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The Effect of Virgin Coconut Oil (VCO) with Lotion on Skin Moisture among Uremic Patients Undergoing Hemodialysis in Hospital Binjai City, Indonesia

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Abstract. Chronic kidney failure is a public health problem in the world. Chronic kidney failure could cause clinical symptoms in various body systems. This study aimed to examine virgin coconut oil (VCO) effect on skin moisture among uremic patients undergoing hemodialysis. We applied the quasi-experimental research, pre-test, and post-test with a non-equivalent control group. The study was conducted at the Regional General Hospital, Dr. RM. Djoelham Binjai. Eighty samples were recruited and allocated to an intervention group (n=40) and the control group (n=40). The results showed a significant effect of skin moisture in the intervention group before and after receiving the virgin coconut oil (p-value<0.05). There was a significant effect of skin moisture among the intervention group compared to the control group after receiving the program (p-value<0.05). It is recommended to health workers to practice correctly and appropriately how to administer Virgin Coconut Oil (VCO) to uremic patients undergoing hemodialysis to be done at home.

Keyword: Virgin Coconut Oil, Lotion, Uremic Patients, Hemodialysis, Skin Moisture

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INTRODUCTION

Chronic kidney failure is a public health problem worldwide. The United States stated the prevalence of kidney failure is increasing by 20-25% every year (1). It is estimated that more than 20 million (more than 10%) of adults in the United States experience chronic kidney disease annually. Cases of kidney disease in the world per year increased by more than 50%. Data from the United States showed the number of patients with acute kidney failure in hospitals increased from year to year by 4.9% in 1983; 7.2% in 2002; 20% in 2012 (2).

Stated chronic kidney failure is caused by decreased kidney function and protein metabolic residues called uremic toxins (3). Uremic develops more frequently with chronic kidney disease but can also occur with acute kidney failure if kidney function loss is rapid (4). One of the problems that often arise in chronic renal failure is skin integrity disorders such as itching (pruritus), dry skin (xerosis), and skin discoloration (skin discoloration), which affects 50% -90% of patients with peritoneal dialysis or hemodialysis. Until severe, according to the final stage of kidney disease.

The results showed that 80% of 100 HD patients complained of skin problems with general xerosis findings, 79%, pale 60%, pruritus 53%, and skin pigmentation 43% (5). Impaired skin integrity is a disturbing problem in patients with end renal failure undergoing hemodialysis (6).

Impaired skin integrity is a disturbing problem in patients with end renal failure undergoing hemodialysis (6). Pruritus or itching is the most common symptom of advanced kidney disease. Patients with chronic kidney failure, 15-49% experience pruritus, and those who undergo dialysis 50-90%. Acute renal failure, pruritus is very rare. The prevalence is slightly more generous in hemodialysis patients at 42% and in peritoneal dialysis patients at 32% (7).

First, skincare by keeping the skin clean and dry uses a skin cleanser with a balanced pH (8). One of the interventions in maintaining the skin's integrity is providing lubricant moisturizers such as lotions, creams, ointments, low alcohol, or protective skin barriers such as liquid barrier films, transparent films, and hydrocolloids.

Skincare using a moisturizer (moisturizer) is believed to be an inexpensive action, does not harm, and allows for implementation. However, the advantages and effectiveness of specific topical ingredients, which are more superficial, cannot yet be explained (9).

VCO is believed to be good for skin health because it is easily absorbed by the skin and contains vitamin E (10). Virgin Coconut Oil contains natural moisturizers and helps maintain skin moisture and is suitable for dry, rough, and scaly skin. VCO contains medium-chain fatty acids (MCFA) that easily enter the deep skin layers and maintain skin elasticity and suppleness (11). Research conducted by Malaysia found that moisturizing lotions with VCO-SLPs containing virgin coconut oil of 20% increases skin moisture and increases skin elasticity (12). There was a 24.8% increase in skin moisture for lotions with VCO-SLPs compared to a 12.7% increase in skin moisture.

OBJECTIVES

The study aimed to examine virgin coconut oil (VCO) effect on skin moisture among uremic patients undergoing hemodialysis.

METHOD

The researcher applied the quasi-experimental study design, pre-test, and post-test with a non-equivalent control group. In this study, the sample size was determined using a power analysis table. The large number of samples based on the power analysis table with equal power was (1-β) = 0.80, and the effect size was more than0.55 with a significant level (alpha [α]) = 0.05. The number of samples obtained is equal to 40 respondents in each group.

The inclusion criteria in this study are: 1) Patients with dry skin undergoing hemodialysis, 2) Age ≥ 40 years, 3) Carry out routine hemodialysis modality therapy for more than six months, 4) Patients and families can communicate and read and write using the Indonesian language, 5) Willing and willing to cooperate in conducting research (shown by filling in the participant's approval width). While the exclusion criteria that will be used to eliminate respondents who meet the inclusion criteria in this study are: 1) Do not use moisturizers in the last two weeks, 2) Have a history of mental disorders, 3) Impaired orientation, 4) Treatment using psychotropic drugs.

Data collection was performed using a skin moisture assessment sheet with several stages in the experimental and control group (pre-test) using the Skin Moisture Analyzer Instrument. A validity test Measuring instrument for skin moisture assessment, namely: Skin Moisture Analyzer, is a measuring tool used to measure skin moisture levels that are easy to use. The validity and reliability test was carried out to measure instruments as high quality and can be used. An instrument's reliability is determined based on statistical calculations with a range of values from 0 to 1. The value of 1 indicates correctly.

Skin Moisture Analyzer is a digital tool that is widely used in the field of beauty and health. This tool has a remarkable ability to measure the level of skin moisture. The skin moister meter automatically detects the skin condition and displays the LCD screen results as a percentage figure. The skin moister meter reads an electrical resistance of the skin that will depend on hydration and dryness. The average value of skin moisture 35-40%.

Researchers would recruit research assistants with the aim of assisting researchers in conducting research. Requirements for research assistants are 1) having a bachelor's educational background, 2) working experience as a hemodialysis nurse of at least three years. In addition to nurses, researchers recruited families to serve as research assistants to help researchers apply the VCO to be carried out at home.

Variables (gender, education level, marital status, occupation) are displayed in proportions. Simultaneously, the numeric variables (age, socioeconomic status) are presented in values in frequencies and percentages. Bivariate analysis was performed to determine skin moisture after being given virgin coconut oil in both the pre-test and post-test groups using a statistical analysis dependent t-test (paired-sample t-test). Meanwhile, before and after receiving the intervention between the intervention and control groups, the skin moisture was examined using an independent t-test. The normality and homogeneity of the variables should be tested before using bivariate analysis.

Ethical Committee of Faculty of Nursing Sciences of the University of Sumatera Utara. The permission permit should be obtained from the Research Directorate of RSUD dr. R.M. Djoelham Binjai. At the implementation stage, the sample was divided into two groups: patients for the intervention group and patients for the control group. In the intervention group, the topical Virgin Coconut Oil was administered. The patients were given topical VCO. This action is done twice a day after bathing for 4-5 minutes. Whereas in the control group, the lotion was given twice a day after washing for 4-5 minutes.

RESULTS

Characteristics of respondents

Table 1 described the characteristics of the respondents. The majority of respondents in the intervention group were <47 years (62.5%), and the control group was <47 years (57.5%). There were 50.0% of the men and women in the intervention group, respectively, while most control groups were women (55.0%). The majority of the intervention group respondents had a junior high school education (37.5%); most of the control group had a junior high school education (40.0%). The majority of respondents in the intervention group worked as laborers (30.0%). (35.0%) Based on marital status, most respondents in the intervention group were not married (52.5%), while most respondents in the control group were married (75.0%). The majority of respondents in the intervention group underwent hemodialysis <2 years (77.5%). Therefore, the majority of the control group underwent hemodialysis <2 years (82.5%).

Table 1. Frequency Distribution of Respondents by Characteristics

Characteristics	Intervention Groups		Control Groups	
	n=40	%(100)	n=40	%(100)
Age:				
<47 yearsold	25	62.5	23	57.5
≥47 years old	15	37.5	17	42.5
Gender:				
Male	20	50.0	18	45.0
Female	20	50.0	22	55.0
Education:				
Elementary school	07	17.5	08	20.0
Middle school	15	37.5	16	40.0
High school	11	27.5	10	25.0
University	07	17.5	06	15.0
Occupation:				
Labor	12	30.0	14	35.0
Teacher	07	17.5	03	7.5
Housewife	06	15.0	08	20.0
Farmers	10	25.0	12	30.0
Indonesian State Army	04	10.0	0	0
Civil servants	01	02.0	03	7.5
Entrepreneur	00	0	0	0
Marriage Status:				
Single	04	10.0	03	7.5
Married	36	90.0	37	92.5
Lama HD :				
< 2 years	31	77.5	33	82.5
≥ 2 years	09	22.5	07	17.5

Skin moisture of uremic patients in the intervention and control groups before pre-test and post-test

Table 2 showed the skin moisture among respondents in the intervention group before receiving the VCO. The findings indicated that all respondents' skin moisture was in the dry category (100.0%) for the intervention and control group.

Skin moisture data analysis results are average in the intervention group respondents after being given a VCO (62.5%), a small proportion in the wet category (37.5%). Likewise, respondents' skin moisture in the control group after being given lotion also showed the same thing: the majority of skin moisture respondents in the normal category were 38 people (95.0%), a small portion in the wet category was two people (5.0%).

The mean difference of skin moisture among the intervention group before and after receiving VCO

The findings explained that VCO's effect on skin moisture before and after receiving the program among the intervention group. The results found that the mean of patients in the intervention group was (M=35.50; SD=1.132). While, after receiving the VCO, the mean of skin moisture was (M=43.50; SD=2.837). Thereby, there is a significant difference before and after receiving the intervention among the intervention group with a p-value<0.001.

Table 3. The effect of VCO on skin moisture among the intervention group before and after receiving the program

skin moisture	***Mean***	**Standard Deviation**	**95%CI**		**t-count**	***p-value***
			Lower	***Upper***		
Before	35.50	1.132	-8.818	-7.180	-19.748	0.000
After	43.50	2.837				

The mean difference of skin moisture among the intervention group before and after receiving lotion

The findings explained the effect of lotion on skin moisture before and after receiving the program among the control group. The results found that the mean of patients in the intervention group was (M=35.45; SD=1.299). While, after receiving the lotion, the mean of skin moisture was (M=40.17; SD=1.838). Thereby, there is a significant difference before and after receiving the intervention among the intervention group with a p-value<0.001.

Table 4. The mean difference of skin moisture among the intervention group before and after receiving lotion

skin moisture	***Mean***	**Standard Deviation**	**95%CI**		**t-count**	***p-value***
			Lower	***Upper***		
Before	35.45	1.299	-5.177	-4.272	-21.134	0.000
After	40.17	1.838				

The mean difference of skin moisture among the intervention group and the control group with uremic patients undergoing hemodialysis after receiving the treatment

The independent t-test found that the mean value in the intervention group, which was receiving the VCO was 43.5, and the control group receiving the lotion was 40.1. It was indicated that the average skin moisture of uremic patients undergoing hemodialysis in the intervention group was higher than the control group. The significant result was p-value=<0.05.

Table 5. The mean difference of skin moisture among the intervention group and the control group with uremic patients undergoing hemodialysis after receiving the treatment

Group	Mean	St. Dev.	Std. Error Mean	df	t	p
Intervention	43.5	2.837	0.448	78	6.220	0.000
Control	40.1	1.838	0.290			

DISCUSSION

CKD patients with hemodialysis have the side effects of discomfort in the form of skin disorders. Disorders of the skin such as itching, dry skin, and striped/black skin. The cause of itching of the skin due to dry skin, high levels of urea, calcium, phosphate, and increased histamine and iron buildup levels are caused because the kidneys can not remove the remnants' metabolism [13]. Chronic Kidney Failure (CHD) patients undergoing hemodialysis (HD) have complex problems such as dry skin that often triggers uremic events.

Based on the study results, the skin moisture score in the intervention group (VCO) was 43.5 and in the control group was 40.1. Thus, the skin moisture of uremic patients who underwent hemodialysis in the intervention group after being given VCO was higher than the lotion. The increase occurred by 8%. Before being given VCO, the average skin moisture was 35.50%, and after being given VCO, it increased to 43.50%. Giving VCO, which is done two times a day, i.e., morning and evening, in 2 weeks (14 days) on the face, back of hands, and feet can increase uremia patients' skin moisture hemodialysis at the Regional General Hospital Dr. RM. Djoelham Binjai. TheMostspondents initially in the category of dry skin after being given VCO intervention, most respondents' skin became normal, and some were already moist.

One of the traditional medicines that can be used for the skin is virgin coconut oil. This natural material is easily found around us, so it can reduce the costs incurred and reduce the side effects of drugs that will aggravate the kidney work of patients with chronic kidney failure (14). Antioxidant elements and vitamin E in VCO are used as a protective skin to soften the skin (15). Virgin Coconut Oil also has advantages in terms of the medium-chain fatty acid (MCFA) content, a component of medium-chain fatty acids that has many functions, including moisturizing dry skin. The use of VCO can reduce the risk factors for pruritus, such as dry skin, to become moist on clients with chronic renal failure by hemodialysis (16).

This study is in line with research conducted at Wangaya Hospital, showing an increase of 15.19% of foot skin moisture in the experimental group and a decrease of 0.39% of foot skin moisture in the control group (only usual care, without intervention) (17). This means that skin moisture increases after being given virgin coconut oil, while those not treated get decreased skin moisture. Based on the independent sample t-test, there was a significant effect of virgin coconut oil on foot skin moisture. Research conducted in the Hemodialysis Room of Abdul Wahab Syahrin Hospital showed that continuous administration of Virgin Coconut Oil would have a good effect on skin integrity in chronic renal failure patients. The visual analog scale (VAS) scores in pre-intervention were 8 (severe pruritus), and post-intervention was 6 (moderate pruritus), so that this action is an effective and efficient action for the patient (18). Another study at the ICU of Soedarso Regional Hospital Pontianak that based on observations obtained during the research, the researcher believes that there is an influence between VCO's administration (Virgin Coconut Oil) on pressure sores on the skin (19).

In line with research that the application of lotions or moisturizers for three weeks on the skin of patients with atopic dermatitis (DA) children has been proven to be effective in improving skin barrier (reducing Transepidermal Water Loss / TEWL), significantly improving skin dryness (20). Various studies have proven to use moisturizers is the most effective way to maintain skin moisture. According to the research that examined more than 20,000 dermatologists practicing, lotions can help moisturize the skin. This also applies to patients with chronic kidney failure who undergo hemodialysis to moisturize dry skin.

In Malaysia, it was found that moisturizing lotion with VCO-SLPs containing 20% virgin coconut oil was effective in increasing skin moisture and increasing skin elasticity[12]. There was a 24.8% increase in skin moisture for lotions with VCO-SLPs compared to a 12.7% increase in skin moisture. Research conducted on DM patients in Salatiga City Hospital about coconut oil's effect on reducing itching showed that as many as 20 respondents experienced pruritus in the moderate category (21). Another study conducted on the scale of pruritus in patients with chronic kidney failure showed that as many as 91 patients with chronic kidney failure who experienced pruritus with a moderate category (22).

According to researchers, this study's results prove that VCO's use is more effective than using lotions to moisturize the skin of uremic patients undergoing hemodialysis. This can be seen from the statistical test results and the average percentage increase in skin moisture score. Statistically seen that there were differences in skin moisture in the two groups studied. While in percentage, the increase in skin moisture was higher in the intervention group than in the control group. The intervention group's increasing skin moisture was 8.00%, while the control group was 4.72%.

This study indicates that the use of lotions or skin moisturizers can also increase the skin moisture of uremic patients undergoing hemodialysis at the Regional General Hospital Dr. RM. Djoelham Binjai. Generally, dry and itchy skin in patients with chronic kidney failure undergoing hemodialysis does not resemble allergies (not to cause reddish bumps). And if the patient gives a moisturizing lotion on his skin, the symptoms of dryness and itching can subside. For patients who do not have VCO can use lotions or ordinary skin moisturizers that are sold freely. Use lotion on the face, back of hands, and feet regularly for 14 days (2 weeks), i.e., in the morning and evening after bathing. It is proven that regular use of lotions can also increase the skin moisture of uremic patients undergoing hemodialysis.

Based on literature and several studies show that virgin coconut oil, the best oil because it protects against skin infections, softens and moisturizes, and prevents wrinkles and sagging of the skin. While the use of ordinary lotion generally uses a component of water so that when the lotion is used will provide a moment of freshness. However, when the water content is lost due to evaporation, the skin will return to normal or dry. Virgin coconut oil has antioxidants and vitamin E. If used as a protective skin, it will be able to moisturize the skin. It was indicated that the skin of uremic patients who received the VCO was better compared to patients undergoing hemodialysis who received the lotion. For this reason, uremic patients undergoing hemodialysis can be given regular VCO in the morning and evening to maintain skin moisture and has been proven effective.

CONCLUSION

This study concluded that there is no difference between VCO and lotion administration in providing skin moisture for uremic patients in hemodialysis patients in Binjai city hospital. It was due to saturated fatty acids (saturated fatty acids), which reach 90%. In contrast, saturated fat content in the marina lotion is only 55%. The study results using VCO in the intervention group of patients are moister than in the control group that uses lotion.

STRENGTH AND LIMITATION

Limitations in conducting this research are: 1) Giving VCO needs to be considered how to use, the amount of VCO used and length of administration because it will significantly affect the results of skin moisture that can make the skin oily, 2) VCO used should be made by yourself to get VCO desired and get good results.

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