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The Effectiveness of Massage and Virgin Coconut Oil (VCO) Combination Therapy on Reducing Itching in Diabetes Mellitus

Amiruz Zamroni[1], Jon Hafan Sutawardana[2*], Kushariyadi[2], M. Sodikin[3]

1 Faculty of Nursing, University of Jember, Indonesia
2 Department of Medical Surgical Nursing, Faculty of Nursing, University of Jember, Indonesia
3 dr. Soebandi General Hospital, Jember, Indonesia

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Abstract
Diabetic pruritus is a skin complication that is often found in diabetes mellitus patients which is characterized by complaints of itching. One of the complementary therapies that can reduce itching is to do massage and VCO combination therapy. The study aim to analyze the effectiveness of combination massage therapy and VCO to reduce itching in diabetic. This research is a descriptive study using a case study approach. Participant in this study was patient with type II diabetes mellitus with complaints of itchy skin. The intervention was carried out for 3 days of treatment with a frequency of action twice a day in the morning and evening after bathing. The pre-test and post-test were assessed using two instruments including the Overall Dry Skin Score (ODSS) to assess the dryness of the patient's skin and the Itch Numeric Rating Scale (Itch NRS) to assess the patient's itch level. The results showed a decrease in the level of skin dryness from the scale 3 to scale 2 on day 3 of treatment and there was a decrease in the itching scale from scale 7 to scale 4 on day 3 of treatment. Combination therapy of massage and VCO can increase the level of skin moisture as evidenced by a decrease in the level of skin dryness so that it will also reduce the level of skin itching. With these results, it can be considered to make combination massage therapy and VCO as therapeutic modality to overcome the problem of itching in DM patients.

Keywords: Itching, Diabetes Mellitus, Therapy, Virgin Coconut Oil

Correspondence
Jon Hafan Sutawardana,
Faculty of Nursing, University of Jember, Indonesia.
Jl. Kalimantan No.37, Kec. Sumbersari, Kabupaten Jember, East Java 68121
email: afans_agl@yahoo.com

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1. BACKGROUND

Combination therapy of massage and VCO is basically a complementary intervention that can be used as an alternative to non-pharmacological therapy for treating pruritus, which is commonly reported by diabetic patients (Damayanti et al., 2020). Diabetic pruritus is a complication of DM which, if not treated, will have an impact on the patient's quality of life (Cole & Florez, 2020; Yang et al., 2022). This phenomenon was also encountered by researchers when conducting clinical practice in the Gardena

ward at Dr. Soebandi General Hospital of Jember, where there is no optimal management from nurses to make efforts to overcome the problem of patients with itching. In general, the management given by medicine is the administration of pharmacological agents that may have adverse drug side effects on the patient's condition. This makes it a challenge for a nurse to provide safe actions so that patient problems can be resolved (Wijaya et al., 2022).

Based on data from the International Diabetes Federation (IDF), globally it is estimated that as many as 537 million adults aged 20-79 years suffer from DM. 5 million cases (International Diabetes Federation, 2021). In America, the use of VCO as a therapy to reduce the level of skin dryness which can cause itching has been proven empirically. One study stated that the success of therapy using VCO reached 74% of 81 patients who experienced dry skin problems accompanied by itching (Vaughn et al., 2018). In line with these results, research in the Philippines also mentions the effectiveness of using mineral oil therapy, one of which is VCO to improve the skin barrier reaching 69% of a total of 31 respondents (Escuadro-Chin et al., 2019). In Indonesia, many studies empirically prove the use of VCO therapy to treat itchy skin. Research by Dewi et al (2016) which was conducted on 33 DM patient respondents with complaints of itching showed a decrease in the degree of itching after being given VCO 2 times a day. In another research conducted by Daryaswanti (2018) on 26 respondents also gave the result that giving cutaneous stimulation in the form of massage with VCO can increase skin moisture and reduce itching with a distribution of 42.3% in normal degrees and 34.6% in humid degrees.

The pruritic condition that occurs in diabetic patients is influenced by two main factors, namely skin xerosis and diabetic polyneuropathy, which indicates a dermatological and neurological cause of pruritus. These two factors contribute most to the pathogenesis of itching in the adult population with type 2 DM. At the cellular level, insulin is an important growth factor in keratinocyte culture and influences the proliferation, migration, and differentiation of keratinocytes. In addition, increased oxidative stress and neuroinflammation may also play a role in diabetic polyneuropathy. Atypical changes in circulating insulin levels are also a cause of keratinocyte dysfunction. Thus, the abnormal proliferation of keratinocytes in the epidermis alters the hydration status of the stratum corneum in DM patients. In addition, it is known that DM induces an

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increase in non-enzymatic glycosylation (NEG) products in dermal collagen. Normally, NEG occurs during the aging process, but in DM patients it occurs more rapidly. NEG results in the formation of advanced glycation end products (AGEs) which function to reduce the level of acid solubility and enzymatic digestion of skin collagen. Diabetic thick skin and limited joint mobility (LJM) disorders are caused by excess accumulation of AGEs. All of these may be the cause of reduced hydration of the stratum corneum so that the skin becomes dry and itchy. Itching causes an unpleasant sensation that triggers the urge to scratch. Continuous scratching activity results in cell inflammation and the release of histamine by nerve endings which exacerbates the itching sensation. Impaired blood circulation in DM patients causes disruption of tissue circulation and lack of oxygen which causes tissue death. So that if there is excretion of an area on a DM patient's body due to scratching activity, this can get worse resulting in a wound that does not heal (Damayanti et al., 2020; Stefaniak et al., 2021).

Massage therapy is given orientated in the superficial area so that it can stimulate the receptors in the skin. One of the physiological effects of massage is its ability to increase local blood and lymphatic flow, improve nutritional status, facilitate toxin removal, and speed up the healing process. Giving massage to dry skin to prevent injury to the skin can use one of them with Virgin Coconut Oil (VCO). VCO is pure coconut oil that is made without heating. VCO has a high fatty acid content, especially lauric acid, and has a higher phenolic and antioxidant content compared to regular coconut oil. The use of VCO in the massage process causes fatty acids to bind with sweat and then coat the surface of the skin so that it can hold water in the stratum corneum. The retention of water in the stratum corneum reduces the evaporation process so that the skin becomes moist. This moist skin condition has the effect of reducing itching on the skin which makes the patient in a comfortable condition (Daryaswanti, 2018).

Based on the explanation above, it can be seen that it is very important to carry out complementary nursing interventions in the form of a combination of massage therapy and VCO to overcome the problem of itching in DM patients. This is also the basis for researchers to apply this therapy and teach families to increase the knowledge and abilities of the patient's family in carrying out therapy independently following Standard Operating Procedures (SOP) to reduce

itching that patients complain of in the Gardena Ward in dr. Soebandi General Hospital Jember.

2. METHODS

This research is a descriptive study using a case study approach that focuses on a problem using a variety information in data collection. Participant in this study was patient with type II diabetes mellitus with complaints of itchy skin. This study was conducting in Gardena ward of dr. Soebandi General Hospital of Jember.

The intervention in this study was giving massage therapy with VCO. The combination therapy of massage and VCO is carried out 2 times a day, namely in the morning after bathing and at night after bathing. The massage technique used is the stroking technique, namely by massaging in a direction from distal to proximal with a depth that is adjusted to the condition of the tissue and the desired effect. The use of VCO is given as much as 5 ml in each intervention which is evenly distributed over the massaged area. Massage is carried out for 30 minutes to get a therapeutic effect (Sukarja et al., 2018).

The pre-test is carried out before each massage action and the post-test therapy is carried out after a minimum of 6 hours of massage to evaluate the patient's skin moisture level. The instrument used to assess skin moisture was carried out using a subjective observation instrument, namely the Overall Dry Skin Score (ODSS) with a scale of 0-4 (0: no xerosis – 4: large scouma, clear rough skin, redness, and cracks) and for assessing the level of itching felt by the patient using the Numeric Rating Scale (Itch NRS) which has a scale of 1-10 (1: no itching – 10: very annoying itching).

3. RESULTS

Dryness Scale Before and After Implementation

Dryness scale before and after implementation of massage and VCO therapy combination in 3 days, can be seen in the following table.

Table 1. Dryness Scale Before and After Implementation

Time	Day 1		Day 2		Day 3	
	Before	After	Before	After	Before	After
Morning	3	3	3	3	2	2
Evening	3	3	3	2	2	2

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In the table above, the results showed that there was a decrease in the degree of dryness of the skin from scale 3 to scale 2 on day 3 of treatment.

Itching Scale Before and After Implementation

Itching scale before and after implementation of massage and VCO therapy combination in 3 days, can be seen in the following table.

Table 2. Icthing Scale Before and After Implementation

Time	Day 1		Day 2		Day 3	
	Before	After	Before	After	Before	After
Morning	7	7	6	6	5	5
Evening	7	6	6	5	4	4

In the table 2, the results showed that there was a decrease in the degree of itching of the skin from scale 7 to scale 4 on day 3 of treatment.

4. DISCUSSION

Based on the results of the study, the patient's skin dryness scale before receiving therapy was 3, which means the characteristics of the patient's skin dryness were small and large scales uniformly distributed, definite roughness, slight redness and few superficial cracks. Besides that the itching scale felt by the patient before getting therapy was 7 which could be interpreted as a disturbing itch. The incidence of itching in DM patients occurs because the skin experiences dryness due to lack of water content in the stratum corneum. In people with diabetes there is a change in blood glucose levels which can trigger an increase in NEG in dermal collagen. NEG results in irreversible formation of AGEs. Furthermore, because AGEs cannot be reversed, excess buildup occurs in the skin tissue which can cause a decrease in the enzymatic digestion of skin collagen so that the hydration level of the corneum decreases (Desnita & Sapardi, 2020; Stefaniak et al., 2021).

Itchy conditions in DM patients can also be caused by dysfunction of keratinocytes, abnormal proliferation of keratinocytes in the epidermis. Under normal conditions, insulin is one of the factors that influence the growth of keratinocyte cultures, influencing the proliferation, migration and differentiation of keratinocytes. In DM patients, there are atypical changes in circulating insulin levels in the blood resulting in keratinocyte dysfunction in the form of abnormal

proliferation of keratinocytes in the epidermis thereby changing the hydration status of the corneum. As a result of the dryness of this skin layer, patients complain of itching in certain areas (Damayanti et al., 2020; Wijaya et al., 2022).

Based on the research results, the patient's skin dryness scale after receiving therapy on the third day it becomes 2 which means the characteristics of the patient's skin dryness are small scales, several large scales, slight roughness, whitish appearance. It can be concluded that there is a decrease in the degree of dryness of the skin or it can be said that the patient's skin becomes moisture. Also, the itch scale of the patient reduced to a scale of 4 on the 3rd day of treatment. Judging from this result, meaning the combination therapy of massage and VCO is effective in overcoming the problem of itching in diabetic patient at Gardena Ward, dr. Soebandi General Hospital Jember. The results of this study are in line with research of Dewi et al., (2016) who administered VCO to reduce itching in DM patients. In this study VCO administration was also given for 3 days with a frequency of 2 times a day. The results of the research showed that mostly participant experienced a decrease in itching as much as 63.6% on a mild scale.

Light massage therapy with stroking techniques can activate the integration of the body's sensory systems caused by stimulation and activity of the autonomic system. In doing massage to prevent injury to the massage procedure, it is better to use a lubricant. One that can be utilized is VCO which is virgin coconut oil that has gone through some processing. VCO contains saturated fat and oleic acid which are capable of being emollient so that it can have an effect on increasing skin moisture. During the massage process, VCO will bind to sweat which then coats the surface of the skin and holds water in the stratum corneum. The retention of water in the stratum corneum will keep the skin moist and reduce itching on the skin as well (Daryaswanti, 2018; Sukawana et al., 2020; Zuryati, 2019).

5. CONCLUSION

Based on the results of this study, combination therapy of massage and VCO which was carried out for 3 days of treatment in patients with diabetes mellitus was proven to reduce itching experienced by patients. So that combination therapy of massage and VCO can be used as a complementary therapy for

diabetic patient to treat and reduce dryness and itchness skin.

AUTHOR CONTRIBUTIONS

Substantial contributions to conceptualization, data curation, analysis and manuscript revisions: Amiruz Zamroni, Jon Hafan Sutawardana, Kushariyadi, M. Sodikin. Supervision, review and editing: Amiruz Zamroni and Jon Hafan Sutawardana.

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CONFLICT OF INTEREST

The authors declare no conflict of interest for this publication.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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