	100

Based on the results of the univariate analysis in table 7 for the category of risk level of decubitus Post-test Day 4, respondents who had moderate risk respondents were 12 people (40%), high risk respondents were 4 people (13.3%) and very high risk respondents were 14 people (46.7%).

Table 8. Distribution and Frequency of Decubitus Risk Levels of Respondents on the Norton Scale Pre-Test Day 7

No	Decubitus Risk Level	Frequency	Percentage (%)
1	Medium Risk	15	50
2	High Risk	1	3.3
3	Very High Risk	14	46.7
	Amount	30	100

Based on the results of the univariate analysis in table 8 for the category of decubitus risk level Pre-test Day 7, respondents who had moderate risk respondents were 15 people (50%), high risk respondents were 1 person (3.3%) and very high risk respondents were 14 people (46.7%).

Table 9. Distribution and Frequency of Decubitus Risk Levels of Respondents on the Norton Scale Post-Test Day 7

No	Decubitus Risk Level	Frequency	Percentage

			(%)
1	Medium Risk	15	50
2	High Risk	1	3.3
3	Very High Risk	14	46.7
	Amount	30	100

Based on the results of the univariate analysis in table 9 for the category of risk level of decubitus Post-test Day 7, respondents who had moderate risk respondents were 15 people (50%), high risk respondents were 1 person (3.3%) and very high risk respondents were 14 people (46.7%).

Before conducting bivariate analysis, a data normality test was first carried out using the Shapiro Wilk test because the sample was less than 50 respondents, with the provision that if the p value> 0.05 then the data is normally distributed and if the p value <0.05 means the data is not normally distributed.

Table 10. Results of the Shapiro-Wilk Normality Test

	Shapiro Wilk		
	Statistics	df	Sig
Pre-test day 1	.844	30	.000
Post-test day 1	.876	30	.002
Pre-test day 4	.830	30	.000
Post-test day 4	.806	30	.000
Pre-test day 7	.840	30	.000
Post-test day 7	.840	30	.000

Based on table 10, the results of the data normality test show that the Pre-test on day 1, 4.7 and Post-Test on day 4 and 7 with a p value = 0.000 Post-Test on day 1 with a p value = 0.002, which means that the data is not normally distributed, so for bivariate analysis using non-parametric, namely the Wilcoxon test where the significance limit α = 0.05 (95% Confidence Interval).

Table 11. Results of the Wilcoxon Non-parametric Test

Decubitus Degree	Median	Min-Max	Std. Deviation	P Value
Pre Test Day 1	11.00	5-14	3,579	0,000
Post Test Day 7	13.50	5-18	5,041	

Based on table 11, it can be seen that the significant value of the non-parametric statistical test results (Wilcoxon) is 0.000 (p value 0.000 < 0.05), which means that there is an effect of giving aloe vera gel in preventing decubitus.

Discussion

At the pre-test stage on day 1, measurements were taken using the Norton scale, then Aloe vera was given. At the post-test stage on day 1, the Norton scale was measured again, the pre-test on day 4 was measured using the Norton scale, then Aloe vera was given. At the post-test stage on day 4, the

Norton scale was measured again, the pre-test on day 7 was measured using the Norton scale, then Aloe vera was given. At the post-test stage on day 7, the Norton scale was measured again. processed and univariate and bivariate analysis was carried out using computerized statistical test data analysis techniques via SPSS.

The results of the univariate analysis in table 4 for the category of decubitus risk level Pre-test Day 1, respondents who have moderate risk are 6 people (20%), high risk are 10 people (33.3%) and very high risk are 14 people (46.7%). Based on the results of the univariate analysis in table 4.8 for the category of decubitus risk level Post-test Day 7, respondents who have moderate risk respondents are 15 people (50%), high risk is 1 person (3.3%) and very high risk is 14 people (46.7%).

Based on table 11, it can be seen that the significant value of the non-parametric statistical test results (Wilcoxon) is 0.000 (p value 0.000 < 0.05), which means that there is an effect of giving aloe vera in preventing decubitus.

Decubitus ulcers are divided into four degrees, degree 1, namely there are changes in the skin that can be observed, only covering the outermost layer of skin, the skin is still intact, the wound looks reddish with white skin color or darker in people with dark skin, the affected skin can feel more painful, soft, hot or colder than the surrounding skin. Degree 2 is an open wound, the outermost layer of skin (epidermis) and the layer below it (dermis) are damaged, can be in the form of an open wound like a shallow crater with fluid in it. The characteristics are superficial wounds, abrasions, blisters, or form shallow holes. If the skin is injured or torn, a new problem will arise, namely infection. Degree 3 is complete loss of skin including damage or necrosis of subcutaneous tissue or deeper, but not to the fascia. Degree 4 is complete loss of skin layers with extensive damage, tissue necrosis, damage to bone muscles and tendons. Unstageable, in this classification, there is a loss of all tissue where the base of the ulcer is covered by slough (yellow, brown, gray, green or brown) and / or eschar or necrotic tissue (brown, brown or black) around the wound. It is said to be an unstageable classification because the wound is covered by slough and eschar so that it cannot assess the base of the wound and the depth of the wound. Suspected deep tissue injury, in the area around the wound, a purple or maroon discoloration of intact skin can be found due to damage to the underlying soft tissue from pressure (Erika et.al, 2021).

Based on the assumption of researchers, aloe vera has benefits to prevent decubitus wounds because aloe vera extract is used for medicinal purposes. Aloe vera plants consist of anthracene hydroxyl derivatives including aloin A and B2 with an amount of 25-40% of chromone compounds and their derivatives such as aloe resin A, B2, and C. Other important compounds in aloe vera plants include several sugars such as glucose, mannose, and cellulose and various enzymes such as oxidase, amylase, and catalase and also vitamins consisting of B1, B2, B6, C, E, and folic acid, and minerals such as calcium, sodium, magnesium, zinc, copper, and chromium. This content can accelerate healing and prevent decubitus.

During this study, after aloe vera was administered, the patient's skin became moist and well-hydrated, thus preventing injury to areas of skin that were under prolonged pressure or due to prolonged bed rest.

Studies show that because 99% of aloe vera contains water, it can increase skin elasticity and reduce its fragility, muco-polysaccharides along with amino acids and zinc in aloe vera can help improve skin integrity, maintain moisture, and reduce erythema on the skin. The presence of active ingredients contained in aloe vera causes aloe vera to be applied in wound care for acute and chronic types of wounds (Anna et.al., 2022).

Aloe vera plants have anti-inflammatory and immunostimulant effects that play a role in helping the wound healing process. The content of compounds in aloe vera plants generally consists of one or more compounds, including alkaloids, flavonoids, glycosides, saponins, and tannins. Aloe

vera leaves contain vitamins, enzymes, proteins, carbohydrates, minerals (calcium, sodium, magnesium, zinc, iron) and amino acids that act as anti-inflammatories.

Normal wound healing is a complex and dynamic process, but it has a predictable pattern. The wound healing process can be divided into three main phases, namely hemostasis inflammation, proliferation, maturation and remodeling. These phases overlap, and last from the time the wound occurs, until the wound resolution is achieved. Aloe vera belongs to the Lily family (Liliaceae). This plant has been known as a healing plant. Aloe vera has been used for traditional medical purposes in several cultures for thousands of years. In vitro, extracts or components of aloe vera stimulate the proliferation of several types of cells. Many studies have shown that treatment with aloe vera and its extracts makes wound healing faster (Purba & Suherni, 2022).

There are several tools, materials, techniques and nursing interventions that can be applied to prevent pressure injuries in bed rest patients. Tools and materials that can be used include moisturizing materials such as pure coconut oil and aloe vera gel, mattresses as bed supports, and supplements. Supplements are designed as nutrients related to nutritional status and body mass index. Techniques and interventions that can be carried out by nurses include moving bed rest every 2 hours, providing massage therapy such as effleurage massage and neuroperfusion massage techniques and lubricants such as pure coconut oil, applying moisturizers such as aloe vera to the wound area, providing special medications. mattresses for bed rest patients, and providing oral supplements 3x a day. The results of this review serve as a reference for providing appropriate interventions for bed rest patients who are at risk of pressure injuries while being treated in the hospital (Chayati & Nurachman, 2023).

Quite significant results that aloe vera extract is effective and can be used in healing scars. Aloe vera contains mucopolysaccharide compounds that function to heal wounds because they can stimulate fibroblasts that will produce more collagen. In addition, aloe vera also contains Saponin, Sterol, Acemannan and Anthraquinone (Kartini et.al., 2022).

Conclusions

Pressure ulcers (decubitus) are an example of a type of chronic wound where the cost of healing the wound is quite expensive. The use of plants is an appropriate alternative way to treat chronic decubitus wounds. One of the various medicinal plants known to be efficacious for health is aloe vera. With the various components contained in it, aloe vera is known to affect the healing of chronic decubitus wounds. The aloe vera plant has anti-inflammatory and immunostimulant effects that play a role in helping the wound healing process.

The results of the non-parametric statistical test (Wilcoxon) were 0.000 (p value 0.000 <0.05) which means that there is an effect of giving aloe vera in preventing decubitus. Suggestions for health workers In making the results of this study as input and a source of information in providing counseling to patients who are bedridden for a long time to use pharmacological therapy in preventing decubitus, routinely use aloe vera which has many benefits.

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