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The effectiveness of *Melissa officinalis* L. essential oil inhalation on anxiety and symptom burden of hemodialysis patients: a randomized trial study

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Abstract

Background Hemodialysis patients suffer from physical and mental symptoms for which aromatherapy might be useful. This study aimed to determine the effectiveness of *Melissa officinalis* L. (Lemon Balm) essential oil inhalation on anxiety and the burden of symptoms in hemodialysis patients.

Methods This study is a randomized clinical trial with a pretest-posttest design. Sixty-eight hemodialysis patients were randomly divided into intervention (who underwent *Melissa officinalis* L. inhalation aromatherapy 3 times a week for one month) and control (who inhaled refined sweet almond oil) groups. The intervention in both groups was conducted during the hemodialysis session. The data were collected using the state-trait anxiety inventory and Dialysis Symptom Index. Data were analyzed through SPSS-25, using Mann-Whitney, Wilcoxon, t-tests and MANOVA.

Results Before the intervention, both groups were similar in terms of anxiety and symptoms burden ($P > 0.05$). However, after the intervention, a significant difference was found between the groups in terms of state and trait anxiety, and severity of constipation, nausea, vomit, diarrhea, swelling in legs, muscle cramps and shortness, worry, nervousness and anxiety, and trouble staying asleep. Moreover, after the intervention, a significant difference was observed between the groups regarding the prevalence of symptoms burden such as feeling anxious and having a dry mouth ($P < 0.05$).

Conclusion *Melissa officinalis* L. essential oil inhalation aromatherapy reduced the symptoms burden and anxiety in hemodialysis patients. Given the effectiveness of aromatherapy in hemodialysis patients, it is suggested that healthcare workers should use this complementary and integrative health to reduce the anxiety and symptoms burden in hemodialysis patients.

Trial registration RCT registry Iranian Registry of Clinical Trials (IRCT) number: IRCT20191021045178N3; Registration date 27/04/2021.

Keywords Aromatherapy, *Melissa officinalis* L., Anxiety, Symptom burden, Hemodialysis

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professor of Traditional Pharmacy who is a member of the Medicinal Plants Processing Research Center was a member of this research team. The product was prepared by an aromatherapy specialist who was familiar with *Melissa officinalis* L. and the extraction method in a reliable pharmaceutical company. To ensure the product safety the research assistant was present with the patients throughout the intervention and was ready to answer their phone calls about possible side effects. Given the challenges and findings of this study, using *Melissa officinalis* L. (Lemon Balm) might be effective in a hemodialysis setting as an implication of this study.

The research limitations included the short duration of the study (20 min in each time), patients' visits in three separate four-hour cycles per day, fear and anxiety of the patients and the researcher about the COVID-19 pandemic, and quick and correct removal of cotton impregnated with essential oil to prevent the spread of aroma in the place after the intervention. Filling out the forms by the researcher's assistant might cause bias. Therefore, it is suggested that in another study illiterate patients should be excluded from the study to reduce the risk of researcher bias.

The results of the present study showed that sweet almond oil reduced trait anxiety. To compare its effect on trait anxiety, it is suggested that three groups of almond oil, *Melissa officinalis* L. (Lemon Balm), and water inhalation aromatherapy should be compared in another study to determine the effect size of each aromatherapy.

Conclusion

The present study demonstrated that *Melissa officinalis* L. essential oil inhalation aromatherapy decreased the symptoms burden and anxiety in hemodialysis patients. *Melissa officinalis* L. essential oil inhalation aromatherapy reduced the severity of constipation, nausea, vomiting, diarrhea, swelling in legs, muscle shortness, worrying, and trouble staying asleep. Moreover, this intervention reduced the prevalence of feeling anxious and dry mouth. Thus, it is suggested that healthcare workers should use this intervention. As to evidence-based practice, it is recommended that more studies should evaluate the effect of *Melissa officinalis* L. aromatherapy on symptoms in ESRD patients undergoing hemodialysis.

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Author contributions

MR, NP, MA and MMZ wrote the main manuscript text. The management of the data analysis was conducted by MR, NP, and MA. MMZ prepared Fig. 2. All authors reviewed and approved the manuscript.

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Data availability

The datasets of this study is available from the first author on reasonable request.

Declarations

Ethics approval and consent to participate

The present study was approved by the Ethics Committee of Shiraz University of Medical Sciences (Code: IR.SUMS.REC.1400.065). The study was performed following the Declaration of Helsinki. All hemodialysis patients signed an informed consent form. The research participants were aware of the research objectives and method, confidentiality of information, side effects of the essential oil, and the right to withdraw from the study; they were assured that there would be no change in their treatment and care. Written and informed consent was obtained from all participants.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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