

Effect of lavender aromatherapy on well-being among hemodialysis patients: A randomized clinical trial

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ABSTRACT

In spite of the improvement of dialysis techniques, hemodialysis patients still experience debilitation. Impaired functioning, well-being, and quality of life are among the factors that are of a great concern in these patients. The current study aimed to examine the effects of lavender essential oil on well-being among hemodialysis patients. This randomized clinical trial was conducted on 30 hemodialysis patients. For each patient in the experimental group, five cotton balls were prepared using two drops of lavender essence diluted with sweet almond oil. Lavender was used at five concentrations of 10%, 20%, 30%, 40%, and 50%, administered through pinning the soaked cotton ball on the patients' collar on the first, second, third, fourth, and fifth weeks of the intervention, respectively. The patients were asked to breathe normally for 20 min. On the other hand, the control group received only routine nursing care. The perceived sense of well-being was measured in both groups at the end of each week using a visual analog scale. The mean ages of patients were obtained as 58.9 ± 14.31 and 53.03 ± 15.84 years for the experimental and control groups, respectively. Hypertension was reported to be the most common underlying disease in both groups. The results showed a significant difference in the mean level of well-being in the experimental group in the fourth and fifth weeks of the intervention, compared to that before the intervention. Inhalation aromatherapy with 40% and 50% lavender essence had a positive effect on the perceived sense of well-being in hemodialysis patients. However, lower concentrations of 10%, 20%, and 30% did not exert a comparable effect.

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Introduction

In spite of the improvement of dialysis techniques, hemodialysis patients still experience debilitation (1). Impaired functioning, well-being, and the quality of life are among the factors that are of a great concern in these patients. Based on the evidence, there is an inverse correlation between the physical and mental function and the risk of hospitalization and mortality in patients with end-stage renal disease (2). Well-being is defined as a good or satisfactory condition of existence and a state characterized by health, happiness, and prosperity (3). Although dialysis patients cope with their lifestyle restrictions, they experience less satisfaction, compared to patients without renal failure (4). Moreover, hemodialysis patients have to adhere to the prescribed regimen as long as they need dialysis, which is necessary for optimal health and well-being (5).

The sense of well-being in dialysis patients is more compromised than in patients with other chronic diseases. Any impairment in the sense of well-being can decrease quality of life among these patients. According to a study, the ability of self-management in hemodialysis patients can be directly correlated with their sense of well-being (6). However, few studies have evaluated ways to enhance the sense of well-being in hemodialysis patients.

In a study, Matthews et al. examined the effects of intercessory prayer, positive visualization, and expectancy on well-being among hemodialysis patients. The results of the aforementioned study showed that the patients who practiced intercessory prayer had a better sense of well-being than the other two groups (7). Lin *et al.* reported that music therapy can improve the overall well-being among elderly patients with maintenance hemodialysis (8).

Furthermore, Lolaty et al. studied the effects of family-friend visits on well-being in patients with myocardial infarction admitted to a coronary care unit. They found that family-friend visits had a significant influence on the improvement of well-being in patients with myocardial infarction (9). The relaxation technique proposed by Benson is another helpful tool for the enhancement of well-being (10). Aromatherapy is also envisaged to improve the sense of well-being.

Aromatherapy is defined as "an intervention using essential oils extracted from plants inhaled through the nose to produce relaxation, pain reduction, and alleviation of conditions such as bronchitis" (p. 21, 11). In addition to alleviating anxiety, depression, and fatigue, aromatherapy has sedative effects and promotes

physical and psychological well-being (12-16).

However, to the best of our knowledge, a few studies have examined the effect of lavender essence on patients' sense of well-being. Fellowes et al. found out that aromatherapy and massage have short-term benefits on psychological well-being among patients with cancer (17). Lavender is one of the most commonly used essential oils in aromatherapy, which improves sleep quality (18) and alleviates the symptoms of anxiety and depression (19).

Lavender essential oil can also improve the sense of well-being in patients with cancer (20). Previous studies have addressed the effect of aromatherapy on fatigue, anxiety, and depression among hemodialysis patients (15, 16). Regarding this, the current study was conducted to examine the effects of lavender essential oil on well-being among these patients.

Materials and Methods

This randomized clinical trial was conducted in Behshahr Hospital of Mazandaran University of Medical Sciences, Behshahr, Iran. The study was also registered in the Iranian Registry of Clinical Trials (www.irct.ir) with the registration number of IRCT201505257494N12. The study population included all hemodialysis patients who met the following eligibility criteria: 1) a minimum of 6 months interval from the last hemodialysis (21), 2) receipt of dialysis three times a week, 3) age of 18 years and over, 4) ability to verbally communicate, 5) uncompromised sense of smell (22), 6) lack of stressful life events during the 6 months preceding the study, 7) non-consumption of sedatives, and 8) no history of hospital stay for mental disorders (21).

Moreover, candidates with kidney transplant, pregnant women or women expecting to get pregnant, patients with acute respiratory infection (22), and drug addicts were excluded from the study. The samples size was calculated as 18 cases at 95% confidence interval based on a pilot study rendering the mean values of 6.20 ± 1.22 and 8.0 ± 1.05 before and after the intervention, respectively. However, with regard to the probability of sample loss, 30 patients were enrolled in the study.

Furthermore, written informed consent was obtained from all patients, and they were all assured of anonymity and confidentiality of the research data. The eligible participants were then given a brief explanation of the study. The sociodemographic and clinical data were collected using an ad hoc questionnaire. The perceived sense of well-being was measured on a 10-cm horizontal line visual analog scale. The scale is graded from 0 to 10, implying the lowest and highest levels of perceived well-being, respectively (10). The experimental group inhaled lavender essence (produced by the Barij Essence Pharmaceutical Company, Kashan, Iran) on dialysis days (i.e., three sessions a week) for a period of 5 weeks. To this end, for each patient in the experimental group, five

cotton balls were prepared using two drops of lavender essence diluted with sweet almond oil. Lavender was used at five concentrations of 10%, 20%, 30%, 40%, and 50%, administered on the first, second, third, fourth, and fifth weeks of intervention, respectively, through being pinned on the patients' collar. The patients were asked to breathe normally for 20 min in a semi-sitting position during the first hour of dialysis. On the contrary, the control group only received the routine nursing care. The perceived sense of well-being was measured in both groups at the end of each week during the last 60 min of the dialysis.

Statistical analysis

The data were analyzed in SPSS software (version 20.0) (Chicago, IL, USA) using independent sample t-test, repeated measures ANOVA, Bonferroni correction, and Chi-square test.

Results

The mean ages of the experimental and control groups were 58.90 ± 14.31 and 53.03 ± 15.84 years, respectively. Hypertension was reported to be the most common underlying disease in both groups. The sociodemographic and clinical data of the participants are shown in Table 1. The mean levels of well-being before the intervention were 6.53 ± 1.47 and 6.76 ± 1.92 in the experimental and control groups, respectively. The results of independent sample t-test showed no

Table 1 Demographic and medical data of hemodialysis patients

Group	Experimental group (n=30)	Control group (n=30)	P-value
Variable			
Age	53.03±15.84	58.9±14.33	0.2
Gender			
Male	(56.7%)	(46.7%)	0.60
Female	(43.3%)	(53.3%)	
Underlying disease			
Hypertension	46.7%	26.7%	0.19
Diabetes	10%	10%	
Diabetes and	30.3%	26.7%	
*Other	13.3%	36.7%	
Marital status			
Married	93.3%	76.7%	0.07
Single	6.7%	23.3%	

* Lupus erythematosus, brain stroke, and poisoning

significant differences between the two groups in terms of the mean levels of well-being ($P = 0.21$). Furthermore, the results of repeated measures ANOVA revealed a significant difference in well-being levels one, two, three, four, and five weeks after the intervention, compared to that before the intervention in both groups ($F=6.62$, $P = 0.001$) (Table 2). A Bonferroni correction also confirmed a significant difference in the mean levels of well-being in the experimental group four ($P = 0.01$) and five weeks ($P = 0.001$) after the intervention, compared to that before the intervention.

Table 2 Comparison of the mean score of well-being before and after the intervention in the experimental and control groups

Group	Experimental group (n=30) (Mean±SE)*	Control group (n=30) (Mean±SE)
Before the intervention	6.53±1.47	6.76±1.92
One week after intervention (10%)	6.73±1.14	6.26±1.7
Two weeks after intervention (20%)	6.56±1.35	6.93±1.85
Three weeks after intervention (30%)	7.33±1.06	7.06±1.91
Four weeks after intervention (40%)	7.86±1.16	6.73±1.48
Five weeks after intervention (50%)	8.3±1.17	6.43±1.81
Repeated measurement Test	F= 12.62, P= 0.001	F= 2.26, P= 0.051
	F= 6.62, P= 0.001	

*Mean±standard error

Discussion

In the present study, the experimental group showed a significant difference in the mean levels of well-being four and five weeks after the administration of lavender essence, compared to that before the intervention. Based on the results, it can be concluded that inhalation aromatherapy with 40% and 50% lavender essence had a positive effect on the perceived sense of well-being in hemodialysis patients. Nonetheless, lower concentrations of 10%, 20%, and 30% did not have a comparable effect.

Louis and Kowalski explored the sense of well-being in cancer patients receiving hospice care who were subjected to humidified 3% lavender aromatherapy for 60 min. They assigned the patients into three groups, including negative control (no treatment), positive control (water humidification), and 3% lavender aromatherapy. All patients were examined on three different days both before and after the aromatherapy session. A positive change was detected in the sense of well-being after the lavender treatment. However, the change was really slight. Nevertheless, the improved scores were not statistically different from those of the pre-treatment stage (20).

Barclay et al. investigated the effect of massage with an aromatherapy cream on the mitigation of lymphedema symptoms in cancer patients (23). The aromatherapy plus massage group were massaged with an aromatherapy cream containing wheat germ oil with fennel, sage, geranium, black pepper, and juniper essential oils. On the other hand, the massage group received massage with a simple base cream containing wheat germ oil. All patients performed daily limb massage and simple lymphatic drainage after being instructed by a lymphedema nurse specialist. They were also advised to exercise and take care of their skin. Both groups showed improvements in the sense of well-being; however, these improvements were not statistically significant (23). Aromatherapy can influence moods (24), and massage with an essential oil can provide relaxation and relieve the muscle pain, spasms, and stiffness (25). These can partly explain the improvement of well-being in both groups. Taavoni et al. examined the effect of aromatherapy massage on the psychological symptoms of postmenopausal women. The patients were divided into three groups, namely aromatherapy massage, massage therapy, and control.

The aromatherapy massage group received a 30-min aromatherapy massage twice a week with oil consisting of a mixture of lavender, geranium, rose and rosemary. The massage therapy group received a 30 min massage twice a week with odorless liquid soft paraffin. Furthermore, the control group was given no treatment other than their usual daily routines. Their results indicated that both aromatherapy massage and massage therapy significantly relieved the psychological symptoms of menopause. Meanwhile, this improvement was higher in the aromatherapy massage group than in the massage therapy group. The results of the mentioned study showed that the effectiveness of massage therapy on the psychological symptoms of menopause was boosted by aromatherapy (26), which is in line with our results regarding the benefits of aromatherapy.

In another study, the effects of music therapy on well-being was investigated among elderly patients on maintenance hemodialysis. The experimental group created their music playlists during the first week of the study. They then listened to music from their playlists

during each hemodialysis session (three hemodialysis sessions in total) in the second week. The patients were subsequently evaluated for the effects of music therapy on perceived stressors and adverse reactions during haemodialysis. The results of the mentioned study demonstrated that music therapy can significantly reduce the intensity and frequency of adverse reactions and scores on hemodialysis stressor scale. Additionally, they reported a statistically significant decrease in respiratory rate and an increase in finger temperature and oxygen saturation. Therefore, they concluded that music therapy during hemodialysis can be effective in improving patients' sense of well-being (8). A study involved the investigation of the effect of a social activity on the improvement of psychological well-being and quality of life in hemodialysis patients. The results indicated a significant difference between the experimental and control groups in terms of depression, self-esteem, and physical and psychological sub-dimensions of quality of life after the social activity (27). In another study, the effect of family-friend visits was examined on anxiety, psychological indices, and well-being in patients with myocardial infarction admitted to a coronary care unit. The patients were visited by their family members and friends for 15 min in two consecutive days. The sense of well-being was measured using a visual analog scale. The results indicated that patients had an increased sense of well-being after the intervention (9). In addition, Bagheri-Nesami *et al.* evaluated the effect of a relaxation technique proposed by Benson on well-being among patients with rheumatoid arthritis. The experimental group received Benson's relaxation technique combined with medication, while the control group was only given medication. As a result, a statistically significant difference was observed between the two groups in terms of well-being (10).

One of the potential limitations of this study is the participants' different cultural and sociological backgrounds, income levels, and family issues, which may have partly affected their mental status and subsequently sense of well-being.

Conclusion

The results of the present study showed that low concentrations of lavender essential oil had no effect on the improvement of well-being in hemodialysis patients. On the other hand, the participants who inhaled lavender essential oil at the concentration of 50% experienced the greatest sense of well-being. It is recommended to perform further studies to assess the different concentrations of lavender essential oil in order to validate the ideal concentration for the enhancement of sense of well-being among hemodialysis patients.

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Conflicts of Interest

The authors have no conflicts of interest to declare.

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