The Effect of virgin Coconut Oil (VCO) with Lotion on the Skin Moisture among Uremic Patients Undergoing Hemodialysis

Siti Saodah1, Imam Budi Putra2, Cholina Trisa S3
1Master Student, Faculty of Nursing, Universitas Sumatera Utara, Indonesia, 2 Lecturer, Faculty of Medicine, Universitas Sumatera Utara, Indonesia, 3Lecturer, Faculty of Nursing, Universitas Sumatera Utara, Indonesia

Abstract

Objects: to examine the effect of Virgin Coconut Oil on the skin moisture among uremic patients undergoing hemodialysis.

Methods: the study was a quasi-experiment with a pre-test and post-test equivalent control group. The study population was 80 persons.

Results: The results showed that there was a significant effect of skin moisture on the intervention group before and after being given Virgin Coconut Oil. Data were analyzed by pair t-test and independent test.

Conclusion: There is no need for special emulsions such as Virgin Coconut Oil to moisturize the skin in uremic patients undergoing hemodialysis because of using ordinary lotions can moisturize the skin, but it must be used regularly, twice a day after bathing, the lotion used must also be a lotion that does not contain mercury as well as chemicals that can harm the skin.

Keywords: Virgin Coconut Oil; Lotion; Uremic Patients; Hemodialysis; Skin Moisture

Introduction

Chronic Kidney Disease (CKD) is a public health problem worldwide. According to the United States, 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 CKD annually. CKD is increasing by more than 50% in the world annually. In the United States, Patients with acute kidney failure hospitals increased from year to year by 4.9% in 1983; 7.2% in 2002; 20% in 2012(2).

CKD is caused by a decrease in kidney function and the accumulation of protein metabolic residues called uremic toxins(3). Uremic develops more frequently with chronic kidney disease but can also occur with acute kidney failure if the loss of kidney function is rapid(4). One of the problems that often arise in CKD 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(5).

According to Specchio, Carboni, Chimenti, Tamburi, and Nisticò(6) said that 80% of 100 hemodialysis patients complained of skin problems with general findings of xerosis 79%, pale 60%, pruritus 53%, and skin pigmentation 43%. Impaired skin integrity is a very disturbing problem in patients with end renal failure undergoing hemodialysis(7). Pruritus or itching is the most common symptom of advanced kidney disease. For 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 greater in hemodialysis patients at 42% and in peritoneal dialysis patients at 32%(8).

The skincare, first by keeping the skin clean and dry, uses a skin cleanser with a balanced pH(9). One of the interventions in maintaining the integrity of the skin is
providing lubricant moisturizers such as lotions, creams, and 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 cause harm, and allows it to be implemented but the advantages and effectiveness of specific topical ingredients which are simpler cannot yet be explained\(^{(10)}\).

Virgin Coconut Oil (VCO) is believed to be good for skin health because it is easily absorbed by the skin and contains vitamin E\(^{(11)}\). VCO contains natural moisturizers and helps maintain skin moisture and is good 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\(^{(12)}\). The study was conducted by Noor, Aziz, Sarmidi, and Aziz \(^{(13)}\) found that moisturizing lotions with VCO-SLPs containing virgin coconut oil of 20% were to be effective in increasing skin moisture and increasing skin elasticity. There was a 24.8% increase in skin moisture for lotions with VCO-SLPs compared to a 12.7% increase in skin moisture. The study aimed to determine the effect of Virgin Coconut Oil on the skin moisture of uremic patients undergoing hemodialysis.

**Methods**

**Design**

A quasi-experimental study design pre-posttest with a non-equivalent control group was applied in this study.

**Participants**

Eighty persons were selected by consecutive sampling who met the following criteria, namely: (a) patients with dry skin undergoing hemodialysis; (b) age \(\geq 40\) years; (c) performing routine hemodialysis modality therapy for more than 6 months; (d) patients and families can communicate and read and write in Indonesian; and (e) willing and willing to cooperate in conducting research (which is shown by filling in the width of the participant’s agreement). Exclusion criteria, namely: (a) didn’t use moisturizer in the last 2 weeks; (b) have a history of mental disorders; (c) orientation disturbances; and (d) treatment using psychotropic drugs.

**Procedures**

The study was conducted at the Hemodialysis unit in dr.RM. Djoelham Binjai Hospital from April to May 2018. Ethical Committee of Faculty of Nursing Sciences of the University of Sumatera Utara then after research permission permit received from Research Directorate of dr. R.M. Djoelham Binjai hospital. Intervention group: 1) Pre-intervention: assess skin moisture before treatment; describes the VCO application protocol; prepare the VCO to be used, 2) intervention: distribute VCO five minutes before action; explain the VCO application protocol again; before the action is carried out the researcher teaches the patient’s family how to give VCO for the treatment of actions at home, before the action is carried out the respondent is recommended to first clean the skin in the predetermined parts, namely on the face, back of the hands, hands and feet while being given massage; the action of applying VCO is carried out twice a day after bathing; observing the action using the observation sheet given to the client and family, if the patient performs according to the protocol, a checklist (√) is marked on the observation sheet, but if the patient does not follow the protocol, a strip is marked (-) on the observation sheet, 3) Post-intervention: assess the patient’s skin moisture on day 1 to day 28 after VCO administration.

**Research instrument**

Skin moisture analyzer is an electronic digital tool that can be used to determine skin moisture. This tool has the main use in determining the moisture value of human skin. With an assessment of \(\leq 33\% = \text{very dry skin}\), with a value of 34-37% = dry skin, with a value of 38-42% = normal skin. Measurements are made by gently pressing the tip of the skin moisture analyzer on the skin of the patient’s hands and feet. Leave this tool on the skin until the tool is done detecting. Once the tool has fully detected, there is a beep and the screen will show the result as a percentage (%).

**Data analysis**

Data analysis was conducted to determine skin moisture after being given VCO to both groups pre and post using statistical analysis paired t-test. Meanwhile, to see differences in skin moisture after treatment between the intervention group and the control group
using statistical analysis independent t-test.

## Results

### Table 1. frequency distribution of respondents by characteristics (n=80)

| No | Characteristics | Intervention |    | Control |    |
|----|-----------------|--------------|----|---------|----|
|    |                 | n=40 | % (100) | n=40 | % (100) |
| 1. | Age:            |      |         |      |         |
|    | a. <47 years old| 25   | 62.5    | 23   | 57.5    |
|    | b. >47 years old| 15   | 37.5    | 17   | 42.5    |
| 2. | Gender:         |      |         |      |         |
|    | a. Male         | 20   | 50      | 18   | 45      |
|    | b. Female       | 20   | 50      | 22   | 55      |
| 3. | Education:      |      |         |      |         |
|    | a. Elementary school | 07 | 17.5  | 08 | 20      |
|    | b. Junior school | 15  | 37.5  | 16 | 40      |
|    | c. High school  | 11  | 27.5  | 10 | 25      |
|    | d. University   | 07  | 17.5  | 06 | 15      |
| 4. | Occupation:     |      |         |      |         |
|    | a. Labor        | 12  | 30     | 14  | 35      |
|    | b. Teacher      | 07  | 17.5  | 03  | 07.5    |
|    | c. Housewife    | 06  | 15    | 08  | 20      |
|    | d. Farmers      | 10  | 25    | 12  | 30      |
|    | e. Indonesian State Army | 04 | 10  | 00 | 00      |
|    | f. Civil servants| 01 | 02   | 03 | 07.5    |
|    | g. Entrepreneur  | 00  | 00    | 00 | 00      |
| 5. | Marriage Status:|      |         |      |         |
|    | a. Single       | 04  | 10     | 03  | 07.5    |
|    | b. Married      | 36  | 90     | 37  | 92.5    |
| 6. | Lama HD:        |      |         |      |         |
|    | a. < 2 years    | 31  | 77.5   | 33  | 82.5    |
|    | b. > 2 years    | 09  | 22.5   | 07  | 17.5    |
Table 1. shows that the majority of respondents in the intervention group were <47 years (62.5%), as well as respondents in the control group, were <47 years (57.5%). In the intervention group, there were 50% of the men and women respectively, while the majority of the control group were women 55%. The majority of respondents in the intervention group had a junior high school education at 37.5%, the majority in the control group had a junior high school education 40%. The majority of respondents in the intervention group worked as laborers 30%. 35.5% Based on marital status, the majority of respondents in the intervention group were not married 52.5%, while the majority of respondents in the control group were married 75.0%. The majority of respondents in the intervention group underwent hemodialysis <2 years (77.5%), so did the majority of the control group underwent hemodialysis <2 years (82.5%).

Tabel 2. distribution of respondents based on skin moisture before and after treatment (n=80)

| No. | Skin Moisture | Intervention | Control |
|-----|---------------|--------------|---------|
|     | Pretest | Posttest | Pretest | Posttest |
| f | % | f | % | F | % | f | % |
| 1. | Dry | 40 | 100 | 0 | 0 | 40 | 100 | 0 | 0 |
| 2. | Normal | 0 | 0 | 25 | 62.5 | 0 | 0 | 38 | 95 |
| 3. | Oily | 0 | 0 | 15 | 37.5 | 0 | 0 | 2 | 5 |

Table 2. shows the skin moisture of the respondents in the intervention group before being given a VCO based on the category indicates that all of the respondents’ skin moisture was in the dry category, likewise the skin moisture of the respondents in the control group before being given a lotion also showed the same thing that all the respondents’ skin moisture was in the dry category. The results of skin moisture data analysis were normal in the intervention group respondents after being given a VCO 62.5%, a small proportion in the wet category 37.5%. Likewise, the skin moisture of respondents in the control group after being given lotion also showed the same thing that the majority of skin moisture respondents in the normal category were 38 persons 95%, a small portion in the wet category was 2 persons 5%.

Table 3. paired sample t-test results from the effect of skin moisture before and after being given a VCO

| VCO | Mean | SD | 95%CI | t-count | p-value |
|-----|------|----|-------|---------|---------|
|     |      |    | Lower | Upper   |         |
| Before | 35.5 | 1.132 | -8.818 | -7.180 | -19.748 | 0.000 |
| After  | 43.5 | 2.837 |         |         |         |       |
Table 3 shows that the value of t-count (-19.748) < t-table (1.684) and significant value (0.000 < 0.05) then there was an influence (difference) significant skin moisture before being given a VCO (pretest) with skin moisture after being given a VCO (posttest). A negative value on the results of the t-test means the average value before being given a VCO was lower than after being given a VCO.

Table 4. paired sample t-test results in the effect of skin moisture before and after being given a lotion

| Lotion | Mean | SD. | 95%CI | t-count | p-value |
|--------|------|-----|-------|---------|---------|
| Before | 35.45| 1.299| -5.177-4.272 | -21.134 | 0.000   |
| After  | 40.17| 1.838| -4.272 |         |         |

Table 4. shows that the value of t-count (-21,134) < t-table (1.684) and significant value (0.000 < 0.05) then there was an influence (difference) that significant skin moisture before being given a lotion (pretest) with skin moisture after being given a lotion (posttest). A negative value on the t-test results means the average value before being given a lotion was lower than after being given a lotion.

Table 5. independent samples test results t-test the effect of viving VCO and lotion on skin moisture of uremic patients undergoing hemodialysis

| 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           |    |           |         |

Table 5. shows that the mean value in the intervention group (VCO) was 43.5 and the control group (lotion) was 40.1, this value meant the average skin moisture of uremic patients undergoing hemodialysis in the intervention group (VCO) of 43.5 and the control group (lotion) of 40.1. Thus it can be said that the skin moisture of uremic patients who underwent hemodialysis in the intervention group after being given VCO was higher than the lotion. The results of paired sample t-test analysis obtained t value > t table or 6.220 > 1.664 at df (degree of freedom) 78 and obtained a significant value of p = 0.000 < 0.05, it means that there is an influence (difference) between the provision of VCO and lotion against the skin moisture of uremic patients undergoing hemodialysis. To increase skin moisture to be normal, giving lotion is better than VCO, because by giving lotion more skin becomes normal, while using VCO the skin becomes more oily than giving lotion.

Discussions

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, and phosphate as well as increased levels of histamine and iron buildup, this is caused because the kidneys cannot remove the...
remnants of metabolism\textsuperscript{(14)}. CKD patients undergoing hemodialysis (HD) have complex problems such as dry skin that often triggers uremic events.

Based on the results of the study the skin moisture score in the intervention group (VCO) was 43.5 and in the control group was 40.1. Thus it can be said that 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 2 times a day ie morning and evening, in 2 weeks (14 days) on the face, back of hands, and feet can increase the skin moisture of uremia patients undergoing hemodialysis at the Regional General Hospital dr. RM. Djoelham Binjai. The majority of respondents who were initially in the category of dry skin after being given intervention with VCO the majority of 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 number of costs that must be incurred and reduce the side effects of drugs that will aggravate the kidney work of patients with CKD\textsuperscript{(15)}. Antioxidant elements and vitamin E in VCO are used as a protective skin that can soften the skin\textsuperscript{(16)}. Virgin Coconut Oil also has advantages in terms of the content of the medium-chain fatty acid (MCFA) which is a component of medium-chain fatty acids that has many functions, including being able to moisturize 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\textsuperscript{(17)}.

This study is in line with Eka, Laily, Saragih, and Sirait\textsuperscript{(18)} show 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) it 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 damage to skin integrity in chronic renal failure patients with visual analog scale (VAS) scores pre-intervention 8 (severe pruritus) and post-intervention 6 (moderate pruritus) so that this action is an effective and efficient action for the patient\textsuperscript{(19)}. In 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 the administration of VCO (Virgin Coconut Oil) on pressure sores on the skin\textsuperscript{(19)}.

In line with research that the application of lotions or moisturizers for 3 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\textsuperscript{(20)(20)(20)}. In Malaysia found that moisturizing lotion with VCO-SLPs containing 20% virgin coconut oil was found to be effective in increasing skin moisture and increasing skin elasticity\textsuperscript{(13)}.

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 the effect of coconut oil on reducing itching showed that as many as 20 respondents experienced pruritus in the moderate category\textsuperscript{(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\textsuperscript{(22)}.

Conclusions

The administration of Virgin Coconut Oil is no more effective in providing skin moisture for uremic patients in hemodialysis patients than lotions. This is because VCO contains saturated fatty acids (saturated fatty acids) which reach 90% whereas saturated fat content in marina lotion is only 55% so that the results of the study using VCO in the intervention group of patients moreover moist than in the control group that uses lotion.

Conflict of Interest: Nil

Source of Funding: No funding this is a study

Ethical Consideration: This research has passed the
test of ethics from the health research ethics committee of the Nursing Faculty of Universitas Sumatera Utara, with registration number 1630/II/SP/2019.

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