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Effectiveness of Peppermint Aromatherapy on Post-Hemodialysis Nausea in Chronic Kidney Disease (CKD) Patients

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Abstract: Chronic Kidney Disease (CKD) is a progressive chronic disease that requires long-term hemodialysis; however, this procedure often causes post-hemodialysis nausea, which may interfere with patient comfort, nutritional intake, and quality of life. This study aims to analyze the effectiveness of peppermint aromatherapy in reducing nausea intensity among CKD patients after hemodialysis. This study used a qualitative descriptive method with a case study approach involving two CKD patients undergoing hemodialysis in the Bromo Ward of a Regional General Hospital in Malang City on April 14, 2026. Nausea intensity was measured using the Nausea Severity Scale (NSS) before and after the intervention. The aromatherapy intervention was administered by applying three drops of peppermint essential oil to a folded tissue, which was then inhaled for 10 minutes after the patients returned to the ward following hemodialysis. The results showed a decrease in NSS scores in both patients, namely Mrs. Y from 8 to 4 and Mrs. M from 8 to 3. These findings indicate that the menthol content in peppermint may provide gastrointestinal relaxation and stimulate the olfactory system, thereby helping to reduce nausea sensation. Therefore, peppermint aromatherapy can be used as a simple, safe, affordable, and beneficial non-pharmacological nursing intervention to reduce nausea in CKD patients after hemodialysis.
Keywords: peppermint aromatherapy, chronic kidney disease, hemodialysis, nausea, nausea severity scale.

INTRODUCTION

Chronic Kidney Disease (CKD) is a chronic kidney function disorder that progresses gradually and irreversibly, characterized by a decreased ability of the kidneys to maintain fluid, electrolyte, acid-base balance, and eliminate metabolic waste products. This disease has become one of the global health problems because its prevalence continues to increase and it affects the need for long-term health care services. In Indonesia, CKD remains an important concern because some patients are only diagnosed when they have reached an advanced stage and require kidney replacement therapy, one of which is hemodialysis (Hustrini, Susalit, & Rotmans, 2023). This condition indicates that CKD affects not only the physiological aspects of patients but also creates significant social, economic, and psychological burdens for patients and their families.

Hemodialysis is a kidney replacement therapy commonly provided to patients with end-stage CKD to help remove uremic toxins, control excess fluid, and maintain electrolyte balance. However, hemodialysis therapy is not entirely free from complaints. Patients undergoing hemodialysis may experience various symptoms, such as fatigue, intradialytic hypotension, muscle cramps, dizziness, vomiting, and nausea. Nausea is one of the complaints that can reduce patient comfort, interfere with nutritional intake, cause anxiety, and affect quality of life during hemodialysis therapy (Arghide et al., 2023).

Nausea in CKD patients after hemodialysis may occur due to rapid changes in fluid balance, changes in blood pressure during the procedure, electrolyte imbalance, accumulation of uremic toxins, and the

body's physiological response to the dialysis process. This complaint requires attention in nursing practice because it can cause discomfort, reduce appetite, and potentially affect patient adherence to hemodialysis therapy. Therefore, nursing interventions are needed that are not only pharmacological but also non-pharmacological, easy to apply, safe, and able to improve patient comfort.

One non-pharmacological intervention that can be used to help reduce nausea is peppermint aromatherapy. Peppermint contains menthol as its main active compound, which plays a role in providing a relaxing effect on gastrointestinal smooth muscles and a comfortable sensation through stimulation of the olfactory system. Inhaled peppermint aroma can stimulate the limbic system in the brain, which is associated with emotion, comfort, and response to nausea. This mechanism supports the use of peppermint as a complementary therapy to reduce nausea in various clinical conditions (Gergő et al., 2025).

Several previous studies have shown that peppermint aromatherapy has potential in reducing nausea and vomiting. Safajou, Soltani, Taghizadeh, Amouzeshi, and Sandrous (2020) found that the combination of lemon and peppermint aromatherapy could reduce the intensity of mild to moderate nausea and vomiting. In addition, a recent systematic review also showed that peppermint oil inhalation has potential as a supportive intervention to reduce the severity of nausea and vomiting in several patient groups, although its effectiveness still needs to be evaluated according to each patient's clinical condition (Gergő et al., 2025; Safajou et al., 2020).

In the context of CKD patients undergoing hemodialysis, research on peppermint aromatherapy still needs to be strengthened, particularly regarding its direct application in nursing practice in inpatient wards. Several nursing studies have shown that peppermint-based interventions can provide positive effects on the comfort of patients undergoing hemodialysis, including helping to reduce complaints that occur after the procedure. Therefore, a case study on the administration of peppermint aromatherapy to CKD patients after hemodialysis is important as an effort to strengthen evidence for simple, affordable, and easily applicable non-pharmacological nursing practice.

Based on the explanation above, this study aims to analyze the effectiveness of peppermint aromatherapy on nausea intensity in Chronic Kidney Disease (CKD) patients after hemodialysis. This study is expected to contribute to the development of complementary nursing interventions that can be used to improve the comfort of CKD patients after undergoing hemodialysis therapy.

RESEARCH METHOD

This study used a descriptive qualitative design with a case study approach. This design was selected because the study focused on describing nursing care and evaluating changes in nausea intensity in Chronic Kidney Disease (CKD) patients after hemodialysis following the administration of peppermint aromatherapy. A case study approach allows researchers to explore clinical phenomena in depth in a real nursing practice setting, particularly when the number of participants is limited and the intervention is observed directly in individual patients (Hidayat, 2021; Notoatmodjo, 2022).

The study was conducted in the Bromo Ward of a Regional General Hospital in Malang City on April 14, 2026. The subjects in this study were two CKD patients who experienced nausea after undergoing hemodialysis. The patients were selected using purposive sampling based on clinical considerations and the suitability of the cases with the research objective. The inclusion criteria were patients diagnosed with CKD, undergoing routine hemodialysis, experiencing nausea after hemodialysis, being conscious and cooperative, being able to communicate well, and willing to receive peppermint aromatherapy intervention. The exclusion criteria were patients with decreased consciousness, respiratory distress, known allergy or hypersensitivity to peppermint aroma, severe nausea requiring emergency pharmacological treatment, and patients who refused to participate in the intervention.

The instrument used to measure nausea intensity was the **Nausea Severity Scale (NSS)** using an 11-point numerical rating format ranging from 0 to 10. A score of 0 indicates no nausea, while a score of 10 indicates the most severe nausea possible. The use of a 0–10 numerical scale is commonly applied in clinical assessment because it is simple, easy to understand, and allows patients to report symptom intensity subjectively. Russell et al. (2018) explained that nausea intensity can be assessed using a 0–10 rating scale, where 0 represents no nausea and 10 represents the highest possible nausea intensity. Similar

clinical guidelines also recommend assessing nausea intensity using a 0–10 scale to determine symptom severity and guide intervention planning (Suliman, 2023). In this study, the NSS score interpretation was categorized as follows: score 0 = no nausea, score 1–3 = mild nausea, score 4–6 = moderate nausea, and score 7–10 = severe nausea. This categorization refers to clinical symptom severity interpretation commonly used in nausea assessment guidelines, where scores 1–3 indicate mild nausea, 4–6 indicate moderate nausea, and 7–10 indicate severe nausea.

The intervention procedure was carried out after the patients returned to the ward following hemodialysis. Before the intervention, the researcher assessed the patients' general condition, vital signs, and nausea intensity using the NSS. Peppermint aromatherapy was administered by applying three drops of peppermint essential oil onto a tissue folded into four layers. The tissue was then placed near the patient's nose at a comfortable distance, and the patient was instructed to inhale the peppermint aroma slowly and regularly for 10 minutes. The inhalation method was chosen because peppermint aroma can stimulate the olfactory system and limbic area, which are associated with comfort, relaxation, and nausea response. Previous studies have reported that peppermint essential oil inhalation may help reduce nausea intensity, particularly within short observation periods of approximately 5–10 minutes (Gergő, János, Zsolt, & Péter, 2025). The use of 2–3 drops of peppermint essential oil on tissue for approximately 10 minutes has also been applied in previous aromatherapy intervention procedures (Mohi, 2026).

Evaluation was conducted by reassessing nausea intensity using the NSS after the peppermint aromatherapy intervention was completed. The pre-intervention and post-intervention NSS scores were compared descriptively to determine changes in nausea intensity. The results were presented in the form of individual case descriptions and a summary table showing the decrease in NSS scores before and after the intervention. The effectiveness of the intervention was indicated by a decrease in NSS scores and a change in nausea category from severe to moderate or mild. Data analysis was performed descriptively by comparing the changes in nausea intensity in each patient before and after peppermint aromatherapy administration.

RESULTS AND DISCUSSION

This case study involved two Chronic Kidney Disease (CKD) patients who experienced nausea after undergoing hemodialysis. Both patients received peppermint aromatherapy as a non-pharmacological nursing intervention after returning to the ward following hemodialysis. Nausea intensity was assessed using the Nausea Severity Scale (NSS) before and after the intervention.

The first patient, Mrs. Y, was 50 years old and had been diagnosed with CKD for approximately four months. She routinely underwent hemodialysis twice a week. After returning to the ward following hemodialysis, the patient reported nausea and stated, "I feel nauseous, nurse, every time after hemodialysis, and this has happened for the past two weeks." The patient's vital signs showed blood pressure of 135/90 mmHg, pulse rate of 100 beats/minute, respiratory rate of 21 breaths/minute, body temperature of 36.5°C, and oxygen saturation of 96%. Before the intervention, the NSS score was 8, categorized as severe nausea. After receiving peppermint aromatherapy for 10 minutes, the NSS score decreased to 4, categorized as moderate nausea.

The second patient, Mrs. M, was 67 years old and had been diagnosed with CKD for approximately seven months. She also underwent routine hemodialysis twice a week. After hemodialysis, the patient complained of nausea and stated, "I feel nauseous, nurse, every time after hemodialysis." The patient's vital signs showed blood pressure of 134/87 mmHg, pulse rate of 87 beats/minute, respiratory rate of 22 breaths/minute, body temperature of 37.1°C, and oxygen saturation of 98%. Before the intervention, the NSS score was 8, categorized as severe nausea. After receiving peppermint aromatherapy for 10 minutes, the NSS score decreased to 3, categorized as mild nausea.

Implementation Results

Table 1. Changes in Nausea Intensity among CKD Patients after Hemodialysis

Patient	NSS Before	Category	NSS After	Category	Description
Mrs. Y	8	Severe nausea	4	Moderate nausea	Decreased nausea intensity
Mrs. M	8	Severe nausea	3	Mild nausea	Decreased nausea intensity

Based on Table 1, both patients experienced a decrease in nausea intensity after receiving peppermint aromatherapy. Mrs. Y showed a decrease in NSS score from 8 to 4, while Mrs. M showed a decrease from 8 to 3. These findings indicate that peppermint aromatherapy provided a positive effect and showed potential effectiveness in reducing nausea intensity among CKD patients after hemodialysis. However, because this study involved only two patients and did not include a control group, the results should be interpreted cautiously and cannot be generalized to all CKD patients undergoing hemodialysis.

Discussion

The results of this case study showed that peppermint aromatherapy was followed by a decrease in nausea intensity in two CKD patients after hemodialysis. The decrease in NSS scores suggests that peppermint aromatherapy may be beneficial as a supportive non-pharmacological nursing intervention to help reduce post-hemodialysis nausea. However, the term "effective" should be understood in the context of a limited case study, not as conclusive evidence of clinical effectiveness. Therefore, this study more appropriately indicates that peppermint aromatherapy has a potential positive effect in reducing nausea after hemodialysis.

The decrease in nausea intensity may be related to the active compound of peppermint, particularly menthol. Menthol is known to provide a cooling sensation, promote relaxation, and may influence gastrointestinal comfort. When peppermint aroma is inhaled, the olfactory stimulus is transmitted to the brain, especially the limbic system, which is associated with emotional responses, comfort, and perception of unpleasant sensations such as nausea. This mechanism may explain why the patients reported reduced nausea after inhaling peppermint aromatherapy for 10 minutes.

Nevertheless, nausea after hemodialysis is a multifactorial symptom. It may be influenced not only by the aromatherapy intervention but also by several clinical and individual factors. One important factor is the duration of hemodialysis therapy. Mrs. M had undergone hemodialysis for seven months, while Mrs. Y had undergone hemodialysis for four months. The longer experience of Mrs. M in receiving hemodialysis may have contributed to better physiological and psychological adaptation to the procedure, which may partly explain the greater decrease in NSS score observed in Mrs. M.

Blood pressure condition may also influence nausea after hemodialysis. Both patients had relatively stable blood pressure after hemodialysis, with Mrs. Y at 135/90 mmHg and Mrs. M at 134/87 mmHg. Although no severe hypotension was found in these cases, changes in blood pressure during or after hemodialysis can contribute to nausea, dizziness, and discomfort. Therefore, the absence of severe post-hemodialysis hypotension may have supported the reduction of nausea after the intervention.

Another factor that may affect nausea intensity is the use of pharmacological therapy, especially antiemetic medication. In this case study, the possible influence of routine hospital medication or antiemetic therapy could not be fully controlled. If patients received antiemetic medication before, during, or after hemodialysis, the decrease in NSS score might have been influenced by the combined effect of medication and peppermint aromatherapy. This condition is one of the limitations of the study and should be considered when interpreting the results.

Nutritional status and food intake may also contribute to nausea among CKD patients. Patients undergoing hemodialysis often experience appetite changes, dietary restrictions, and gastrointestinal discomfort. Poor nutritional intake before hemodialysis or inappropriate food consumption may increase the risk of nausea after treatment. In this study, nutritional status was not measured in detail; therefore, its influence on nausea intensity could not be analyzed comprehensively.

Patient experience and psychological response to hemodialysis may also affect nausea perception. Patients who are newly undergoing hemodialysis may experience anxiety, fear, or discomfort related to the procedure. These psychological responses can worsen nausea or increase sensitivity to physical symptoms. Mrs. Y, who had undergone hemodialysis for a shorter period, showed a smaller reduction in NSS score compared with Mrs. M. This finding suggests that patient adaptation and experience with hemodialysis may influence the response to nursing interventions.

Overall, the findings of this study support the use of peppermint aromatherapy as a simple, safe, affordable, and easy-to-apply complementary nursing intervention. The intervention does not require complex equipment and can be implemented in clinical nursing practice as long as the patient has no allergy or hypersensitivity to peppermint aroma. However, because this study was limited to two cases, further research involving a larger sample size, a comparison group, and better control of confounding factors such as antiemetic therapy, nutritional status, blood pressure changes, and hemodialysis duration is needed to strengthen the evidence regarding the effectiveness of peppermint aromatherapy in reducing post-hemodialysis nausea among CKD patients.

CONCLUSION

This case study showed that peppermint aromatherapy provided a positive effect in reducing nausea intensity among two Chronic Kidney Disease (CKD) patients after hemodialysis. The NSS score decreased from 8 to 4 in Mrs. Y and from 8 to 3 in Mrs. M after inhaling peppermint aromatherapy for 10 minutes. These findings indicate that peppermint aromatherapy may be considered as a supportive non-pharmacological nursing intervention to help reduce post-hemodialysis nausea and improve patient comfort.

However, the results of this study should be interpreted cautiously because the study involved only two patients and did not use a control group. Therefore, the findings cannot be generalized broadly to all CKD patients undergoing hemodialysis. The decrease in nausea intensity may also have been influenced by other factors, such as patient adaptation to hemodialysis, blood pressure condition, nutritional status, duration of hemodialysis therapy, and possible use of antiemetic medication.

Further studies are recommended using a larger sample size, a more rigorous research design, and better control of confounding variables. Future research should also consider comparing peppermint aromatherapy with standard care or other non-pharmacological interventions to obtain stronger evidence regarding its effectiveness in reducing nausea among CKD patients after hemodialysis.

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