COVID-19:
Journal of Health, Medical Records and Pharmacy
https://jurnal.devitara.or.id/index.php/sehat
E-ISSN: 3032-4033 Volume 3 Nomor 1 Tahun 2025

The Effectiveness of Olive Oil Application in Reducing Pruritus and Improving Comfort Among Hemodialysis Patients at Putri Hijau Hospital, Medan

[1]Eka Nugraha V. Naibaho, [2]Mhd Alfi Syahrin Nursanjaya, [3]Edisyah Putra Ritonga, [4]Nataria Yanti Silaban, [5]Yuni Shanti Ritonga, [6]Syahrul Handoko Nainggolan
[1,2,3,4,5,6] Universitas Imelda Medan, Medan, Indonesia

ARTICLE INFO

Keywords:
Hemodialysis;
kidney function;
therapeutic;
Olive Oil;
Pruritus;
Comfort.

ABSTRACT

Hemodialysis is a therapeutic intervention used to replace kidney function when the kidneys are no longer able to perform their physiological roles adequately, and it is initiated when conservative treatment fails to maintain renal function. Uremic pruritus is a commonly used term referring to a dermatological symptom characterized by an itching sensation that provokes the urge to scratch and is highly prevalent among patients undergoing hemodialysis. The administration of olive oil was conducted to evaluate its long-term effect on reducing the severity of pruritus. The objective of this study was to determine the effectiveness of olive oil application in reducing pruritus among hemodialysis patients at Putri Hijau Hospital, Medan. This study employed a pre-experimental design with a one-group pretest–posttest approach. The research was conducted from February to April 2025 at Putri Hijau Hospital, Medan. The total population consisted of 60 patients, and a sample of 37 respondents was selected using purposive sampling. Bivariate analysis was performed using the Wilcoxon signed-rank test. The results showed that on the first day prior to olive oil application, the majority of hemodialysis patients experienced unbearable itching, with 18 respondents (48.6%). On the fifth day after the intervention, the majority of patients reported mild itching, with 19 respondents (51.4%). Based on the Wilcoxon test results, the significance value was less than 0.05, indicating a statistically significant effect. The study findings demonstrate that olive oil application significantly reduced pruritus among hemodialysis patients at Putri Hijau Hospital, Medan, with a two-tailed significance value of 0.000 (<0.05).

Email : Naibahoekanugraha@yahoo.com

INTRODUCTION

Hemodialysis is a therapeutic modality used to replace kidney function when the kidneys are no longer able to perform their physiological roles adequately and is initiated when conservative management fails to preserve renal function (Smeltzer et al., 2010). Hemodialysis is typically performed two to three times per week, with each session lasting approximately four to five hours. The procedure aims to correct fluid imbalance, restore electrolyte balance, remove metabolic waste products, and maintain acid–base balance (pH) within tolerable physiological limits (Black & Hawk, 2014). Patients with end-stage renal disease are required to undergo hemodialysis on a chronic basis (Weiss et al., 2016).

Uremic pruritus is a widely recognized dermatological symptom characterized by an itching sensation that provokes the urge to scratch and is highly prevalent among patients undergoing hemodialysis (Hu et al., 2018; Palareti et al., 2016; Shirazian et al., 2017). This condition is primarily associated with the accumulation of uremic toxins in the body (Pardede, 2016). Patients commonly experience chronic pruritus, defined as itching persisting for more than six months (Weiss et al., 2016). Uremic pruritus most frequently affects the back, face, and arms, with severity ranging from generalized itching to localized and severe forms (Simonsen et al., 2017).

Previous studies have reported a high prevalence of uremic pruritus among hemodialysis patients. Hu et al. (2018) reported a prevalence rate of 55% among hemodialysis patients. In Pakistan, a study conducted in a hemodialysis unit found that 262 out of 354 patients (74%) experienced pruritus, with

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56.5% classified as moderate, 34.4% as mild, and 9.1% as severe (Rehman et al., 2018). Overall, the incidence of uremic pruritus during hemodialysis treatment has been reported to range from 50% to 90% (Ozen et al., 2018).

Similarly, a study conducted in Palembang, Indonesia, involving 90 hemodialysis patients demonstrated varying degrees of pruritus severity. Among male patients, 15.3% experienced mild pruritus, 54.2% moderate, 25.4% severe, and 5.1% very severe pruritus. Among female patients, 19.4% experienced mild pruritus, 29.0% moderate, 32.3% severe, and 19.4% very severe pruritus (Shalini Nadarajah & Inda Astri, 2018).

Various therapeutic approaches have been explored for the management of uremic pruritus, including topical therapy, systemic therapy, and phototherapy. Topical treatments include emollients, which reduce transepidermal water loss (TEWL) and improve the skin barrier with minimal side effects; tacrolimus (a calcineurin inhibitor), which may cause erythema and skin infections; and capsaicin or pramoxine hydrochloride (topical anesthetics), which may cause local burning sensations, unpleasant odor, and cutaneous erythema. Menthol–camphor preparations have also been reviewed as topical agents to relieve irritation with minimal adverse effects (Westby et al., 2020). In addition to topical applications aimed at skin rehydration, systemic therapies such as gabapentin and pregabalin have been shown to reduce itching in uremic pruritus. Furthermore, ultraviolet B (UVB) phototherapy has been reported to be effective in decreasing pruritus intensity (Mettang, 2016).

The administration of olive oil for two weeks was undertaken to evaluate its long-term effect on reducing the pruritus scale. Although there is limited scientific consensus regarding the optimal duration of topical application, previous studies have implemented varying intervention periods. For instance, Muliani et al. (2021) applied olive oil for one month, Toruan (2019) administered oat lotion for two weeks, and Karadag et al. (2014) conducted their intervention over one month.

Preliminary survey data obtained from Putri Hijau Hospital, Medan, indicated that five hemodialysis patients experienced itching as a side effect of dialysis treatment. Based on these findings, the researchers were motivated to investigate the effectiveness of olive oil application in reducing pruritus and improving comfort among hemodialysis patients at Putri Hijau Hospital, Medan.

METHODS

This study employed a pre-experimental design using a one-group pretest–posttest approach, in which a single group of subjects was measured before and after the intervention. The difference between the two measurements was considered the effect of the treatment (Saryono, 2010). The research preparation was conducted from November 2024 to April 2025. The study was carried out in the hemodialysis unit of Putri Hijau Hospital, Medan. The population consisted of all patients with chronic kidney disease undergoing hemodialysis at Putri Hijau Hospital, totaling 60 individuals.

The sample comprised patients with chronic kidney disease undergoing hemodialysis at Putri Hijau Hospital, Medan. A purposive sampling technique was applied, in which participants were selected based on predetermined inclusion and exclusion criteria established by the researchers. The sample size was calculated using the Slovin formula, resulting in a total of 37 respondents. Bivariate data analysis was conducted to determine the significance of the effect between the independent variable (olive oil application) and the dependent variable (pruritus level). The Wilcoxon signed-rank test was used to analyze differences between pretest and posttest measurements.

RESULTS AND DISCUSSION

Results

Table 1 presents the frequency distribution of the demographic characteristics of hemodialysis patients included in this study.

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Table 1. Frequency Distribution of Hemodialysis Patients' Characteristics

Characteristics	n	(%)
Age (years)		
35–40	11	29.7
45–50	14	37.9
51–55	12	32.4
Total	**37**	**100**
Gender		
Male	23	62.2
Female	14	37.8
Total	**37**	**100**
Education Level		
Primary School	21	56.8
Junior High School	9	24.3
Senior High School	5	13.5
Higher Education	2	5.4
Total	37	100
Occupation		
Laborer	19	51.4
Self-employed	8	21.6
Civil Servant	5	13.5
Others	5	13.5
Total	**37**	**100**

Based on Table 1, the majority of respondents were aged 45–50 years, comprising 14 individuals (37.9%). Regarding gender distribution, most respondents were male, accounting for 23 individuals (62.2%). In terms of educational background, the majority had completed primary school, totaling 21 respondents (56.8%). Concerning occupation, most hemodialysis patients were employed as laborers, with 19 respondents (51.4%).

Table 2 presents the frequency distribution of pretest pruritus scores among hemodialysis patients from day 1 to day 5 prior to the administration of olive oil.

Table 2. Frequency Distribution of Pretest Pruritus Scores

Data	n	(%)
Day 1		
Score 0: Normal / No itching	–	–
Score 1–3: Mild itching	2	5.4
Score 4–7: Moderate itching	17	46.0
Score 8–10: Unbearable itching	18	48.6
Total	37	100
Day 2		
Score 0: Normal / No itching	–	–
Score 1–3: Mild itching	2	5.4
Score 4–7: Moderate itching	17	46.0
Score 8–10: Unbearable itching	18	48.6
Total	37	100
Day 3		
Score 0: Normal / No itching	1	2.7

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Score 1–3: Mild itching	7	18.9
Score 4–7: Moderate itching	13	35.1
Score 8–10: Unbearable itching	16	43.3
Total	37	100
Day 4		
Score 0: Normal / No itching	4	10.8
Score 1–3: Mild itching	14	37.8
Score 4–7: Moderate itching	10	27.1
Score 8–10: Unbearable itching	9	24.3
Total	37	100
Day 5		
Score 0: Normal / No itching	9	24.3
Score 1–3: Mild itching	17	46.0
Score 4–7: Moderate itching	7	18.9
Score 8–10: Unbearable itching	4	10.8
Total	37	100

Based on the table, on the first day before olive oil application, the majority of patients experienced unbearable itching (score 8–10), with 18 respondents (48.6%). Similarly, on the second day, most patients continued to report unbearable itching, accounting for 18 respondents (48.6%). On the third day, the highest proportion of respondents also experienced unbearable itching, with 16 individuals (43.3%). On the fourth day, the majority of patients reported mild itching (score 1–3), totaling 14 respondents (37.8%). By the fifth day prior to the intervention, most respondents experienced mild itching, with 17 individuals (46%).

Table 3 presents the frequency distribution of posttest pruritus scores among hemodialysis patients from day 1 to day 5 following the administration of olive oil.

Table 3. Frequency Distribution of Posttest Pruritus Scores

Data	n	(%)
Day 1		
Score 0: Normal / No itching	–	–
Score 1–3: Mild itching	2	5.4
Score 4–7: Moderate itching	17	46.0
Score 8–10: Unbearable itching	18	48.6
Total	37	100
Day 2		
Score 0: Normal / No itching	–	–
Score 1–3: Mild itching	2	5.4
Score 4–7: Moderate itching	17	46.0
Score 8–10: Unbearable itching	18	48.6
Total	37	100
Day 3		
Score 0: Normal / No itching	1	2.7
Score 1–3: Mild itching	7	18.9
Score 4–7: Moderate itching	13	35.1
Score 8–10: Unbearable itching	16	43.3
Total	37	100
Day 4		

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Score 0: Normal / No itching	4	10.8
Score 1–3: Mild itching	14	37.8
Score 4–7: Moderate itching	10	27.1
Score 8–10: Unbearable itching	9	24.3
Total	37	100
Day 5		
Score 0: Normal / No itching	9	24.3
Score 1–3: Mild itching	17	46.0
Score 4–7: Moderate itching	7	18.9
Score 8–10: Unbearable itching	4	10.8
Total	37	100

Based on Table 3, on the first day after olive oil administration, the majority of hemodialysis patients experienced unbearable itching, with 18 respondents (48.6%). On the second day after the intervention, most patients continued to report unbearable itching, accounting for 16 respondents (43.3%). On the third day, the majority of patients reported mild itching, totaling 14 respondents (37.8%). On the fourth day, most respondents experienced mild itching, with 17 individuals (46%). By the fifth day after olive oil application, the majority of patients reported mild itching, comprising 19 respondents (51.4%).

Table 4. The Effect of Olive Oil Application on the Reduction of Pruritus Among Hemodialysis Patients at Putri Hijau Hospital, Medan

Pre- and Post-Intervention Olive Oil Application Technique		
Variable	**M**	**SD**
Pre	17.1081	2.94188
Post	27.0400	2.82076

Table 4 presents the mean (M) and standard deviation (SD) values of pruritus scores before and after the olive oil intervention. The results indicate that the mean pre-intervention score was 17.1081 (SD = 2.94188), while the mean post-intervention score was 27.0400 (SD = 2.82076), demonstrating a difference in pruritus scores following the administration of olive oil.

Table 5. Reduction of Pruritus – Olive Oil Application

Ranks

		N	Mean Rank	Sum Of Ranks
Reduction of Pruritus – Olive Oil Application	Negative Ranks	15[a]	8.00	120.00
	Positive Ranks	0[b]	.00	.00
	Ties	16[c]		
	Total	41		

a. Reduction of pruritus < olive oil application
b. Reduction of pruritus > olive oil application
c. Reduction of pruritus = olive oil application

Table 6. Wilcoxon Signed-Rank Test

	Reduction of Pruritus – Olive Oil
Z	-3.873[a]
Asymp. Sig. (2-tailed)	.000

a. Based on positive ranks
b. Wilcoxon Signed Ranks

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Based on Table 6, the results show that:

a. Negative ranks indicate a reduction in pruritus scores from pretest to posttest.
b. Positive ranks indicate no increase in pruritus scores from pretest to posttest.
c. Ties indicate equal values between pretest and posttest scores.

The Wilcoxon test results demonstrated statistical significance at $p < 0.05$. Therefore, it can be concluded that olive oil application had a significant effect on reducing pruritus among hemodialysis patients at Putri Hijau Hospital, Medan, with a two-tailed significance value of 0.000 (< 0.05).

Discussion

According to Pardede (2016), uremic pruritus is a form of itching that occurs in patients with renal failure due to the accumulation of uremic toxins, with a prevalence ranging from 20% to 50%. Pruritus may be generalized or localized, with varying intensity and distribution depending on the severity of the condition. The intensity ranges from mild, sporadic itching to severe itching that interferes with rest both during the day and at night. Uremic pruritus can disrupt daily activities and work performance, impair sleep quality, and ultimately reduce overall quality of life.

From a psychological perspective, olive oil therapy represents a non-pharmacological alternative intervention that may reduce tension, improve circulation, alleviate itching, and promote relaxation during its application (Santoso, 2018). The application of olive oil to specific areas of the body—particularly to pruritic regions—has demonstrated that itching and skin dryness decreased following the intervention. Olive oil can be applied for approximately 15 minutes, twice daily, in the morning and evening.

The use of olive oil to manage pruritus in patients with kidney disease represents a follow-up to recommendations from previous studies (Shirazian et al., 2017). The findings of the present study provide evidence that olive oil, as an emollient, is effective in reducing pruritus severity among patients with chronic kidney disease.

These findings are consistent with the study by Ariyani et al. (2020), which reported a significant difference in pruritus levels among chronic kidney disease patients undergoing hemodialysis after olive oil administration. Similarly, Pele and Waluyo (2019) demonstrated that olive oil application may help prevent the risk of impaired skin integrity in patients with chronic diseases.

This evidence supports the theoretical benefits of olive oil in managing skin disorders by enhancing skin hydration and elasticity, thereby reducing pruritus in patients with chronic kidney disease (Ichihashi et al., 2018). Olive oil is derived from the extraction of olives and contains linoleic acid, which is beneficial for skin health, particularly in addressing conditions such as scaling, eczema, and dry skin (Lin et al., 2018). As suggested in prior research (Shirazian et al., 2017), olive oil as an emollient can be considered an effective complementary therapy to reduce pruritus severity in patients with chronic kidney disease.

CONCLUSION

Prior to the administration of olive oil, the majority of hemodialysis patients experienced unbearable itching, with 18 respondents (48.6%). After the intervention, most patients reported mild itching, accounting for 19 respondents (51.4%). The results of the Wilcoxon signed-rank test indicated statistical significance at $p < 0.05$. Therefore, it can be concluded that olive oil application had a significant effect on reducing pruritus among hemodialysis patients at Putri Hijau Hospital, Medan, with a two-tailed significance value of 0.000 (< 0.05).

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