

# The Effect of VCO (Virgin Coconut Oil) Therapy for Skin Moisture in Chronic Kidney Client

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**Keywords:** VCO (Virgin Coconut Oil), Skin moisture, Chronic Kidney

**Abstract:** Chronic Kidney Failure Patients who undergo hemodialysis (HD) have complex problems such as dry skin that often triggers itching, itching is experienced by patients with chronic renal failure results in a disturbance in skin moisture. VCO (Virgin Coconut Oil) is pure coconut oil which is used to treat complaints of itching and dry skin experienced by clients. The purpose of this research to determine the effect of VCO (Virgin Coconut Oil) therapy on skin moisture in clients with Chronic Kidney Failure with Hemodialysis at RS Grand Mark Lubuk Pakam. The design of this research is Quasi experimental, Design with non equivalent pretest-posttest control group design, using control group and intervention group. The sample consisted of 52 respondents, consisting of 26 respondents as an intervention group who was given VCO therapy and 26 respondents as a control group. The statistical test used was the Dependent T test and the Independent T test. The results showed that there was a significant influence between the control group and the intervention group before and after the intervention (P Value = 0,000). The results of this study can be used as an alternative therapy for clients experiencing skin dryness using VCO (Virgin Coconut Oil), especially in clients with chronic kidney failure with hemodialysis.

## 1 INTRODUCTION

Chronic Kidney Disease (CKD) is a chronic disease that progressively damages the kidneys and disrupts the balance of fluids and body electrolytes that affect the whole systems. (Hasneli, 2017). *World Health Organization* (WHO) released data on growth for the number of people with chronic kidney failure in the world in 2013 increased by 50% from the previous year and in America the incidence of chronic kidney failure increased by 50% in 2014 and every year 200.000 Americans undergo hemodialysis. The incidence of kidney failure in the world globally is more than 500 million people and those who have to undergo hemodialysis around 1.5 million people (Yuliana, 2015). It is estimated that the number of CKD sufferers in Indonesia is around 70,000 people and those undergoing hemodialysis are 10,000 people (Tandi, Mongan, & Manoppo, 2014 in Hasneli, 2017).

In one third of CKD patients complain of symptoms of lack of energy (76%), pruritus (74%), drowsiness (65%), dyspnea (61%), edema (58%), pain (53%), dry mouth (50%), muscle cramps (50%),

lack of appetite (47%), poor concentration (44%), dry skin (42%), sleep disturbance (41%), and constipation (35%). (Aisara, 2018).

Uremic pruritus is a common complication and affects the quality of life of patients with Terminal Chronic Kidney Failure undergoing Hemodialysis (HD). Uremic pruritus is most often described as a daily or almost daily itching event that stretches bilateral symmetrical surface area. Uremic pruritus can vary from general itching that attacks the back, face and arms. (Daryaswanti, 2018).

Uremic pruritus has no specific etiology, but several factors that cause pruritus are mentioned such as dry skin, reduced transidermal elimination of pruritogenic factors, hyperparathyroidism, increased histamine levels, increased mast cell proliferation in the skin and increased levels of calcium, magnesium and high phosphate. Non-pharmacological interventions that have been studied can reduce uremic pruritus, including the provision of acupuncture (Kim, Lee, Choi, & Ernst, 2010) and the provision of Virgin Coconut Oil (VCO) (Melastuti 2016).

Dry skin that appears in patients with chronic renal failure with hemodialysis is usually caused by atrophy of the sebaceous glands, impaired function of external secretions, and impaired hydration of the stratum corneum. Dry skin in patients with hemodialysis who have pruritus has lower hydration than hemodialysis patients without pruritus complaints (Roswati, 2013).

Dry skin in pruritus is caused by vitamin A retention due to reduced kidney function to excrete substances that are not needed by the body. So that Vitamin A will accumulate in subcutaneous tissue. Too much vitamin will cause atrophy of the sebaceous glands and sweat glands so that the skin becomes dry and itchy.

Virgin Coconut Oil (VCO) is pure coconut oil produced from the processing of coconut meat without heating or through heating at low temperatures so as to produce oil with a clear color and free of free radicals due to heating (Handayani et al, 2011). The content of fatty acids (especially lauric and oleic acids) in VCO has character that can soften the skin. VCO is effectively used as a moisturizer on the skin so it can increase skin hydration and accelerate healing of the skin (Agero & Verallorowell, 2004; Lucida et al, 2008 in Rukmana, 2017).

Virgin coconut oil (VCO) also contains natural moisturizers and contains moderate chain saturated fatty acids that easily enter the inner skin layers and maintain skin elasticity and suppleness. Lauric acid and capric acid contained in virgin coconut oil can kill viruses. In the body, lauric acid is converted into monolaurin; these compounds include monoglyceride compounds that are antiviral, antibacterial, antibiotic and antiprotozo. (Meliyana, 2017). Giving of virgin coconut oil (VCO) aims to prevent injury to the skin due to friction from the massage action. Pure coconut oil has antiseptic effects and is used as an efficient and safe skin moisturizer (Debmandal & Mandal, 2011).

## 2 RESEARCH METHODS

This research was conducted at Grandmed Hospital, located at Jl Raya Medan, No.66, Lubuk Pakam. The research was conducted in February - July 2019. This type of research is a quasi-experimental design with pre-test and post-test two groups. The research sample consisted of 25 people and was divided into 2 groups: group I was given VCO (Virgin Coconut Oil) intervention and Group II was not given VCO intervention but only given a questionnaire with a sample size of 25 people each, with an estimated drop

out of 10% (3 people), then a sample of 27 people in the intervention group and 27 in the control group. When doing research in the course of research in the intervention group died 1 person and in the control group also died 1 person so that the total sample is now 26 for the intervention group and 26 control groups.

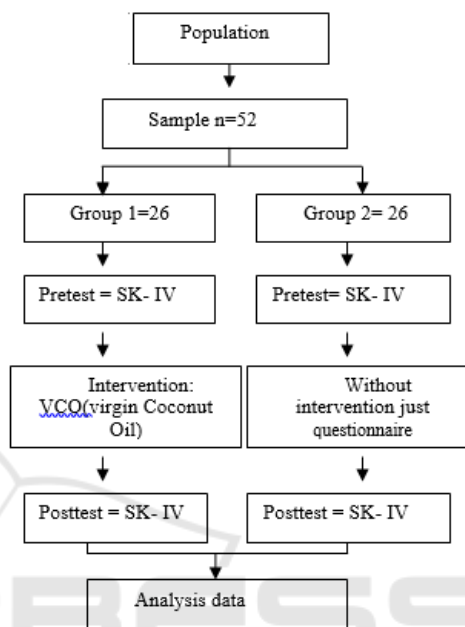


Figure 1: Research groove

In this research, the type of research that used is quasi experimental Design with a non equivalent Pretest-Posttest control group design. The population in the study was all clients of chronic kidney failure with hemodialysis in the hemodialysis room at the Grand Medistra Hospital in Lubuk Pakam in February-July 2019 totaling 198 people. The sample in this study was taken by purposive sampling technique. In this study, the total sample of the study was 52 people with 26 respondents in the control group and 26 respondents in the intervention group.

The instrument which used was a tool to measure skin moisture (SK-IV Digital Moisture for Skin Monitor). Inclusion criteria in this study are: (1) Patients undergoing regular hemodialysis twice a week, (2) Patients have dry skin with a value of 0-35%. The drop out criteria in this research is: (1) Patients die before a post test, (2) Patients who resign during the implementation of the intervention.

Scores that is used to calculate skin moisture from a scale (SK-IV Digital Moisture for Skin Monitor) are dry skin 0-35%, normal skin 36-45%, moist skin that is 46-100%.

The procedures for taking Virgin Coconut Oil (VCO) intervention are

- Introduce yourself and explain the purpose of the Virgin Coconut Oil (VCO) intervention.
- Giving informed consent before taking action.
- Giving SK-IV questioners to the intervention and control groups on the first day pre-test
- The patient was asked to free the skin which will be examined for skin moisture meter from the clothes worn.
- Instruct the patient in a comfortable position
- Put the skin moisture meter on the skin for 6 seconds
- To keep patient's privacy
- Giving of VCO in the intervention group as many as 14x (1 mgg) in the morning and evening as much as 5 cc for each intervention.
- The time that is needed to intervene in the provision of VCO is 20 minutes.
- 10. After completing the intervention, help to use the clothes worn before.

## 2.1 Virgin Coconut Oil (VCO)

Virgin coconut oil is pure coconut oil that is made without heating or with minimal heating. The using of virgin coconut oil as a skin and hair care ingredient has been carried out by Indonesian people for generations. Coconut is a fruit plant that is widely available in Indonesia and is generally used as a food ingredient in the form of processed fresh coconut meat or made oil for cooking and caring for the body. Processed oil from coconut meat consists of 2 types, namely oil which is processed from copra raw material (dried coconut meat) and oil which is processed from raw materials of fresh coconut or coconut milk. Processing of raw materials of fresh coconut produces virgin coconut oil.

How to make VCO: with a mechanical process, in this method, coconut meat is dried quickly and then pressed until the oil comes out. In this way 90% oil and 10% water will be obtained. The water separated from the oil is separated while the water contained in the oil is heated quickly to evaporate.



Figure 2: round coconut



Figure 3: cut the coconut into small pieces



Figure 4: squeeze the coconut



Figure 5: distill coconut milk

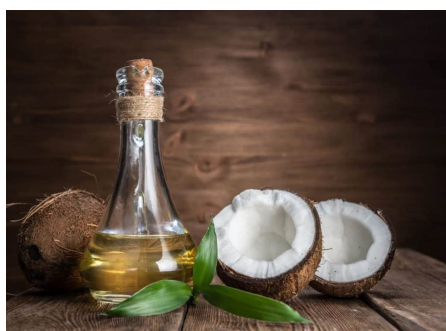


Figure 6: pure coconut oil

## 2.2 Skin Moisture

Skin moisture is a state of moisture in the stratum corneum and a balance between evaporation of water and the ability of the skin to retain water. Skin that has decreased moisture can cause cracks, allowing germs that can cause infections into the body. Skin hydration and mucous membranes help uncover the imbalance of body fluids, changes in the skin environment, and regulation of body temperature.

Skin moisture level can be measured using digital devices which are currently widely used in the beauty and health fields. Skin Moisture Meter FCM1 has the special ability to measure skin's moisture level. In the skin analyzer, has an LCD screen that serves to display data on the measurement of skin moisture. This tool has a design and shape that is small and portable so that it can be carried anywhere. Skin moisture measurement is done in a very short time, that is, within 6 seconds and appears as a percentage figure.

Standard values of moisture to the skin on the arm are: 0-35%: very dry skin, 36-45%: normal skin, 46-100%: moist skin.



Figure 7: Skin Moisture Tool

## 3 RESULTS AND DISCUSSION

### 3.1 Characteristics of Respondents

Distribution of respondent data based on the age of the majority aged 30-45 years in the intervention group amounted to 14 people or 53.8%, while the age of respondents in the control group 46-55 years amounted to 11 people or 42.3%, which is the productive age, where the pattern changes Eat and consume frequent supplement drinks often at this age.

Whereas respondents based on sex in the majority of the intervention group were male, 14 people or 53.8%, and in the majority control group there were 22 people or 84.6%, and in the education group for the intervention group of primary education and education middle school is in the number of 11 people or 42.3%, while in the control group secondary education is in the number of 11 people or 42.3%. In the work of the majority of respondents working as traders in the intervention group as many as 7 people or 26.9%, and in the work control group others as many as 6 people or 23.1% ie respondents who do not work cannot continue their previous work due to health conditions decreased, while the duration of HD 0-5 years in the intervention group was 16 people or 61.5% and in the control group the duration of HD 0-5 years was 23 people or 88.5%. It was caused by habits in consuming foods that contain gout and low habits in consuming drinking water.

Table 1: Characteristics of Respondents

Information	Intervention group		Control group	
	n	%	n	%
<b>Age (years)</b>				
30-45	14	53,8 %	6	23,1%
46-55	6	23,1%	11	42,3%
56-65	6	23,1%	9	43,6%
<b>Total</b>	<b>26</b>	<b>100%</b>	<b>26</b>	<b>100%</b>
<b>Gender</b>				
Laki-laki	14	53,8%	22	84,6 %
Perempuan	12	46,2%	4	15,4%
<b>Total</b>	<b>26</b>	<b>100%</b>	<b>26</b>	<b>100%</b>
<b>Education</b>				
No education	1	3,8%	-	-
Primary education	11	42,3%	10	38,4%
Secondary education	11	42,3%	11	42,3%
Higher education	3	11,5%	5	11,5%
<b>Total</b>	<b>26</b>	<b>100%</b>	<b>26</b>	<b>100%</b>
<b>Occupation</b>				
No	5	19,2%	5	19,2%
Housewife	5	19,2%	2	7,7%



Farmer	3	11,5%	4	15,4%
Trader	7	26,9%	1	3,8%
Teacher	2	7,7%	2	7,7%
Enterpriser	2	7,7%	5	19,2%
Police	1	3,8%	-	-
Civil servant	-	-	1	3,8%
Etc.	1	3,8%	6	23,1%
<b>Total</b>	<b>26</b>	<b>100%</b>	<b>16</b>	<b>100%</b>
<b>Length HD(Tahun)</b>				
<b>0-5</b>	<b>16</b>	<b>61,5%</b>	<b>23</b>	<b>88,5%</b>
<b>6-10</b>	<b>8</b>	<b>30,8%</b>	<b>3</b>	<b>11,5%</b>
<b>&gt;10</b>	<b>2</b>	<b>7,7%</b>	<b>-</b>	<b>-</b>
<b>Total</b>	<b>26</b>	<b>100%</b>	<b>26</b>	<b>100%</b>

### 3.2 The Results of Wilcoxon TEST (Prepost Test) of Skin Moisture in Treatment and Control Groups at RS Grandmed Lubricant

Table 2. The test of Wilcoxon (pre-post test) of skin moisture for treatment and control groups at RSGrandMed Lubricant

	Skin Moisture		<i>P</i> value
	Pretest Mean +_SD	Posttest Mean +_SD	
Intervention group	20,31+-4,84	41,08+-5,95	0,000
Control group	21,96+-5,89	21,12+-4,44	0,557

The data above shows that there is an increase in the mean value in the intervention group after giving the intervention (post test), which is the mean value  $\pm$  SD ( $41.08 \pm 5.95$ ), while the control group shows a decrease in the mean post test value ( $21.12 \pm 4.44$ ). An increase in the mean value in this treatment group showed an increase in skin moisture in chronic renal failure patients undergoing hemodialysis. Wilcoxon test results showed a significant value in the treatment group ( $p = 0,000$ ).

### 3.3 The Effect of VCO Giving on CKF Patients' Skin Moisture

VCO has been done for one week shows significance which means that there is an effect of giving VCO to skin moisture in patients with CRF. This research is in accordance with the results of the study (Evangelista, Casintah, & Villafuerte, 2014) which mentioned the superior effect of VCO that topically applied oils not only coat but also penetrate the skin and have anti-inflammatory activity. VCO has

saturated fat and contains 62% of medium chain fatty acids which may give greater permease. The results of the research (Sukarja, 2016) the administration of cutaneous stimulation and VCO resulted in fatty acids binding to sweat and then coating the surface of the skin so that it can hold water in the stratum corneum so that the skin becomes moist.

In patients undergoing hemodialysis due to chronic renal failure, various skin lesions will appear, and the most common being dry skin. In 100 hemodialysis patients, 79% of patients experience dry skin (Ankudowicz, 2016). Chronic Kidney Failure can cause changes in the sweat glands and oil glands which causes the skin to lose its natural ability to moisturize itself. This condition can also be caused by changes in metabolism in CKF, which are interrelated with fluid volume from patients undergoing dialysis (Perry, Anne Griffin, Potter, Patricia A., Stockert, Patricia A., Hall, 2013).

Virgin Coconut Oil (VCO) is coconut oil obtained from fresh coconut meat through natural processes, without bleaching, without purification and deodorizing. The main component of VCO is medium chain fatty acids, especially about 50% lauric acid. Unlike traditional coconut oil, the process of making VCO does not use high temperature heating so that free radicals do not form unsaturated fatty acids and the natural antioxidant content is not lost. VCO applied to the skin will affect body tissues, especially connective tissue, making the skin moist.

Skin moisture pre-test values in the treatment group and control group of all patients were at a very dry level (100%). Post-test results in the control group, all patients are still at a very dry level, this is because in this group did not get. Some of the usual interventions performed by patients in the control group in dealing with dry skin is by bathing using baby soap or using lotion.

Whereas in the treatment group after being given a VCO intervention for one week, 11 people (42.3%) had normal skin, 9 people (34.6%) had moist skin, and 6 (23%) skin was still very dry. Although 6 people in the treatment group were still at very dry skin level, but when viewed from the raw value, there was an increase in the value of the six people. As many as 17 people after being given an intervention have not been at the level of the skin becomes moist. As many as 11 people who were previously on the level of dry skin to normal skin, there is an increase in value of approximately 20 points. While as many as 6 people remain in dry skin conditions even though there is an increase in value in quantity. This is because the skin moisture value during the pre test is at a very low value ( $<21\%$ ), so to reach the normal

value requires a considerable increase in points. Increasing the value of the six people is approximately 15 points. Skin conditions in each patient are certainly not always the same, several factors that cause these patients are still in the condition of dry skin after one week of intervention due to atrophy of the sebaceous glands associated with decreased lipid surface that causes dehydration of the stratum corneum (Masmoudi 2014). In addition, the length of time a patient undergoes HD can also influence, due to the decrease in sweat glands along with the abnormal function associated with hypervitaminosis A when the patient undergoes dialysis (Ankudowicz, 2018; Mendez, 2015).

It varies in post-test humidity values that appeared in the intervention group did not affect itching in patients. Moisture level of the skin is very dry, normal and moist after one week of intervention, giving the effect of reducing itching on the patient's skin. It shows VCO intervention given can reduce the itching experienced by patients even though the patient's skin is still at a very dry level. The reduction in itching felt by the patient is caused by VCO administration. According to Evangelista's research (2014), VCO can reduce score in Atopic Dermatitis patients, VCO can also moisturize the skin and reduce pruritus scores without giving antihistamines. Pruritus resolution can be explained by concomitant improvement in barrier function on the skin. Disorders of the skin barrier alter epidermal innervation and increase nerve density in the skin.

## 4 CONCLUSION

Based on the results of the statistical tests and the discussion above, it can be concluded that Giving of VCO intervention increases skin moisture in patients with chronic renal failure in the GrandMed Lubuk Pakam Hospital. Through the main components of VCO are Medium Chain Fatty Acids (MCFAs) especially about 50% lauric acid when applied to the skin with a soft and uniform touch, will bind to sweat and coat the surface of the skin by holding water in the stratum corneum.

## 5 SUGGESTION

For hospitals in general, it is hoped that VCO interventions can be complementary therapies to help overcome the problem of dry, itchy skin in other patients except for patients with CKF.

For the next researchers, it is hoped that further research can be measured by measuring ureum creatinine after being given a VCO intervention on the itching experienced by the patient or measuring the endogenous morphine level of the patient related to comfort after being given a VCO intervention.

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