



Skin Barrier using Aloe Vera and Olive Oil on Prevention of Incontinence Associated Dermatitis in Immobility Patients

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ABSTRACT

Background: Incontinence Associated Dermatitis is an inflammation of the skin that occurs when urine or feces comes in contact with the perineum. The use of a skin barrier that contains moisturizers can prevent skin inflammation. The mechanism of action of moisturizers is found in aloe vera and olive oil, as well as accelerating wound healing, anti-inflammatory, and antimicrobial. **Objective:** To identify the effect of skin barrier aloe vera and olive oil on the prevention of Incontinence Associated Dermatitis in immobility patients. **Methods:** The study was a Quasi-Experiment post-test-only comparison group design. The population was newly admitted immobility patients without Incontinence Associated Dermatitis. A sample of 66 people was divided into the control group and the intervention group, sampling using purposive sampling, analyzed using the Mann Whitney and Kruskal Wallis tests. **Results:** The results showed that there were differences in the values of the three groups, namely the aloe vera, olive oil, and control groups ($p = 0.003$), with the highest control mean value. **Conclusion:** This study revealed that immobility patients who were not given the skin barrier using aloe vera or olive oil experienced the most Incontinence Associated Dermatitis.

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Kata kunci:

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ABSTRAK

Latar belakang: Incontinence Associated Dermatitis adalah peradangan kulit yang terjadi ketika urin atau tinja kontak dengan perineum. Penggunaan skin barrier yang mengandung pelembab dapat mencegah peradangan kulit. Mekanisme kerja pelembab terdapat pada aloe vera dan olive oil, sekaligus dapat mempercepat penyembuhan luka, antiinflamasi, dan antimikroba. **Tujuan penelitian:** Untuk mengidentifikasi pengaruh skin barrier aloe vera dan olive oil terhadap pencegahan Incontinence Associated Dermatitis pasien imobilitas. **Metode:** Jenis penelitian adalah quasi-eksperimen dengan post-test only comparison group design. Populasi adalah pasien imobilitas yang baru masuk tanpa incontinence associated dermatitis. Sampel sebanyak 66 orang dibagi dalam kelompok kontrol dan kelompok intervensi, pengambilan sampel menggunakan purposive sampling, dianalisa menggunakan uji Mann Whitney dan Kruskal Wallis. **Hasil:** Menunjukkan terdapat perbedaan nilai ketiga kelompok, yaitu kelompok aloe vera, olive oil dan kontrol ($p=0,003$), dengan nilai rata-rata kontrol paling tinggi. **Kesimpulan:** Penelitian ini mengungkapkan bahwa pasien imobilitas yang tidak diberikan skin barrier aloe vera maupun olive oil paling banyak mengalami incontinence associated dermatitis.

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INTRODUCTION

Immobility is a condition in which a person cannot move freely due to conditions that interfere with movement (activity), for example experiencing spinal trauma and severe brain injury accompanied by fractures of the extremities. Immobility can cause a person to experience limitations in self-activity, including defecating and urinating. Most patients with immobility will use catheters or pampers. Prolonged use of Pampers can cause skin problems/dermatitis, namely incontinence-associated dermatitis (Black & Hawks, 2014).

Incontinence-associated dermatitis (IAD) is an inflammation of the skin that occurs in the urine or stool contact with the perineum (Beeckman, Damme, Bussche, & Meyer, 2015). Patients with IAD will experience itching, pain, and burning which can lead to discomfort, sleep disturbances, and decreased quality of life. Especially patients on bed rest for a long time, or immobility who experience incontinence which causes the perineal area to become wet with feces and urine.

Areas of skin that often occur with IAD contamination caused by urine or feces are the vulva (labia major) in women or the scrotum in men, the sacrococcygeal and groin (inguinal) folds, so IAD management is needed, one of which is the use of a skin barrier containing a moisturizer. One example of a skin barrier is aloe vera and olive oil (Bliss, Funk, Jacobson, & Savik, 2015). Aloe vera and olive oil have several compositions whose functions are very beneficial for the body, which can accelerate wound healing, have anti-inflammatory, laxative effects, moisturize the skin, antiseptic, and antimicrobial (Nugraha & Rahayu, 2015).

Many studies have examined aloe vera and olive oil, including research conducted by Kon et al. on the Effects of a Skin Barrier Cream on Management of Incontinence Associated Dermatitis in older Women: A cluster Randomized Controlled Trial obtained from 33 patients, 18 patients successful intervention to treat IAD by providing skin cleansers and skin moisturizers (Kon et al., 2017).

METHOD

Participant characteristics and research design

Inclusion criteria were 1) patients suffering physical immobility; 2) age above 18 years; 3) do not have skin problems (e.g. decubitus); 4) patients have not suffered IAD yet; 5) willing to be a respondent and 6) cooperative and composentis. Exclusion criteria were 1) patients can walk and have no limitation of movement and 2) patients are applied ventilator. The study was a quasi-experimental design with pre and post-test and comparison groups.

Sampling procedures

Sixty-six respondents were selected by purposive sampling based on the inclusion, exclusion, and dropout criteria that were done by the researcher. The study was conducted at a public hospital from October 22 to November 30, 2020.

Sample size, power, and precision

The sample was determined based on the power analysis table. In this study, the Cohen's-d formula is used to

determine the effect size (d), where the effect size is the difference between two population means, divided by the average standard deviation. Previously study was conducted by Vijayakumar (2017), the mean of the control group was 35.13 and the mean of the intervention group was 32.30. So the difference mean was 2.83. In this study, the value of SD (σ) was 5. So, with the above formula, the effect size obtained was 0.5. So the number of samples in this study were 20 people in the aloe vera and olive oil intervention group and 20 people in the control group, with a total sample of 60 people, with an estimated drop out of 10% to 66 respondents. So, in this study, the number of samples in the control group was 22 people each and the intervention group was 22 people each for aloe vera and olive oil, so the total sample was 66 people.

Procedures

The procedure for study activities was carried out including the preparation stage such as obtaining permits and conducting a preliminary survey, at the implementation stage the researcher carried out an initial examination of the patient to ensure that the patient did not experience IAD, then the researcher applied it to different intervention groups with aloe vera and olive oil respectively. Rubbing is carried out on the vulva area (labia major) in women or the scrotum in men, sacrococcygeal and groin crease (inguinal) evenly as much as 4 ml. Researchers teach families to apply every change of pampers or not to use pampers at least 3 times a day (morning, noon, and night). For five days the intervention group received skin barrier aloe vera and olive oil, while the control group only received treatment as usual from the hospital. Furthermore, on the sixth day, the skin or skin status will be examined using the Severity Categorization Tool. Monitoring stage, researchers monitored the condition of the skin 2 days later. In data collection and intervention using SOP (Standard Operating Procedure) which has been made to provide the skin barrier aloe vera and olive oil.

Measures

The validity test was not carried out because it used the standard IAD assessment tool from Wounds International 2017. The reliability test in this study was not carried out, because the instrument used was a tool agreed upon by International Wounds 2017 in determining the IAD category (Ousey, 2017).

Data analysis

Analysis of research data was processed with SPSS version 23 using the Mann Whitney and Kruskal Wallis tests because after being tested with the Shapiro-Wilk test, the data were not normally distributed.

RESULTS AND DISCUSSION

Respondents in the aloe vera group, the majority of patients were 17-25 years, sex of the majority were women, the majority of the educational level was high school education, and work as entrepreneurs and housewives, in the olive oil group and the control group, the majority of patients were 56-65 years old, the majority of sex was

female, the majority of education was high school and the majority work is a housewife.

Tabel 1.
Characteristics of Immobility Patients (N=66)

Variable	Aloe Vera		Olive Oil		Control	
	f	%	F	%	F	%
Age (years)						
17-25	8	36.4	2	9.1	2	9.1
26-35	1	4.5	2	9.1	2	9.1
36-45	4	18.2	8	35.4	6	2,3
46-55	3	13.6	1	4.5	2	9.1
56-65	5	22.7	9	40.9	7	31.8
>65	1	4.5			3	13.6
Gender						
Male	12	54.5	9	40.9	15	68.2
Female	10	45.5	13	59.1	7	31.8
Education						
Primary school			3	13.6	1	4.6
Junior high school	6	27.3	7	31.9	7	31.8
Senior high school	15	68.2	9	40.9	12	54.5
College	1	4.5	3	13.6	2	9.1
Profession						
Housewife	9	40.9	8	36.4	6	27.3
Self Employed	9	40.9	6	27.3	11	50.0
Private Employees	1	4.5	3	13.6	1	4.5
Civil Servant					1	4.5
Etc			3	13.6	2	9.1
Doesn't Work	3	13.6	2	9.1	1	4.5

The mean value of immobility patients with IAD in the Aloe Vera group was 0.23 while in the Olive Oil group the mean value of immobility patients who had IAD was 0.14,

and in the control group, the mean value of immobility patients who had IAD was 0.77.

Table 2.
Description of IAD in Patients in the Intervention and the Control Group

IAD	f	%	Mean	SD	Min-Max
Aloe Vera					
No IAD	18	81.8	0.23	0.528	0-2
IAD Category I	3	13.6			
IAD Category II	1	4.5			
Olive Oil					
No IAD	19	86.4	0.14	0.351	0-1
IAD Category I	3	13.6			
IAD Category II	0	0			
Control					
No IAD	10	45.5	0.77	0.813	0-2
IAD Category I	7	31.8			
IAD Category II	5	22.7			

Table 3.
Degree of IAD in Immobility Patients in the Intervention and the Control Group

Variable	Mean Rank	Z	P
Aloe Vera	18.32	-2,30	0.011
Control	26.68		

The results of statistical tests using the Mann Whitney test showed that there was an effect of giving aloe vera skin barrier on the prevention of IAD in immobility patients with a value of p= 0.011.

Table 4.
Degree of IAD in Immobility Patients in the Intervention and the Control Group

Variable	Mean Rank	Z	P
Olive oil	17.66	-2.986	0.003
Control	27.34		

The same thing with olive oil, namely there was an effect of giving olive oil skin barrier on the prevention of IAD in immobility patients, with a value of p=0.003.

Table 5.
Differences in the Effects of Aloe Vera, Olive Oil, and Control on Prevention of IAD

Variable	Mean Rank	P
<i>Aloe Vera</i>	29.89	0.003
<i>Olive Oil</i>	28.09	
Control	42.52	

Furthermore, it was known that there were differences in IAD scores between the three groups, namely the aloe vera, olive oil, and control groups ($p=0.003$). The control means the score was the highest.

The results showed that there was an effect of giving skin barrier aloe vera on the prevention of IAD in immobility patients, as evidenced by the difference in the mean IAD between patients who were given aloe vera skin barrier and patients who were not given aloe vera skin barrier. Aloe vera produces 6 antiseptic agents such as lupeol, salicylic acid, urea nitrogen, cinnamonic acid, phenol, and sulfur. All of these substances are classified as antiseptics because they can kill germs or control the formation of fungal bacteria and viruses (Rajeswari, Umadevi, Selvavenkadesh, & Kumar, 2012). Aloe vera also inhibits the migration of PMN cells (neutrophils) to the inflamed venous tissue, thereby inhibiting venous inflammatory processes. The content of amino acids, glycoproteins, and aloe-emodin in aloe vera accelerates the development of new cells in the regeneration process of the blood vessel epithelium (Khoirini, 2018).

The ability of aloe vera can also be used for wound healing. In the study conducted by Novyana and Susanti regarding Aloe vera for wound healing, it is known that the healing process can be assisted by natural treatment, namely topical application of aloe vera gel which is studied can accelerate the wound healing process because the aloe vera plant can stimulate the proliferation of several types of cells (Novyana & Susanti, 2016).

Based on the study by Nugraha and Rahayu regarding the effect of giving aloe vera to burn patients, it is known that burns gave aloe vera experience faster healing and epitalization of skin tissue because aloe vera contains antiseptic, anti-inflammatory properties and increases tissue granulation (Nugraha & Rahayu, 2015). Furthermore, one strategy to prevent IAD is to use a moisturizer. Based on this, the use of aloe vera cream can help immobility patients to prevent IAD (Coyer & Campbell, 2018).

The results also explained that there was an effect of giving skin barrier olive oil on the prevention of IAD in immobility patients as indicated by the difference in the mean IAD between patients who were given skin barrier olive oil and patients who were not given skin barrier olive oil. The majority of respondents in the control group were 56-65 years old, as many as 7 people (31.8%) and as many as 3 people (13.6%) who were > 65 years old, this caused the average IAD score in the controls to be higher. Extreme age (neonates or elderly) is one of the risk factors for the risk of damage to skin integrity (Rusana, 2016). In contrast to patients who received olive oil, the majority of patients were also in the age range of 56-65 years, but none were > 65 years old, and giving olive oil was known to help treat scars, as well as areas that had wrinkles and cracks due to dry skin or aging skin cells.

The skin is the largest human organ which weighs about 16% of the total body weight. The skin has various functions such as thermoregulation, barrier function (protection), metabolic and regulatory functions, and sensation functions.

With increasing age, there will be a decrease in the function of the barrier (protection) both from the mechanical barrier, immunological barrier, and biochemical barrier (Tan, Firmansyah, & Sylvana, 2020).

The ability of olive oil in skincare can also be seen from the results of the study by Jelita et al. there was a decrease in the degree of diaper rash due to being influenced by the provision of olive oil (olive oil) for three days in the morning and evening as much as 2.5 ml. Giving olive oil containing oiled acid as an anti-inflammatory, cell membrane reconstruction, dermis healing process and contains vitamin E, polyphenols, and chlorophyll which can prevent cell oxidation (Jelita, Asih, & Nurulita, 2016). The same thing according to Setyanti regarding the benefits of olive oil says that olive oil contains emollients that are useful for maintaining damaged skin conditions such as psoriasis and eczema (Setyanti, 2012).

The results also explained that there were differences in IAD scores between the three groups, namely the aloe vera, olive oil, and control groups. The control means the score is the highest. This means that patients who do not get the skin barrier aloe vera or olive oil experience IAD during treatment. Furthermore, it can be seen that the lowest average value is olive oil, which means that the use of olive oil is the best prevention of IAD. In the IAD Severity Categorisation Tool assessment, the results showed that the aloe vera group was present 8 people did not have IAD, 3 people had Category 1, and 1 person had Category 2. Meanwhile, in the olive group oil 19 people didn't have IAD and only 3 people got Category 1. In the control group, 10 people didn't get IAD, 7 people got Category, and 5 people got Category 2.

Novyana and Susanti (2016) said that the skin is a barrier. When this barrier is damaged due to various causes, the skin cannot perform its function adequately. It is therefore very important to restore its integrity as soon as possible. Wound healing involves a complex process. This is the basis for the importance of providing a skin barrier to damaged skin such as IAD. Skincare in this study was carried out in the control group and the intervention group. Skincare in the control group was carried out, as usual, namely cleaning with soap and clean water then drying. Skincare in the intervention group was carried out in almost the same way, namely cleaning, drying then smearing with aloe vera gel and olive oil on the skin area around the vulva (labia major) in women or scrotum in men, sacrococcygeal, and groin creases (inguinal) that have not experienced irritation/blisters (Novyana & Susanti, 2016).

The basic components of moisturizers consist of occlusive, humectant, and emollient. Moisturizing treatments aim to keep the skin's water content between 10% and 30% and reduce water evaporation. Moisturizing skin products have been recommended for daily use (Nuzantry & Widayati, 2015). Also, the study said that the moisture effect of aloe vera has been proven in the form of a topical product with good moisturizing basic components consisting of occlusive, humectant, and emollient (Novyana & Susanti, 2016).

CONCLUSIONS AND SUGGESTIONS

Based on the results of the study, it is known that giving skin barrier aloe vera to the prevention of incontinence associated dermatitis in immobility patients has changed from 22 samples, only 3 people who get Incontinence

Associated Dermatitis in category 1 and 1 person in category 2, while olive oil is more significant because of the 22 samples only. 3 people who experienced Incontinence Associated Dermatitis up to category 1 only, and a control group of 22 samples who experienced Incontinence Associated Dermatitis 7 people in category 1 and 5 people in category 2. So it can be concluded from the aloe vera, olive oil, and control groups among the three groups This olive oil is the best skin barrier for now. It is hoped that nurses apply the use of aloe vera and olive oil skin barriers in preventing IAD and can also use them as non-pharmacological therapy for the treatment of patients with IAD.

ETHICAL CONSIDERATIONS

This study was approved by The Research Ethics Committee, Universitas Sumatera Utara No. 442/KEP/USU/2020.

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Conflict of Interest Statement

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