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Non-Pharmacological Therapy In Overcoming Uremic Pruritus In Hemodialysis Patients: Systematic Review

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Abstract

Introduction: Uremic pruritus or Chronic Kidney Disease-associated Pruritus (CKD-aP) is a common complication in hemodialysis patients, with a prevalence of 30-70%. Uremic pruritus substantially affects patients' quality of life, and non-pharmacological approaches can offer complementary options to medical therapy. Objective: This systematic review aims to identify and evaluate non-pharmacological therapeutic interventions in reducing the intensity of uremic pruritus in hemodialysis patients. Methods: The systematic review used the PRISMA 2020 guidelines. Databases used in the search for articles with RCT designs consisted of EBSCO, PUBMED, ProQuest, CINAHL, and Wiley using relevant keywords based on the topic and title of the study. Article selection used the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) diagram method, with a total of 4,127 articles obtained. 5 articles were obtained according to the inclusion criteria and analyzed descriptively and narratively and have fulfilled the quality review using the JBI (Joanna Briggs Critical Appraising Methodology) guidelines. Results: 5 research articles with non-pharmacological therapeutic interventions consisting of topical Anethum Graveolens oil, topical Sweet Almond oil, topical violet oil, acupressure and auricular pressure, which showed a decrease in the severity of uremic pruritus. Conclusion: These non-pharmacological interventions were proven effective in reducing uremic pruritus in hemodialysis patients and have the potential to be a safe and easy-to-implement therapy in nursing practice. These findings indicate the potential role of non-pharmacological interventions as supportive therapy, but further research with a more rigorous design and larger sample size is needed to comprehensively confirm the effectiveness and safety.

Keywords: Chronic Kidney Disease–Associated Pruritus (CKD-aP), Uremic Pruritus, Hemodialysis, Non-Pharmacological Therapy, Systematic Review

INTRODUCTION

In 2023, an estimated 788 million adults worldwide will be living with CKD, more than double the 1990 estimate (approximately 378 million) [1]. In Indonesia, the prevalence of CKD is 638,178 cases, indicating that CKD also represents a significant public health challenge at the national level [2].

As the disease progresses and the need for renal replacement therapy increases, CKD patients undergoing hemodialysis often experience complications, one of which is uremic pruritus [3]. This condition is characterized by chronic itching unexplained by other dermatological causes, can be localized or generalized, and is generally diagnosed through a subjective diagnosis and assessment of the patient's symptoms [4].

The prevalence of pruritus in hemodialysis patients is reported to be high, with rates varying between 30-70% [5]. Uremic pruritus (UP) has a significant clinical impact, strongly associated with poor quality of life, sleep disturbances, depression, and increased mortality [6]. Therefore, uremic pruritus is an important component of

comprehensive hemodialysis patient care.

The pathophysiology of uremic pruritus is multifactorial: systemic factors (chronic inflammation, uremic metabolite disorders), nerve receptor dysregulation, electrolyte imbalances and immune mediators, and skin factors (xerosis/impaired barrier function) all contribute. Although some pharmacological therapies have demonstrated effectiveness, the need for non-pharmacological approaches remains significant, both as complementary therapies to reduce symptoms and drug side effects, and when access to certain medications is limited. Therefore, recent guidelines and reviews recommend a stepwise approach, including non-pharmacological interventions as part of a comprehensive management strategy [4]. Non-pharmacological interventions have an important role as supportive therapies that are relatively safe, easy to implement, and appropriate for nursing practice.

Various non-pharmacological interventions have been reported in the literature, such as the use of emollients/topicals, phototherapy, acupuncture/acupressure therapy, modification of dialysis parameters, and aromatherapy or other supportive modalities [7]. However, the available evidence still shows varying and heterogeneous results. This situation creates an evidence gap that requires a systematic review to summarize, assess the methodological quality, and evaluate the effectiveness of non-pharmacological interventions in the management of uremic pruritus in hemodialysis patients. Therefore, a systematic review that specifically focuses on non-pharmacological interventions is needed to assess the quality of the evidence and summarize their effectiveness in reducing the intensity of uremic pruritus in hemodialysis patients.

METHODS

The writing method used by the researchers in this study was a systematic review using narrative descriptive analysis of several key findings from research articles discussing the effects of several complementary therapies in managing uremic pruritus in CKD patients undergoing hemodialysis. This systematic review was written based on specific PRISMA diagram guidelines, often used in systematic review writing. The authors used PRISMA as a standard for reviewing and selecting research articles. The PRISMA guidelines are an instrument intended to assist authors in improving the quality of research article selection in a systematic review, which consists of four stages [8].

Furthermore, the standards for conducting the study or analysis of research articles in this systematic review also used the PICO model, which consists of population, intervention, comparison, and outcome. The PICO model was used by the researchers to determine inclusion and exclusion criteria in this systematic review. The criteria determined by the researchers can assist in selecting research articles.

Inclusion and Exclusion Criteria

Table 1. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
The population or sample in the research article focuses on CKD patients.	The population or sample of the article is not CKD patients.
The intervention used in the research article is complementary therapy.	Articles that do not use complementary therapy interventions
Articles focused on CKD patients	Articles that do not focus on CKD

Articles published from original sources	Articles in the form of literature reviews, systematic reviews and case reports
RCT	Qualitative research, cross sectional study, case study, systematic review and meta analysis
Articles published between 2015-2025 and full text	Research articles published before 2015
Article in English	Article not in English

Sources of Information

This systematic review used international electronic databases including EBSCO, PUBMED, ProQuest, CINAHL, and Wiley, with publication dates ranging from 2015 to 2025 (the last 10 years).

Search Strategy

The search strategy used in this systematic review utilized several keywords used in searches within the databases used. The keywords used by the researchers were tailored to the topic and title of the study using standard Boolean operators and equivalent words from the Medical Heading Subject (MeSH) list. The keywords used were "complementary therapy" OR "nonpharmacologic therapy" AND "uremic pruritus" OR "chronic kidney disease" AND "hemodialysis patients" OR "end-stage renal." These keywords were then entered into the search box within the electronic database and filtered according to the following criteria: full-text, published between 2015 and 2025, in English, with the subject criteria being complementary therapy and uremic pruritus.

Article Selection

The research article selection process in this systematic review uses the PRISMA method, consisting of four stages, as illustrated in Figure 1. The first stage is identification, where the author combines research articles from all search sources in the database. The second stage is screening. In this stage, the author selects articles based on their titles, which align with the inclusion criteria. Titles deemed to meet the inclusion criteria are included, while those deemed not are excluded. The third stage is eligibility, where the author selects articles based on their abstracts, which align with the inclusion criteria. Abstracts that meet the inclusion criteria are included, while those that do not meet the criteria are excluded. The fourth stage is inclusion. In this stage, the author again selects the full text, while still adhering to the inclusion criteria and assessing the quality of each research article. This ensures that research articles are truly appropriate and relevant to the research topic and title for systematic review.

Quality Appraisal

The methodological quality of the articles in this systematic review was assessed using the JBI Critical Appraisal Checklist. The JBI Critical Appraisal is an instrument used to assess the methodological quality of a study and to determine the extent to which a study has addressed potential bias in its design, intervention, and analysis [9]. The JBI Critical Appraisal instrument is also adapted to the type of research used, namely the JBI Critical Appraisal for Randomized Controlled Trials.

Data Extraction

In this systematic review, data extraction was designed to provide information from records tailored to the research objectives. Data extracted from each article selected using the PRISMA method included the author, year of publication, journal, country, article title,

study objectives and population, study design, intervention, validity and reliability values of the instruments used, statistical tests used, and study results. The results of the data extraction can be seen in Table 2.

RESULTS

Search Results

Based on the article search flowchart or PRISMA diagram, the identification stage yielded 4,127 articles from several databases. The following details were used: 677 articles from EBSCO, 988 from PUBMED, 1,207 from ProQuest, 683 from CINAHL, and 1,255 from Wiley. In the second stage, the screening stage, article titles were reviewed and 3,820 articles met the inclusion criteria. In the third stage, the eligibility stage, 38 full-text articles were reviewed and 33 were excluded due to not meeting the inclusion criteria. In the fourth stage, the inclusion stage, five articles met the inclusion criteria and were included in the systematic review. These five articles share the same goal: reducing the intensity of uremic pruritus in hemodialysis patients.

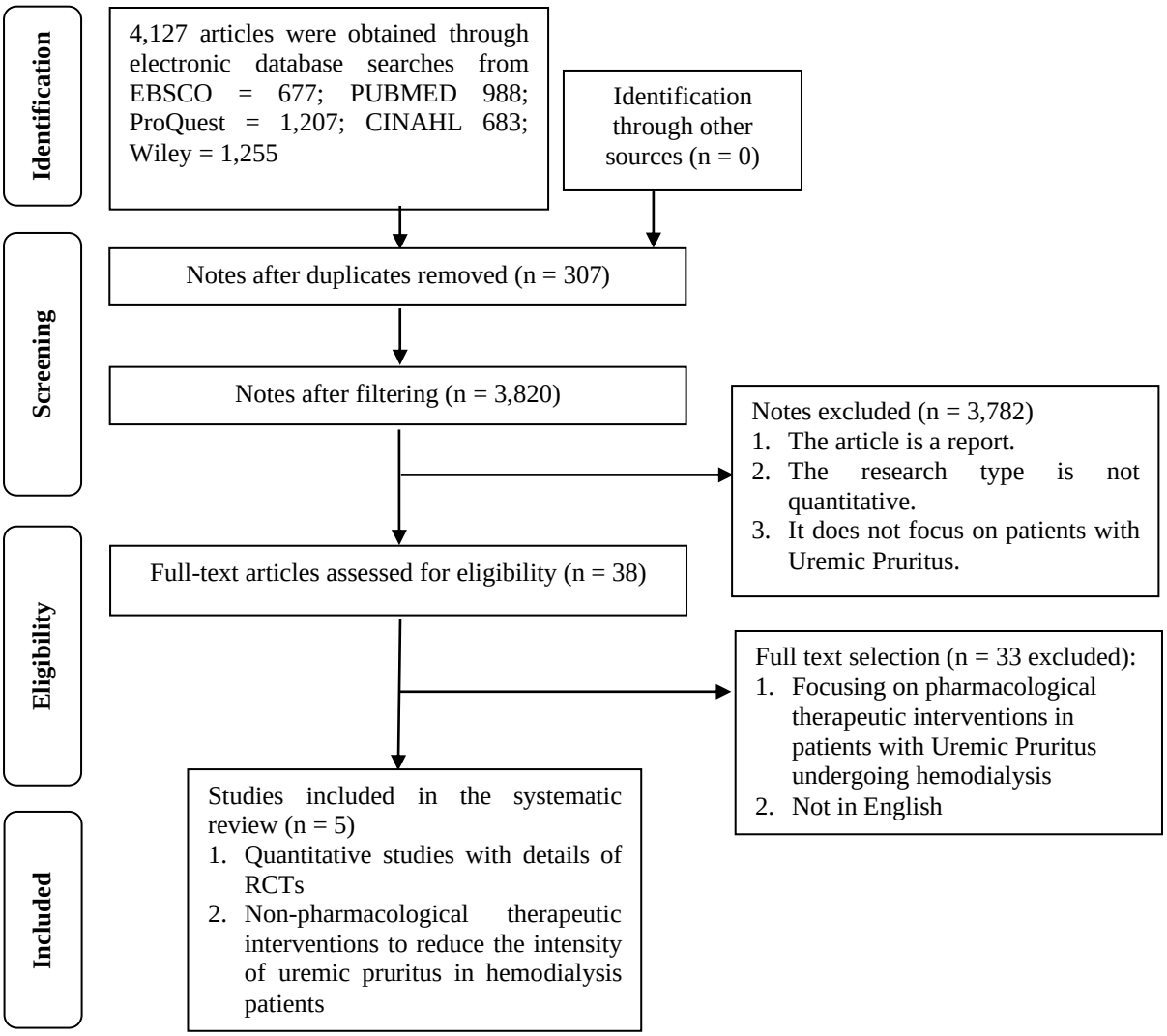

Figure 1. PRISMA Flow Diagram

Table 2. Summary of Data Extraction Results

Author	Title	Objective	Study Design	Population	Instruments	Statistic Test	Result	Country
Zeinab Shaki, Farzaneh Ghaffari, FatemehAlijanih, Mohammad Kamalinejad, Anoshiravan Kazemneja, Babak Daneshfard, Mohsen Naseri and Mohammad Reza Heidari	Effect of Dill (Anethum graveolens) Oil on Pruritus and Quality of Life of Hemodialysis Patients: A Randomized Double-Blind Three Arm Controlled Trial	To test the efficacy of topical application of Anethum Graveolens oil on the severity of pruritus, dry skin, sleep quality, and quality of life in patients undergoing hemodialysis	RCT (double blinded)	The research sample consisted of 111 patients (37 intervention group, 37 control group, 37 placebo group)	Duo's Uremic Pruritus Severity Scale, Itch severity using VAS, Pittburgh Sleep Quality Index	ANOVA	Anethum Graveolens oil can effectively reduce itching and dry skin in hemodialysis patients and thus improve their sleep quality and quality of life	Iran
Fatemeh Karjalian, Marzieh Momennasab	The effect of acupressure on the severity of pruritus and laboratory parameters in patients undergoing hemodialysis: A randomized clinical trail	To determine the effect of acupressure on the severity of pruritus pain and several laboratory parameters in patients	RCT	The research sample was 90 people (30 intervention group, 30 sham/placebo group, 30 control group)	The severity of pruritus is measured using the Numeric Rating Scale (NRS), a 10-point scale: 0 (no itching) to 10	ANOVA	The results of this study reported that acupressure applied to points SP6, SP10, ST36 and LI11 can significantly reduce the	Iran

		undergoing hemodialysis			(unbearable itching)		severity of uremic pruritus in hemodialysis patients	
Ali Khorsand, Roshanak Salari, Mohammad Reza Noras, Azadeh Saki, Jamshid Jamali, Farzenah Sharifipour, Seyed Jamal Mirmoosavi, Seyed Majid Ghazanfari	The effect of massage and topical violet oil on the severity of pruritus and dry skin in hemodialysis patients: A randomized controlled trial	To evaluate body massage with and without violet oil in the treatment of uremic pruritus	RCT	Research sample 57 people	The severity of pruritus was measured using the Dry Scale and Visual Analog Scale	t-test and independent t-test	The results of this study indicate that massage with violet oil is effective as a complementary treatment for patients with uremic pruritus	Iran
Ardashir Afrasiabifar, Zahra Mehri, dan Nazafarin Hosseini	Efficacy of Topical Application of Sweet Almond Oil on Reducing Uremic Pruritusin Hemodialysis Patients: A Randomized Clinical Trial Study	To test the effect of sweet almond oil application in reducing pruritus in hemodialysis patients	RCT	The research sample was 44 (22 intervention group, 22 control group)	The questionnaire used in this study was designed by Duo and modeled after the Yosipovitch questionnaire to assess	ANOVA	Topical application of sweet almond oil has been shown to reduce uremic pruritus in hemodialysis patients	Iran

					uremic pruritus			
Cui-na Yan, Wei-guo Yao, Yi-jie Bao, Xiao-jing Shi, Hui Yu, Pei-hao Yin, dan Gui-zhen Liu	Effect of Auricular Acupressure on Uremic Pruritus in Patients Receiving Hemodialysis Treatment: A Randomized Controlled Trial	To determine the effectiveness of auricular acupressure therapy on pruritus in hemodialysis patients	RCT	Research sample 62 people (Intervention group 32 people, control group 30 people)	Pruritus score was assessed using VAS score	ANCOVA	The results of this study indicate that auricular acupressure is effective in reducing the frequency and severity of uremic pruritus associated with hemodialysis and improving quality of life.	Tiongkok

Study Design

The five articles in this systematic review are described as using RCT research designs.

Respondent Characteristics

The five articles reviewed had a total of 364 respondents in complementary therapies. The largest number of respondents was found in articles with RCT designs, with 111 respondents. The average age of respondents in these five articles was >18 years. The studies were conducted in several countries, including four studies in Iran and one study in China.

Intervention Characteristics

The complementary therapy interventions presented in these five articles comprise several types of interventions. A study used topical Anethum Graveolens oil as a complementary therapy that reduced the severity of pruritus, dry skin, sleep quality, and quality of life in patients undergoing hemodialysis [10]. A study used acupressure in hemodialysis patients experiencing pruritus [11]. A study used violet oil in the treatment of uremic pruritus [12]. A study used sweet almond oil as a complementary therapy that reduced the severity of pruritus [13]. A study used auricular acupressure as a complementary therapy to reduce pruritus in hemodialysis patients [14].

Quality Assessment of Articles

Table 3. Results of Article Quality Assessment for the Systematic Review Using JBI Critical Appraisal Tools

Citation	Criteria													Results	Overall Risk of Bias
	1	2	3	4	5	6	7	8	9	10	11	12	13		
RCT:															
1	√	√	√	√	√	√	√	√	√	√	√	√	√	13/13 (100%) (Good quality)	Low risk
2	√	√	√			√	√	√	√	√	√	√	√	11/13 (84,6%) (Good quality)	Low-moderate risk
3	√		√			√	√	√		√	√	√	√	9/13 (69,2%) (Good quality)	Moderate risk
4	√		√				√	√		√	√	√	√	8/13 (61,5%) (Quality is sufficient)	Moderate risk
5	√		√				√	√	√	√	√	√	√	9/13 (69,2%) (Good quality)	Moderate risk

Quality Assessment of Articles

The results of the quality assessment of the research articles in this study can be seen in Table 3 above. From the five articles designed with RCTs, two articles were of good quality, one article of good quality, where 13 of the 13 questions were answered "Yes," and one article of good quality, where 11 of the 13 questions were answered "Yes." The other three RCT articles were of adequate quality. The results of the quality assessment of the research articles can minimize the risk of bias that occurs in the writing of this systematic review.

Risk of Bias

Based on mapping the JBI results against the Cochrane Risk of Bias domains (Table. 3), one study demonstrated an overall low risk of bias, while the other four studies were categorized as low to moderate. The risk of selection and reporting bias was generally low. However, most studies demonstrated a moderate risk of performance and detection bias due to limited blinding, a common methodological challenge in non-pharmacological interventions.

DISCUSSION

The results of this systematic review indicate that non-pharmacological therapies are effective in reducing the severity of uremic pruritus in patients undergoing hemodialysis. Most of the studies analyzed used a randomized controlled trial (RCT) design with a comparison group, providing a good level of internal validity and strengthening the reliability of the findings. Significant differences between the intervention and control groups indicate that non-pharmacological interventions have a clinically meaningful effect in managing uremic pruritus.

Topical therapies based on natural oils, such as dill oil, sweet almond oil, and violet oil, consistently show a reduction in pruritus severity compared to control groups [13];[12];[10]. The effectiveness of these therapies is thought to be related to improved skin hydration and epidermal barrier function, given that xerosis is a major contributing factor to uremic pruritus [15]. The emollient and anti-inflammatory properties of herbal oils play a role in reducing local inflammation and increasing skin moisture, thereby reducing itching. In addition, reduced pruritus also contributes to improving the quality of sleep in patients [10].

Acupressure and auricular acupressure interventions have also shown significant effectiveness in reducing the severity of pruritus [11]; [14]. Stimulation of specific acupressure points is thought to influence nervous system regulation through endorphin release and autonomic nervous system modulation, thereby reducing the perception of itch . Furthermore, patient involvement in self-administering auricular acupressure has the potential to improve self-care skills and symptom control, ultimately positively impacting the quality of life of hemodialysis patients.

From a nursing theory perspective, the findings of this systematic review align with Kolcaba's Comfort Theory [17]. Reduced pruritus and improved sleep quality reflect increased physical comfort, which can subsequently impact psychological aspects and overall well-being. In addition, the results of this study are also relevant to Orem's Self-Care Deficit Theory, where non-pharmacological therapies such as topical oil application and acupressure can be taught as a form of nursing intervention to support patients' self-care abilities in managing symptoms of chronic diseases.

The clinical implications of this systematic review indicate that non-pharmacological complementary therapies can be integrated as supportive interventions in holistic nursing care for

hemodialysis patients. Nurses play a strategic role in providing education, safely implementing interventions, and evaluating patient responses to therapy. This approach aligns with the principles of evidence-based nursing practice and has the potential to improve patients' quality of life.

However, several limitations should be considered, including variations in pruritus measurement instruments, differences in intervention duration and frequency, and relatively small sample sizes in some studies. Therefore, further research with larger-scale RCT designs and standardized intervention protocols is needed to strengthen the scientific evidence regarding the effectiveness of complementary therapies in managing uremic pruritus.

Implications For Practice

The results of this systematic review suggest that non-farmachologis therapy interventions such as topical application of Anethum Graveolens oil, topical application of Sweet Almond oil, topical violet oil, acupressure, and auricular acupressure may be recommended to reduce the severity of uremic pruritus in hemodialysis patients. These acupressure and auricular pressure treatments should be performed by experienced professionals.

CONCLUSION

This systematic review study has identified that non-farmachologis therapies such as topical Anethum Graveolens oil, topical Sweet Almond oil, topical violet oil, acupressure, and auricular pressure can reduce the severity of uremic pruritus in hemodialysis patients.

The findings of this review indicate the need for further research with blinding, a control group, and a larger sample size. Future research should also explore various non-pharmacological therapeutic interventions to determine the most effective method and optimal duration of its effect on uremic pruritus in hemodialysis patients.

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