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DESCRIPTION OF THE CHARACTERISTICS OF PATIENTS WITH CHRONIC KIDNEY DISEASE WITH XEROSIS CUTIS

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Abstract

Cuticular xerosis is a skin disorder that occurs in about 85% of CKD patients with symptoms such as the appearance of small to large scales, cracks, and inflammation. Xerosis cutis appears in CKD patients due to reduced size of the eccrine sweat glands and atrophy of the sebaceous glands. Xerosis cutis, if left untreated, can lead to more serious skin disorders and can affect the quality of life of the sufferer. Topical Gotu Kola can be used as a moisturizer because it contains humectant, emollient, and antioxidant properties. The objective of the study was determining the effect of topical Centella asiatica on dry skin in CKD patients. The type of research was to be carried out is quantitative research with a quasi-experimental design with a total sample of 21 people. The sample was selected using purposive sampling technique. The research instrument used was the Overall Dry Skin Score-Japan (ODSS-J) to assess the dry skin score. Statistical tests using the Wilcoxon test showed a p value of 0.000 (p value ≤ α 0.05) which indicates that there is an effect of topical Centella asiatica administration on dry skin in CKD patients. Thus Centella asiatica topical can be used as an alternative non-pharmacological therapy in overcoming dry skin in CKD patients. There was an effect with a mean value of xerosis cutis before intervention 2.43 and after intervention 1.29.

Keywords : Centella Asiatica, Chronic Kidney Disease, Topical, Xerosis Cutis

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INTRODUCTION

As a global health problem, Chronic kidney disease (CKD) is one of the most common non-communicable diseases. In 2019, WHO reported the number of CKD cases ranked 10th. The death rate due to CKD went from 1.2 people in 2017 to 1.3 million people in 2019. CKD is also one of the leading causes of death in the 21st century (Kovesdy, 2022). The Centers for disease control and prevention (2023) reported that 35.5 million adults in the United States have CKD. Based on data from Profil Kesehatan Indonesia (2021), the number of CKD cases in Indonesia reached 1,322,798 in

2022. According to Kalengkongan et al (2018) manifestations in CKD patients include various systems including the cardiovascular, gastrointestinal, neurological, musculoskeletal and integumentary systems. Symptoms arising from disorders of these systems include hypertension, heart failure, pulmonary edema, nausea and vomiting, ammonia odor breath, difficulty concentrating and can occur fractures due to bone loss due to calcium deficiency or destruction of dihydroxycholecalciferon hormone. Meanwhile, disorders that appear in the integumentary system include xerosis cutis, pruritus, ecchymosis, uremic frost, and other skin infections (Yonathan & Darmawan, 2021). Xerosis cutis occurs in about 85% of patients with CKD. Reduced hydration of the stratum corneum causes xerosis cutis characterized by symptoms such as small to large scales, cracks, and inflammation (Amin et al., 2021). Xerosis cutis that appears in CKD patients is due to the reduced size of eccrine sweat glands and sebaceous gland atrophy (Gagnon & Desai, 2013). Xerosis cutis can increase the risk of infection, slow down the wound healing process, and can affect the patient's quality of life (Dewi, 2019). Topical administration of Centella asiatica as one of the non-pharmacological therapies can reduce the xerosis cutis score. Centella asiatica natural ingredients can be used as moisturizers because they contain humectants, emollients, and antioxidants. Triterpenoid saponins, also known as centelloids, are the main components of Centella asiatica (Fernenda et al., 2023).

MATERIALS AND METHODS

This study was conducted at Harapan and Doa Hospital Bengkulu. The subjects of this study were CKD patients who had xerosis cutis. Sampling was done by purposive sampling in accordance with the research criteria. Inclusion criteria included respondents not currently using certain topical drug therapies such as gabapentin, respondents who underwent hemodialysis regularly for ≥ 1 year, and patients did not experience severe skin diseases such as Acquired Perforating Dermatosis (APD), calciphylaxis, melanoma, and Systemic Lupus Erythematosus (SLE). This study consisted of one group with a total sample size of 21 respondents.

This study is a quantitative research with pre-experimental method using one group pretest and post-test design. Pre-experimental research aims to determine the effectiveness of the independent variable on the dependent variable after intervention. This study aims to determine the effectiveness of Centella Asiatica Topical on xerosis cutis in CKD patients. This research was conducted from March to June 2024. The initial stage carried out is to visit respondents who do dialysis in the hemodialysis room of Harapan and Doa Hospital for an initial pretest of patients who experience xerosis cutis and ask for willingness to become research respondents. Furthermore, the researcher asked for the complete address and made an appointment with respondents who were willing to do a

home visit. The intervention was carried out for 30 days with a frequency of 2 times a day after bathing morning and evening, post-test on day 30.

The measuring instrument used to determine the cutis xerosis score in this study is the Overall Dry Skin Score-Japan (ODSS-J). This research instrument has been calculated validity and reliability with Cronbach's alpha worth 0.939 where the instrument is said to be reliable if it has Cronbach's alpha> 0.60. The instrument consists of a score of 0 to 4, each of which is given a statement according to the severity of xerosis experienced by the patient. score using a 0-3 Likert scale. Data analysis was performed univariately to see the frequency distribution, while bivariate analysis used the Wilcoxon test to see the effectiveness of Centella Asiatica Topical administration on Xerosis cutis in CKD patients. This study has obtained an ethical eligibility letter from the Ethics Committee of Jenderal Achmad Yani University Yogyakarta with the number SKep/72/KEP/III/2024.

RESULTS AND DISCUSSION

Result

The results showed that the average age of the 21 respondents in this study was 53-54 years old with the youngest age being 36 years old and the oldest age being 66 years old. The average length of hemodialysis is 3-4 years with a duration of 1 year and the longest is 7 years. The average duration of xerosis cutis was 32-33 months with the shortest duration of 8 months and the longest duration of 75 months. Most of the respondents were female (52.4%) (Table 1).

Table 1: Characteristics of respondents based on age, duration of hemodialysis, duration of xerosis cutis, and gender (n = 21 respondents)

Variable	Respondents
Respondents age (in year)	
Mean	53.76
Median	54.00
Min	36
Max	66
SD	7.778
CI 95%	50.22-57.30
Duration of hemodialysis (in year)	
Mean	3.05
Median	2.00
Min	1
Max	7
SD	2.202
CI 95%	2.05-4.05
Duration of xerosis cutis (in month)	
Mean	32.57

Median	27.00
Min	8
Max	75
SD	25.188
CI 95%	21.11-44.04
Gender	
Male	10 (47.6%)
Female	11 (52.4%)

Table 2: Overview of cutis xerosis score before and after intervention

No	**Xerosis Pre**	**Xerosis Post**
Mean	2.43	1.29
Median	2.00	1.00
Min	1	1
Max	4	4
SD	0.811	0.463
CI 95%	2.06-2.80	1.08-1.50

Table 2 shows that the mean fatigue score of respondents before the intervention was 2.43 with SD 0.811, with a minimum value of 1 and a maximum value of 4. After the intervention, the mean fatigue score of respondents decreased to 1.29 with SD 0.463 and the data distribution showed a minimum value of 1 and a maximum value of 2 (Table 2).

Table 3: Effectiveness of topical Centella asiatica administration on the level of cutis xerosis in CKD patients

Xerosis cutis score	**Mean**	**Mean Difference**	**SD**	**Asymp. Sig. (2-tailed)**
Before intervention	2.43	1.14	0.811	0.000
After intervention	1.29		0.463	

Based on table 3, it can be seen that the average cutis xerosis score before the intervention was 2.43 with SD 0.811, while the average cutis xerosis score after the intervention was 1.29 with SD 0.463. From the table, it is known that there is a difference in the average postpartum depression risk score before and after the intervention of 1.14 points. The Wilcoxon test was conducted because the data was not normally distributed where H0 was rejected if the p-value <0.05. The Wilcoxon test results as can be seen in the table show a p-value of 0.000 which means H0 is rejected. In conclusion, Centella asiatica topical is effective in reducing xerosis cutis in CKD patients.

Discussion

Respondent Characteristics

The loss of skin function in the elderly is influenced by the aging process and is prone to diseases including: scaly skin, itchy skin, and cracked skin. Xerosis is a picture of dry or rough skin that occurs in 50%-70% of dialysis patients due to loss of water in the corneum layer (outer layer) which causes the skin to become cracked so that it can cause itching, bleeding, and dermatitis (Faizah & Sulastri, 2022). In line with the research of Pranandhira et al (2023) showing the age characteristics of the most respondents (41 people) in the pre-elderly age range (46-55 years).

Characteristics of respondents based on the length of time undergoing hemodialysis in the intervention group 3.05 years and in the control group 2.90 years. In line with the research of Tameezuddin et al (2023), CKD patients who undergo hemodialysis with an average duration of 3 years will experience skin function disorders such as xerosis, pruritus, and skin discoloration / hyperpigmentation. The development of xerosis cutis in patients with CKD is due to dysfunctional sebaceous and apocrine sweat glands. This leads to a decrease in skin lipid levels which threatens skin hydration. Xerosis cutis can also be caused by the accumulation of vitamin A in the body due to the disruption of the kidney's ability to eliminate substances that the body does not need, causing vitamin A to accumulate in the tissues under the skin. Too much vitamin will cause the sebaceous and sweat glands to atrophy, resulting in dry skin (Dwiyana et al., 2023).

The characteristics of respondents based on the length of time experiencing xerosis cutis in the intervention group and control group mostly experienced xerosis cut is after undergoing hemodialysis therapy with an average duration of 32.57 months in the intervention group and 28.67 months in the control group. Based on the research of Rahmi et al (2023), patients who undergo hemodialysis therapy for a long period of time will cause sebaceous gland atrophy, impaired external secretory function, and decreased hydration in the long term. As a result, the skin of patients undergoing hemodialysis will become dry and cracked.

Characteristics of respondents based on gender showed that half of the respondents who suffered from xerosis cutis were female. In the intervention group, there were 11 people (52.4%), while the control group was 12 people (57.1%). Xerosis cutis is more common in women than men. This is because women have thinner skin and cause the skin evaporation process to be higher so that women's skin tends to be drier than men's skin. A German study conducted by Rahrovan et al (2018) showed the level of Stratum corneum hydration in men tends to be higher than women's skin. In addition, the hormonal balance of testosterone, estrogen and progesterone in women and men also plays a role in sebum production. In postmenopausal women, the amount of estrogen produced will

decrease so that the quality of the skin decreases, making it prone to damage and dryness due to decreased collagen in the dermis.

Overview of cutis xerosis score before and after intervention

The results of the analysis of the average cutis xerosis score in the intervention group before being given the intervention were 2.43 and after being given the intervention 1.29. Based on the results of research conducted by Legiawati (2021) conducted at RSCM on 159 respondents, it shows that there is a decrease in the level of xerosis cutis in patients with diabetes mellitus after being given a combination of oral Centella asiatica and topical Centella asiatica so that it can be concluded that there is a significant change between the value of xerosis cutis before and after intervention p = 0.001. The results of this study are in line with research conducted by Nuraini & Rahayu (2021), there was an increase in the average value of stretch marks after being given Centella asiatica topical, it was found that the average value after the intervention was greater than the average value before the intervention, namely 5.25> 1.83 with a difference of 3.42.

Effectiveness of topical Centella asiatica administration on the level of cutis xerosis in CKD patients

The results of research conducted by Legiawati (2021) conducted at RSCM on 159 respondents, showed a decrease in the level of cutis xerosis in patients with diabetes mellitus after being given a combination of oral Centella asiatica and topical Centella asiatica (p = 0.001) so that it can be concluded that there is a significant change between the cutis xerosis value before and after the intervention.

Giving topical lotions such as Centella asiatica is a form of intervention to reduce xerosis scores increase the knowledge of respondents and families in reducing xerosis scores . Physiologically through an increase in aquaporin-3, loricrin and involucrin contributors in keratinocytes and hyaluronan secretion in the skin on madecassoside contained in Centella asiatica shows significant results in increasing skin hydration. The saponin content of Centella asiatica is able to retain water longer in the skin and prevent evaporation of the epidermal layer in the skin (Sari et al., 2023).

Research conducted by (Oktavia et al., 2023) showed that the combination of Centella asiatica topical and Curcuma domestica gel had an effect on the value of stretch marks in post partum mothers (p 0.001). Centella asiatica contains active compounds including triterpenoid saponins, asiaticoside, centelloside, madecassoside and asiatic acid. The content of asiaticoside is an important compound as much as about 84% in its water extract, which functions to induce type I collagen synthesis in fibroblasts so that it can be used to treat stretch marks. The superior content of Centella

asiatica extract is able to moisturize the skin while creating collagen to make the skin elastic so that it can prevent and treat stretch marks.

CONCLUSION

The results showed that the average cutis xerosis score of the intervention group given Centella asiatica topical before the intervention was 2.34 and decreased by an average of 1.29. Based on statistical tests, it was found that there was an effectiveness of topical Centella asiatica administration on the cutis xerosis score in CKD patients. Giving Centella asiatica topical can be used as an alternative non-pharmacological intervention for CKD patients who experience cutis xerosis.

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