Effect of lavender aromatherapy through inhalation on quality of life among postmenopausal women covered by a governmental health center in Isfahan, Iran: A single-blind clinical trial

ARTICLE INFO

ABSTRACT

Background: Various studies indicate the negative effects of menopausal symptoms and complications on the quality of life (QOL) of women. The tendency to use different methods of complementary medicine to control menopausal symptoms is increasing. In addition, lavender essential oil has been shown to have positive effects on some symptoms associated with menopause. Thus, the present study was conducted with the aim to determine the effect of lavender aromatherapy on the QOL of postmenopausal women.
Materials and methods: A randomized, controlled, clinical trial was conducted on 62 postmenopausal women referred to health centers of Isfahan, Iran. The subjects were divided into two groups of control and intervention. The intervention group inhaled 2% lavender essential oil every night before bedtime for 20 minutes during one month. The control group received the placebo (distilled water) in the same manner as the intervention group. The data collection tools were the Menopause-Specific Quality of Life Questionnaire (MENQOL)and a demographic characteristics questionnaire. The results were analyzed using descriptive and inferential statistical tests in SPSS software.
Results: The independent *t*-test showed a significant difference in the mean total score of QOL and its various dimensions (vasomotor, psychosocial, physical, and sexual dimensions) after the intervention between the aromatherapy and placebo groups ($P < 0.001$).
Conclusions: Inhalation aromatherapy using lavender essential oil can improve the QOL of postmenopausal women with a reduction in the severity of complications and physical-psychological symptoms.

1. Introduction

Menopause is part of life that all women will face [1], and as a stage of life, it is accompanied with changes like termination of fertility [2]. Although menopause is considered as a normal stage of women's lives, many women experience various problems before and after this stage. Through its symptoms and complications, menopause affects mental, physical, and emotional health, as well as social performance, and family relationships. These effects can be found in the single concept of quality of life (QOL) [1].

Today, the QOL of postmenopausal women is one of the main concerns of health professionals and is recognized as an indicator for measuring health status in health research [3]. Some studies have reported the lack of effect of menopause on QOL [4,5], however, the results of several studies indicate the effect of menopausal symptoms and complications on the QOL of women [5–7] Today, with the attitude that they can control their own health, women prefer complementary medicine to chemical methods in order to reduce the severity of symptoms and complications of menopause [8]. In the United States and Australia, more than half of women use some type of complementary therapy during their middle-aged years. The results of a clinical trial suggest that complementary therapies improve menopausal symptoms or have benefits similar to conventional medications [9]. Aromatherapy is a supplementary therapy method used throughout the world. In this method, aromatic oils extracted from plants and flowers are used through inhalation, bathing, or massage to treat various diseases. One of the important plants used in aromatherapy is lavender, a herbaceous, aromatic, and evergreen plant which belongs to the Lamiaceae family. It has anti-fatigue, anti-insomnia, analgesic, antibacterial, local anesthetic, wound healing, sedative, antidepressant, and anticonvulsant properties. Moreover, it controls vasomotor and hemodynamic symptoms, and increases sexual desire [10,11].

Epidemiological studies show that 60–68% of women experience menopausal symptoms early in menopause ages, and about 80% of them have symptoms like flushing, night sweats, palpitations, dizziness, fatigue, and irritability. In addition, 9% of these women have severe symptoms which can affect their QOL. Due to the increase in life expectancy, women spend more than a third of their lives in the menopause period [12]. Therefore, paying attention to their welfare and health during this period can be effective on preventing physical, mental, and social challenges. Women account for a large part of society and their health guarantees the health of the family and society. Despite the tendency of middle-aged women to use herbaceous supplements, and the introduction of complementary medicine by the World Health Organization (WHO) as an effective treatment method for the improvement of menopausal symptoms [13] limited studies have been conducted on the effect of lavender aromatherapy on various aspects of QOL of postmenopausal women. Thus, the researchers decided to perform this study with the aim to determine the effect of lavender aromatherapy on the QOL of postmenopausal women. The present study was an attempt to maintain the health and promote the QOL of these women. Then based on previous studies and positive effects of lavender on pain, stress, depression, blood circulation the main study hypothesis was the mean of total quality of life score in the test and control groups immediately after the intervention is different.

2. Materials and methods

The present study was a single-blind clinical trial (possessing the registration number IRCT2017081535706N1) was executed among 62 postmenopausal women in two groups of intervention and control at Navab Safavi Health Center in Isfahan Province, Iran, in 2017. Based on a study by Bikmoradi et al. [14]. on the effect of inhalation aromatherapy on stress and vital signs of patients who have undergone cardiac surgery, the sample number was determined (n = 70 individuals) using the statistical formula with a test power of 90% and a significance level of 5%. The large number of the middle-aged women covered in this center in comparison to other centers was the reason for the selection of this center. Sampling was performed through systematic random sampling method using the family planning offices in the center. First, the 102 postmenopausal women who referred to the center from February to July and their profile was recorded in the office were listed. Then, based on the sample size (n = 70), the distance between the selection of subjects was calculated and after drawing a number from 1 to 102, the first subject was determined according to the list, then, by adding the obtained distance to this number, the next subjects were determined. After the evaluation of the study inclusion criteria by the researcher, sampling continued until the desired sample number was reached.

All of the drugs used in the study were coded by a pharmacist (35 codes for the 2% lavender essential oil produced by Barij Essence Pharmaceutical Company and 35 codes for the distilled water). Each code was written on a piece of paper and placed inside an envelope, then, the envelope was closed. There was a container of drugs for each code which was registered on the container. All containers were the same size, dark-colored, and designed in such a way to prevent leakage of essential oils. The envelopes were distributed continuously among the subjects during the first visit. Then, the envelopes were opened by the researcher, and based on the code inside them, the corresponding drug was delivered to each subject. In the follow-up phase, 4 subjects of the control group (for discontinuation of cooperation) and 4 individuals from the test group (2 because of intolerance to lavender inhalation and 2 due to forgetting the intervention for more than 3 nights) were excluded. Finally, 31 patients from each group participated in the research (Fig. 1). The researcher (evaluator and interviewer) was not aware of the type of drug received by any of the subjects. Only the pharmacist was aware of the nature of the codes (A = lavender), (B = placebo). The nature of the codes was hidden until the data on the last participant in the research were analyzed. All participants voluntarily and deliberately participated in the study after completing the consent form. The study inclusion criteria for women included:(a) willingness to participate in the study,(b) the age of over 45 years,(c) lack of a menstrual period during at least the last 12 months,(d) passage of a maximum of 5 years and at least 1 year of menopause age,(e) confirmation of general health by a physician,(f) lack of chronic diseases like diabetes, and heart, kidney, respiratory, and skin diseases,(g) lack of sensitivity to herbal medicines,(h) lack of use of treatments like hormone therapy in the last 6 months,(i) lack of emotional problems with spouse, and (j) lack of severe stress, anxiety, insomnia, or depression which need to receive their medications in the past 6 months. In addition, women who experienced sensitivity or drug complications during the use of the drug, were reluctant to continue the study, experienced the occurrence of an extreme stress or sudden mental disorder, forgot to take medicine (aromatherapy and placebo) for more than 3 nights during the one month of intervention which was asked by researchers, and experienced impairment in the sense of smell were excluded from the study. Details of the study were described for the participants.

The data collection tools used were the Menopause-Specific Quality of Life Questionnaire (MENQOL) and a demographic questionnaire including menopause age, postmenopausal period, number of children, marital status, occupation status, education level, weight, height, and body mass index. The MENQOL is a valid tool for assessing QOL, has been designed and standardized by Hilditch et al. [15] at the University of Toronto, Canada, and has been used in most valid papers. The reliability coefficient of this questionnaire was obtained as 85% using Cronbach's alpha in the study by Fallahzade et al. [3]The tool consists of 29 questions regarding symptoms and complications of menopause in the 4 dimensions of vasomotor, psychosocial, and physical symptoms, and disorder in sexual relationships with 3, 7, 16, and 3 questions, respectively. All items follow the same format in which the woman is asked whether she had experienced the items. If 'no', the subject would go to the next item while a 'yes' leads her to a 7-point Likert scale ranging from 0 (not at all bothered) to 6 (extremely bothered). The questions were scored based on a 6-point Likert scale; the options "I do not have" and "very severe" were given a score of 1 and 6, respectively. The total score of the questionnaire indicates the overall score of QOL. The lowest and highest possible total scores of the MENQOL are 29 and 232, respectively. The QOL score in each area was obtained based on the total score of the questions in each of the dimensions of QOL. The higher and lower scores in each dimension, respectively, indicated a worse or better QOL. An overall QOL score of 29–97, 97–165, and 165–232 was classified as a good, moderate, and poor QOL, respectively.

Women in the aromatherapy group inhaled two drops of 2% alcohol-based lavender essential oil (2% lavender essential oil mixed in distilled water, produced by Barij Esans company in Kashan, Esfahan, Iran). First, subjects underwent primary evaluation to determine individual characteristics like weight, height, BMI, menopause age, duration of menopause, number of children, occupation, marital status, and education level. After the assessment of the participants in terms of the study inclusion criteria and completion of the demographic characteristics questionnaire and MENQOL by the assessor simultaneously to the delivery of the relevant drug (lavender essential oil or placebo), the subjects were trained to pour 2 drops of the received drug on a 10 × 15 cm piece of cloth using a dropper and fix it to their collar with a pin and remove it after 20 minutes and perform this every night before bedtime for 4 weeks [14]. It is necessary to mention Essence was inside the container that was not leaked after closing the door and we told the participants close the lid of the container immediately after usage.

For follow-up, the subjects were called to attend the Navab Safavi Health Center, then, the MENQOL was completed by the assessor at the end of the fourth week of intervention (end of intervention) by interviewing the participants and based on their responses. During the intervention, the investigator contacted and sent messages twice a week in order to ensure the regular use of the essence by participants. The data were collected, and then, statistically analyzed at the significance level of 0.050 using descriptive (mean and standard deviation) and inferential l (independent samples *t*-test, and Mann-Whitney, Wilcoxon signed-rank, and chi-square tests) statistical indicators in SPSS software (version 16, SPSS Inc., Chicago, IL, USA).

3. Ethical considerations

This article obtain from a research project approved, by the Women's Health Research Center of Isfahan Faculty of Nursing and Midwifery, Isfahan, Iran (with the code of 2950055). The aims of the study were explained to the participants, and they gave a written informed consent to participate in the study.

4. Results

In this study, the age range of the subjects was 45–65 years, and the mean age of the test and control groups was 55.2 ± 5.3 and 53.8 ± 3.1 years, respectively. Independent *t*-test showed that the difference between mean age of the two groups was not significant (P = 0.210). The demographic characteristics of the subjects under
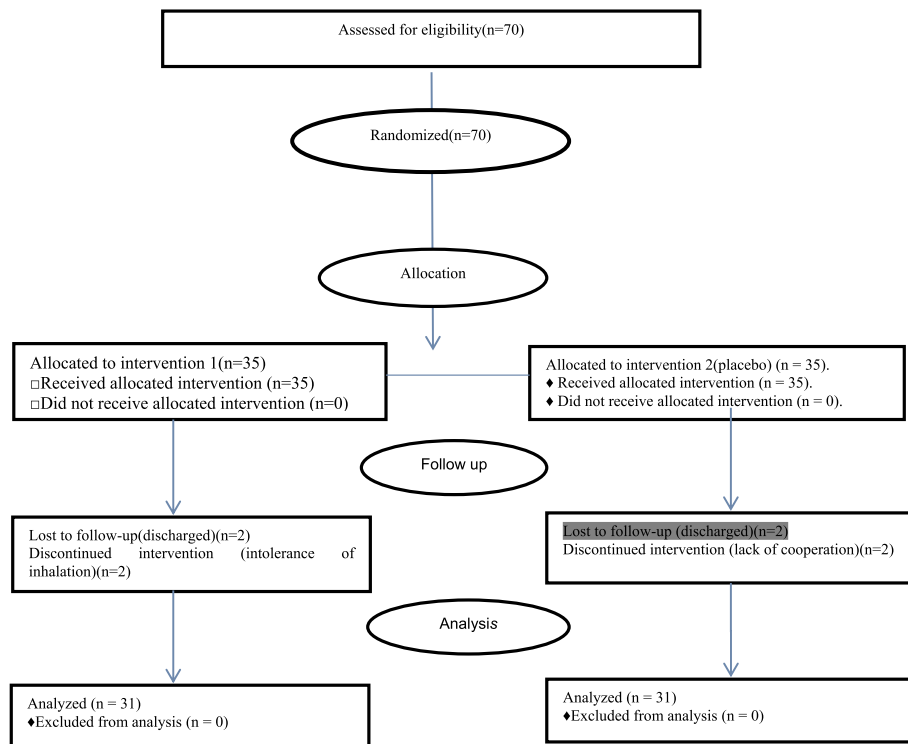
Fig. 1. Trial profile.

Table 1
Comparison of demographic characteristics between test and control groups.

Variable	Test group	Control group	Test
	Mean (SD)*	Mean (SD)*	
Age of menopause (years)	51.8 (4.6)	50.5 (2.8)	t = 1.33 P = 0.19
Duration of menopause (years)	3.4 (1.7)	3.3 (1.3)	t = 0.25 P = 0.80
Number of children	2.5 (2.0)	2.9 (1.4)	t = 0.88 P = 0.38
Height (cm)	161.0 (7.2)	159.5 (1.6)	t = 0.87 P = 0.39
Weight (kg)	70.7 (10.0)	70.2 (9.6)	t = 0.20 P = 0.84
Body mass index (BMI)	27.3 (3.9)	27.5 (3.1)	t = 0.21 P = 0.83
Marital status	**Rate (%)**	**Rate (%)**	
Single	1.0 (3.2)	0	χ^2 = 4.31 P = 0.12
Married	28.0 (90.3)	31.0 (100.0)	
Widowed	2.0 (6.5)	0	
Occupation			
Housewife	25.0 (80.6)	29.0 (93.5)	P = 0.13
Employee	6.0 (19.4)	2.0 (6.5)	
Education level			
Illiterate	3.0 (9.7)	1.0 (3.2)	Z = 0.27 P = 0.78
Elementary	11.0 (35.5)	13.0 (41.9)	
Secondary school diploma	4.0 (12.9)	7.0 (22.6)	
Diploma	9.0 (29.0)	8.0 (25.8)	
Academic	4.0 (12.9)	2.0 (6.5)	

SD: Standard deviation.

Table 2
Comparison of the mean score of the QOL dimensions and the overall QOL score before and after the intervention between the two groups.

**QOL dimensions	Test group Mean (SD*)	Control group Mean (SD)	Independent *t*-test P
Vasomotor			
Before the intervention	12.2 (5.2)	13.1 (5.0)	t = 0.74 P = 0.460
After the intervention	8.8 (4.1)	12.6 (4.8)	t = 0.34 P = 0.001
Psychosocial			
Before the intervention	24.3 (9.0)	22.1 (8.0)	t = 0.98 P = 0.330
After the intervention	16.1 (6.4)	21.5 (7.5)	t = 3.05 P = 0.003
Physical			
Before the intervention	51.9 (17.1)	49.5 (13.7)	t = 0.61 P = 0.540
After the intervention	36.3 (12.4)	50.0 (11.7)	t = 4.48 P < 0.001
Sexual			
Before the intervention	10.4 (5.8)	10.7 (3.8)	t = 0.26 P = 0.790
After the intervention	8.5 (4.9)	10.6 (3.6)	t = 2.04 P = 0.030
Overall QOL			
Before the intervention	97.7 (31.2)	95.5 (26.9)	t = 0.44 P = 0.660
After the intervention	69.7 (22.1)	92.6 (23.6)	t = 3.95 P < 0.001

*SD: Standard deviation.
**QOL: Quality of life.

study (Table 1) did not show a significant difference between the two groups.

Independent *t*-test showed that there was no significant difference in the mean score of any dimensions of the QOL and the overall QOL score before the intervention between the two groups ($P > 0.050$). However, the mean score of all areas of the QOL and the overall QOL score after the intervention in the test group was significantly lower than the control group ($P < 0.050$) (Table 2).

The Mann-Whitney test showed that there was no significant difference between the two groups in terms of QOL before the intervention ($P > 0.050$); however, after the intervention, it was significantly more in the test group compared to the control group ($P < 0.050$). In

Table 3
Frequency distribution of QOL status before and after the intervention in the two groups.

Period	Status	Test group		Control group		Mann-Whitney test	
		Rate	%	Rate	%	Z	P
Before the intervention	Good	17	54.8	17	54.8	0.23	0.820
	Moderate	12	38.7	14	42.2		
	Poor	2	6.5	0	0		
After the intervention	Good	27	87.1	18	58.1	2.54	0.011
	Moderate	4	12.9	13	41.9		
	Poor	0	0	0	0		
Wilcoxon test	Z	2.97		1		–	
	P	0.003		0.320			

addition, the Wilcoxon test showed that QOL significantly improved in the test group after the intervention ($P < 0.050$) compared to before the intervention ($P < 0.050$). However, in the control group, there was no significant difference between the two periods ($P > 0.050$) (Table 3).

5. Discussion

Menopause symptoms have a close relationship with the QOL of women during menopause, and can influence their QOL either physiologically or psychosocially [16]. Furthermore, the overall QOL score in the test group, which inhaled lavender essential oil every night for one month, significantly decreased compared to the control group at the end of the fourth week (end of intervention) relative to before the intervention. The QOL of postmenopausal women included the vasomotor, social, physical, and sexual dimensions. Vasomotor symptoms included flushing and night sweats, somatic symptoms comprised fatigue, physical pain, vaginal dryness, and psychological symptoms included irritability, stress, anxiety, depression, reduced sexual desire, and sleep-related problems [17]. Williams & et al. showed that vasomotor symptoms, including active flushing, physical and social activities, leisure time, sleep, mood, and concentration affect sexual activity and energy levels among women and generally cause a decrease in their QOL [18]. Thus, the probability of the occurrence of this issue is higher among women with severe flushes compared to women with mild to moderate flushes [18]. The results of the present study showed that inhalation of lavender essential oil causes a significant difference in the vasomotor dimension of QOL for both intervention and control groups at the end of the fourth week, which is in agreement with the results of the study by Kazemzadeh et al. [19].

Sexual issues are the cause of health concern among most postmenopausal women. Sexual relationship is one of the most important factors affecting the happiness of marital life, which, if not satisfying, causes feelings of defeat, failure, mood changes, and lack of feeling of security, and hence, influences QOL [20,21]. Kalarhoudi et al. showed in their study that sexual desire decreases and sexual dysfunction increases during menopause [22]. According to the results of the present study, the use of lavender essential oil resulted in a significant difference in the sexual dimension of QOL between the intervention and control groups. The study by Malakouti et al., on the effect of inhalation of lavender essential oil combined with other essential oils on sexual desire among postmenopausal women, showed that using this combination of essential oil three times a day for 6 weeks improved the sexual performance of postmenopausal women [23]. The similarity of the results of the study by Malakouti et al. [23] and the present study suggests that inhalation aromatherapy can improve the sexual performance of postmenopausal women.

Musculoskeletal pain, osteoporosis, headache, cardiovascular problems, and urinary incontinence are some of the physical complications of menopause which affect the QOL of women [24]. In addition to age, decrease in the level of androgen hormones like estrogen causes these problems [25]. Although the results of some studies [15,26] do not

confirm the phytoestrogenic qualities of lavender, the results of the present study show a significant difference in the physical dimension of QOL in both intervention and control groups (Table 2). The results of some studies indicate the effect of lavender essential oil on the reduction of the severity of different types of pain, including headache and musculoskeletal pain, insomnia, and fatigue [27–30]. This can be due to the relaxative, analgesic, and sedative effects of linalool and linalool acetate compounds contained in lavender essential oil [31].

Reduction in female hormones, sexual, physical, and appearance changes like increased facial hair, skin wrinkles and variation, and changes in the roles, expectations, and supports of associates, and consequently, changes in the attitudes of women towards themselves during menopause are the cause of numerous psychosocial problems ranging from fatigue and insomnia to changes in mood, anxiety, and depression, all of which can affect QOL [14,32,33]. The results of the present study show a significant difference in the score of the psychosocial dimension of QOL in the intervention and control groups. According to previous studies, it can be stated that lavender essential oil can improve the psychosocial dimension of QOL through affecting the rate of stress, anxiety, depression, and sense of well-being of women [34].

6. Conclusions

Various studies have reported the existence of a relationship between the QOL of postmenopausal women and various factors, including demographic characteristics, personality traits, type of occupation, educational level, economic status, and coping behavior. Based on the results of the present study, it seems that inhalation aromatherapy using lavender essential oil has been able to improve the QOL of postmenopausal women by reducing the severity of the complications and physical and psychological symptoms. Therefore, this method can be considered by menopausal women. One of the research limitations was that some people, despite being eligible for inclusion in the study, refrained from participation in the study due to the long duration of the intervention. Since the change in QOL is a long-term process, and menopausal complications are not temporary and may continue for many years, it is suggested that a study be carried out on the effect of the periodic use of lavender essential oil on the different dimensions of QOL at different times.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ctcp.2018.11.001.

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Soheila Bakhtiari (Phd Candidate)
Faculty of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran
Nursing and Midwifery Care Research Center, Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran
E-mail address: bakhtiari@nm.mui.ac.ir.

Somayeh Paki
Nursing and Midwifery Care Research Center, Isfahan University of Medical Sciences, Isfahan, Iran
E-mail address: s_paki68@yahoo.com.

Arash khalili
Mother and Child Care Research Center, Hamadan University of Medical Sciences, Hamadan, Iran
E-mail address: arash5920@yahoo.com.

Fereshteh Baradaranfard, Sorour Mosleh, Mozhgan Jokar[*]
Nursing and Midwifery Care Research Center, Isfahan University of Medical Sciences, Isfahan, Iran
E-mail addresses: Baradaranfard.f@gmail.com (F. Baradaranfard),
Mosleh22@yahoo.com (S. Mosleh),
nurse_jokar@yahoo.com (M. Jokar).

[*] Corresponding author. MSc In Medical Surgical Nursing, Nursing and Midwifery Care Research Center, Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran. Tel.: +98 31 37927502, 09365512732.