

## Research Article

## The Effect of Aromatherapy Massage on the Pain Severity and Quality of Life in Acute Migraine Attacks: A Randomized Controlled Trial

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### Abstract

**AIM:** This study aims to investigate the effects of aromatherapy massage on the pain severity and quality of life in patients diagnosed with migraine, in addition to medical treatment during a migraine attack.

**METHODS:** The study was performed as a randomized controlled trial. This study was carried out in the emergency department of a State Hospital. It was performed in the Emergency Department of Bitlis State Hospital. Data was collected between April 15, and October 15, 2017. The sample of the study was consisted of a total of 70 migraine patients including 35 experimental and 35 control group, subjects who visited the emergency department with migraine pain, along with the medical treatment, patients of experimental group were massaged for 15 minutes with an aromatic oil mixture applied on the temple and root of the neck for three weeks.

**RESULTS:** It was found that the VAS scores of the experimental group before the application ( $9.26 \pm 0.95$ ) were significantly higher than the control group ( $8.54 \pm 1.69$ ) ( $p = .03$ ). Migraine quality of life scale total and subscale scores of experimental group after the application were significantly higher than the control group ( $p < .05$ ).

**CONCLUSION:** In the study, it was concluded that aromatherapy massage had an effect on migraine pain and quality of life of patients with migraine.

**Keywords:** Aromatherapy, massage, nurse, pain of migraine, quality of life

### Introduction

As a form of headache, migraine is one of the oldest known diseases. It is derived from the Greek word "hemicrania" which means pain on one side of the head. It is known that the term migraine was first used by Galen in second century AD (Unger, 2006; Üçler, 2018). It is defined as an acute or chronic pain which usually occurs unilaterally, starts at any time of the day, lasts approximately for 4-72 hours in a throbbing manner and may get worse with physical activity (Özden et al., 2015). Because of the severity of the pain and its effect on the quality of life, it is one of the important issues that needs to be addressed (Yavuz et al., 2013). Migraine has an impact on the individual and the national economy due to the intense consumption of medicines and the increasing health expenditures created by the use of the health institution. It is known that during a migraine attack, many patients become unable to do their jobs and they stop working, while the performance of others drop extremely even if they continue to work. In this respect, migraine affects the daily life and normal activities of individuals sometimes completely and sometimes partially. The

World Health Organization (WHO) reveals the importance of this situation by expressing migraine as a "disability" (loss of functionality) (Üçler, 2018).

The triggering factors that contribute the onset of migraine attacks are very diverse and classified under many different headings. They are usually classified as hormonal factors (menopause, pregnancy, birth, menstruation, birth control pills, estrogen replacement therapy, menarche), nutritional factors (monosodium glutamate, aspartame, skipping meals, delayed meals, chocolate, excessive coffee and smoking, tyramine foods, nitrite in foods, citrus fruits, cigarette and alcohol), mental factors (depression, distress, sadness, anxiety, expectation, enthusiasm, concern and other psychological factors), environmental factors (heat and climate changes, pressure changes, bright light or insufficient enlightenment), sleep-related factors (insomnia, excessive sleep, difficulty in falling asleep), drug-related factors (nitroglycerin, histamine, reserpine, hydralazine, estrogen and estrogen-containing drugs, ranitidine), and other factors (head trauma, heavy movement, exercise, prolonged standing, fatigue, persistent cough) (Yavuz et al., 2013).

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In the literature, it is emphasized that migraine that is strongly affecting individuals and societies is also managed by complementary and supportive applications and medical treatment (Turan et al., 2010). One of these methods is aromatherapy massage (Ergin et al., 2016; Shin et al., 2016). In massage therapies, oil mixtures effective on pain are used. The combination of the two approaches, i.e., the use of massage treatments with aromatherapy, enhances the effect on pain. Aromatherapy is the use of essential oils obtained from flowers, leaves, bark, roots, or seeds of plants to improve health and treat various diseases and symptoms. Aromatherapy is applied not only in the form of essential fatty acids but also in the form of infusions, teas, incenses, smokes, perfumes, colognes, ointments, lotions, compresses, and baths (Sert & Özer, 2022; Syder et al., 2014)

Essential oils constitute the most important mechanism of medicinal uses of plants (Wu et al., 2014; Yayli, 2013). Essential oil is a usually colorless or light yellow, volatile, pungent oily mixture obtained from plants or vegetable sources such as root, stem, leaf, fruit, bark, and flowers, which is liquid at room temperature, sometimes freezes and easily crystallizes plants (Yayli, 2013; Zhang et al., 2020). Jasmine, ylang ylang, sandalwood, orange blossom, lemon balm, bergamot, rose, lavender, and peppermint are commonly used aromatic essential oils (Varli et al., 2020) For the relief of the pain, lavender and peppermint are the most common essential oils in aromatherapy applications. Lavender essential oil has a relaxing and sedative effect.

Lavender and mint essential oils, which do not have allergenic properties and are frequently for in migraine-type headaches, were preferred in the study. Lavender, a pleasant aromatic and medicinal herbs, is widely used in traditional medicine due to its analgesic and anti-inflammatory effects (Djenane et al., 2012; Ghelardini et al., 1999; Tayfun, 2019). Lavender has two components including linalool and linalyl acetate and a stimulating effect on the parasympathetic nervous system (Ghelardini et al., 1999). Lavender oil is used as a diuretic, anti-epileptic, analgesic, antirheumatic, for migraine pain, and for postoperative pain (Ghelardini et al., 1999; Hajhashemi et al., 2003). There are many studies that report lavender essential oil as a treatment for migraine-type headaches (Tayfun, 2019; Tisserand and Young, 2014; Varli et al., 2020). Also, it is stated that lavender essential oil is the oil with least toxic and allergic effects (Ergin et al., 2016). Another essential oil effective on pain is peppermint (Sasanejad et al., 2012; Silva et al., 2015). Menthol in the composition of peppermint essential oil (*Aetheroleum Menthae Piperitae*) is very effective in acute headache (Varli et al., 2020). When applied together with massage, aromatherapy increases the dermal absorption of essential oils (Syder et al., 2014).

There are currently no studies on the effect of peppermint and lavender oil mixtures on migraine pain although their effects on different pain types has been reported. In addition to medical treatment for migraine headaches, making complementary and supportive treatment methods widespread and the use of aromatherapy a lifelong habit will result in less drug consumption, reduced hospital admissions, shorter duration of migraine attacks, and an improvement in the quality of life in patients

with migraine. The findings obtained from this study will contribute to the literature in this respect. The present study aims to investigate the effects of aromatherapy massage on the pain severity and quality of life of patients diagnosed with migraine, in addition to medical therapy during migraine attack.

## Hypotheses

**H0:** Massage with aromatic oils has no effect on the severity of pain in individuals experiencing acute migraine attacks.

**H1:** Massage with aromatic oils has an effect on the severity of pain in individuals experiencing acute migraine attacks.

**H2:** Massage with aromatic oils has no effect on the quality of life in individuals experiencing acute migraine attacks.

**H3:** Massage with aromatic oils has an effect on the quality of life in individuals experiencing acute migraine attacks.

## Methods

### Research Aim and Type

The study was conducted as a randomized controlled trial (Clinical Trial ID: NCT04151576) (Consort, 2010).

### Research Population and Sample

The research was conducted between April 15, 2017 and October 15, 2017. It was performed in the emergency department of a State Hospital. The sample of the study was consisted of a total of 70 migraine patients. The sample of the study was consisted of a total of 70 migraine patients including 35 experimental and 35 control group subjects who visited the emergency department with migraine pain, diagnosed with migraine according to International Headache Society (HIS) and met the study criteria. Agreeing to participate in the study, being able to speak Turkish, being literate, being between the ages of 18 and 50, not having any communication problems, having vital signs within normal limits and not being diagnosed with a psychiatric disorder were accepted as study criteria.

Simple randomization method was used in determining the group of the patients. The order of admission to hospital was taken into consideration in randomization. On the day of the study, the first patient was included in the experimental group and the second patient in the control group. The first group was determined by drawing lot together with the emergency department head nurse. Informed consent was obtained from patients who agreed to participate in the study. Due to the principle of bias and objectivity, the second application of the scale to the experimental group was performed by a different researcher. Besides, according to the principle of benefit and justice, the control group patients were given the same aromatic oil after the study, massaged and their relatives were taught massage. The first massage was performed by a researcher who had received training on aromatherapy and massage. In subsequent applications, practical training was given to the patient or their relative and the essential oils were delivered to them. 13 participants withdrew from the study voluntarily for different reasons.

Working pattern of the workflow is given in Figure 1. After obtaining the necessary permissions, the physicians and nurses working in the clinic where the study will be conducted were informed about the study and the process. Announcements showing the contact information and work plan were prepared and posted by the researcher to appropriate areas for the staff. Data collection process started with patient's visit to the clinic.

The control group patients received medical treatment given by the physician according to the clinical routine and directives. Blood pressure, oxygen saturation and pain were evaluated. After 30 minutes of medical treatment, blood pressure, oxygen saturation, and pain of patients were reevaluated, and "24-Hour Migraine Quality of Life Scale" was performed.

As for the control group, the patients in the experimental group received medical treatment given by the physician according to the clinical routine and directives. Blood pressure, oxygen saturation, and pain were evaluated. When the studies were examined, it was reported that no allergic reactions were observed regarding lavender and peppermint oils (Yaylı, 2013; Tisserand and Young, 2014; Ergin et al., 2016; Silva et al., 2015; Zhang et al., 2020; Varlı et al., 2020;). That is why no trial application was made. The experimental group patients were observed meticulously during the application, but no allergic reactions were observed. Afterward, the patients in this group were massaged for fifteen minutes on the forehead, shoulder, and root of the neck with a mixture of peppermint and lavender essential oil diluted with almond oil. After 30 minutes of medical treatment and massage, blood pressure, oxygen saturation, and pain were reevaluated, and "24-Hour Migraine Quality of Life Scale" was performed. Massage technique was shown to the patient relatives of the experimental group. They were asked to massage the patient's forehead, temple, and root of the neck for 3 weeks, three times a week for 15 minutes. For this purpose, 15 mL aromatic oil was given to the experimental group. Three weeks later, all patients were contacted by telephone and 24-Hour Migraine Quality of Life Scale was re-administered.

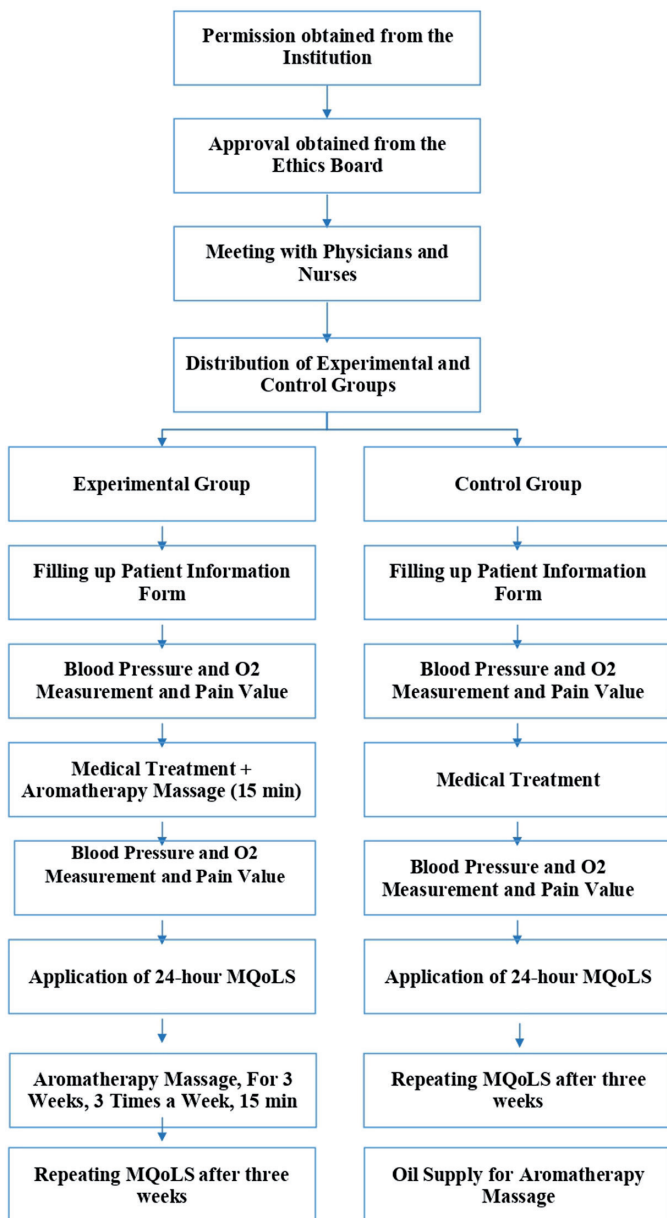
**Data Collection Tools**

**Patient Information Form**

The patient information form prepared by the researcher in accordance with the literature, consists of two parts. In the first part, there are six questions regarding the demographic features of the patient (gender, age, education level, occupation and its characteristics, phone, and address information in terms of accessibility). The second part contains information about the disease characteristics and the treatment.

**24-Hour Migraine Quality of Life Scale**

The scale was developed by Santanello et al. (1995) to determine the short-term changes in the quality of life of individuals with migraine (İltuğ & Karadakovan, 2008). The scale measures the change in quality of life for 24 hours after medication to relieve migraine headache. The adaptation studies for the Turkish society were conducted by İltuğ and Karadakovan in 2007. There are 15 questions in total on the 7-point Likert scale. The scale has five domains including migraine symptoms, emotions-concerns, work functioning, social functioning, and energy-vitality for the quality of life each with three items. According to the severity of the emotions, thoughts or behaviors expressed by the items, the scale is scored between 7 points, for never, and 1 point for always. A minimum of 3 points and a maximum of 21 points can be obtained from each quality-of-life domain. The total score is between minimum 15 and maximum 105. It is determined that the higher the scores obtained from the scale, the higher the individual's quality of life and the lower the score, the lower the quality of life. İltuğ and Karadakovan found the Cronbach alpha coefficient of the scale as 0.90 for the total scale. In the study, Cronbach alpha coefficient of internal consistency was found to be 0.94 before application and 0.90 after application.



**Figure 1.**  
Consort Flow Diagram.

### Visual Analogue Scale

The scale developed by Price et al. (1983), is used to quantify the intensity and level of. On a 10 cm ruler indicating painless on one end and severe pain on the other, the patient marks his/her own pain level. According to this scale, 0–2 means no pain, 2–4 mild pain, 4–6 moderate pain, 6–8 severe pain, 8–10 very severe or intolerable pain.

### Procedure

Lavender, peppermint, and almond oil were used in the study because of their effect on different pain types (Meriçli et al., 2017; Sert & Özer, 2022). Essential oils should be used after they have been diluted in a carrier oil that nourishes and softens the skin and prevents skin irritation. Although there are various methods for the supply and preparation of essential oils, the most recommended method is the use of lavender, peppermint, and almond oil obtained by supercritical CO<sub>2</sub> extraction (Meriçli et al., 2017). The oil mixture was prepared by the researcher with a formula in a dim environment at room temperature. The mixtures were put into 15 mL, tightly capped, dark-colored bottles. Oil mixtures were stored in a glass-free operation cabinet in a hospital environment, remaining dark and cool.

Essential oil mixture ratios were prepared in line with the literature. During the massage, essential oils were diluted and applied with carrier oils. Carrier oils are emollient and have a distinctive scent. Soy, sesame, almond, wheat, and avocado oils are commonly used as carrier oils (Tatlı, 2012; Tisserand and Young, 2014). Essential oils are generally mixed with carrier oils at a ratio of 1–5%, and should not exceed 10%. For example, massage oil can be obtained by mixing 10 drops of Oleum Pini and Oleum Eucalypti into 120 mL of sesame oil. Since essential oils will evaporate quickly, mixtures should be freshly prepared and in small quantities (Buckle, 2015; Nazzaro et al., 2020; Tatlı, 2012; Snyder et al., 2014; Ulusoy et al., 2015). When exposed to air and sunlight, mixtures can oxidize and darken. Therefore, they should be stored in amber glass bottles (15–20 mL), in a dry and cool environment. The oils used in the study were prepared in 15 cc size bottles and stored tightly closed in a dry and cool environment (Buckle, 2015; Nazzaro et al., 2020; Tatlı, 2012). Lavender, peppermint, and almond oils obtained by supercritical CO<sub>2</sub> extraction were used in the study, and their volatile compositions was determined by GC-MS (Taşkor Önel and Yaman Akbay, 2022; Ulusoy et al., 2015). The mixture was prepared by adding lavender and peppermint essential oils at a ratio of 1:1 to 120 cc of carrier almond oil (Nasiri et al., 2022; Rasoolia et al., 2016; Taşkor Önel and Yaman Akbay, 2022).

### Statistical Analysis

For the evaluation and statistical analysis of data, The Statistical Package for Social Sciences version 22.0 software (IBM Corp.; Armonk, NY, USA) was used. The suitability of the variables to the normal distribution was evaluated by Shapiro–Wilks test and the data were not found to conform to the normal distribution. In addition to descriptive statistical methods (mean, standard deviation, frequency), Mann–Whitney *U*-test was used to evaluate the quantitative data between two groups showing normal distribution. Kruskal–Wallis test was used for evaluations between more than two groups and Mann–Whitney

*U*-test was used for the determination of the group causing the difference. Wilcoxon signed-ranks test was used to evaluate the quantitative data before and after the treatment. Chi-square test, continuity (Yates) correction, and Fisher's exact test were used to evaluate the qualitative data. Significance level was accepted as  $p < .05$ .

### Ethical Considerations

Permission was obtained from the scale owners and the institution before the study. Approval was obtained from the Non-Interventional Clinical Research Ethics Board of a University, Faculty of Medicine (Approval no: 05; Date: April 11, 2017).

### Results

Demographic and disease characteristics of the patients are presented in Table 1. 60% of the patients in the control group were female and 71.4% were housewives while 88.6% of the experimental group were female and 37.1% were housewives and it was determined that the difference between the groups was statistically significant. In addition, 60.0% of participants in the control group were female, 31.4% were primary school graduates, 42.9% were from other jobs, 65.7% had irregular timing of diurnal pain onset, 60.0% were drug naive, 51.4% took painkillers before applying to emergency service (Table 1). 88.6% of participants in the study group were female, 42.9% were primary school graduates, 71.4% were housewives, 54.3% had irregular timing of diurnal pain onset, 65.7% were drug naive, and 51.4% took painkillers before applying to emergency service (Table 1). In addition, it was clear that patients were similar in terms of disease characteristics ( $p > .05$ ). Control and study were similar in terms of demographic characteristics, excluding sex and occupation ( $p > .05$ ).

The assessment of patients' VAS scores is given in Table 2. It was found that the VAS scores of the experimental group obtained from the first assessment were significantly higher than the control group ( $p = .03$ ;  $p < .05$ ). In both experimental and control group, the difference of VAS scores between the first and the second assessment were found to be statistically significant. When the groups were compared according to the differences between the first and last assessment scores, the difference was found to be statistically significant.

Table 3 is related to the evaluation of the quality-of-life scale of the research groups. The total and subscale scores of the experimental group after aromatherapy massage were found to be significantly higher than the control group ( $p < .05$ ). In the evaluation of the experimental group three weeks after the application, it was observed that, compared to the first application scores, the increase in Emotions–Concerns, Work Functioning, Social Functioning and Energy–Vitality subscales and total scores were statistically significant ( $p < .05$ ).

### Discussion

Migraine headache is an important public health problem that should be emphasized with its severity, its impact on quality of life, the need for intensive drug therapy, increasing health costs and multifaceted harm to society (Yavuz et al., 2013).



**Table 1.**  
Demographic Characteristics of the Patients (n = 70)

Characteristics		Experimental (n = 35) n (%)	Control (n = 35) n (%)	$\chi^2$	p
Gender	Female	31 (88.6)	21 (60)	7.479	.013*
	Male	4 (11.4)	14 (40)		
Education	Literate	9 (25.7)	5 (14.3)	6.325	.173
	Primary school	15 (42.9)	11 (31.4)		
	Secondary/high School	4 (11.4)	11 (31.4)		
	University	7 (20)	8 (22.9)		
Occupation	Housewife	25 (71.4)	13 (37.1)	11.789	.002**
	Officer	7 (20)	7 (20)		
	Other jobs	3 (8.6)	15 (42.9)		
Start of the pain during the day	Irregular	19 (54.3)	23 (65.7)	2.764	.664
	Morning	4 (11.4)	2 (5.7)		
	Noon	5 (14.3)	5 (14.3)		
	Evening	5 (14.3)	5 (14.3)		
	Night	2 (5.7)	0 (0)		
Previous treatment	Yes	12 (34.3)	14 (40)	0.245	.805
	No	23 (65.7)	21 (60)		
Taking painkillers before coming to the emergency room	Yes	18 (51.4)	18 (51.4)	0.001	1.000
	No	17 (48.6)	17 (48.6)		

Note: \*p < .05.

\*\*p < .01.

In the literature, some studies recommended massage with aromatherapy to relieve pain, and stress and provide relaxation in different sampling groups (Wu et al., 2014). Aromatherapy applications through massage are becoming more and more common especially to decrease pain severity, make the patient pain-free and improve the quality of life (Ergin et al., 2016; Shin et al., 2016).

There are many studies in which aromatherapy massage is applied in different areas related to pain, stress, and relaxation (Yavuz et al., 2013). Aromatherapy through massage is

becoming more common, especially to prevent pain, reduce its severity, and improve the quality of life (Ergin et al., 2016; Shin et al., 2016; Snyder et al., 2014; Wu et al., 2014). Aromatherapy can be used as a complementary and supportive treatment to relieve pain and improve the quality of life in migraine (Snyder et al., 2014; Wu et al., 2014).

In the study, most of the patients in both groups were female (Table 1). The literature and clinical experience suggest that the females had a higher prevalence of migraine. It is stated that the prevalence of migraine is 15–25% in females and 6–9% in males; when the general situation in our country is examined, it is 16% in total, 25% in females and 9% in males (Ulusoy et al., 2015). This difference is thought to be due to hormonal changes in women (Özden et al., 2015). The study findings are similar to the literature, 60% of patients in the control group and 88.6% of patients in the study group were female, a statistically significant finding (Nasiri et al., 2022; Rasoolia et al., 2016) (Table 1).

Studies on aromatherapy are mostly related to the effect of aromatherapy on anxiety and pain (Sert & Özer, 2022; Wu et al., 2014). Similar study on the effect of lavender and peppermint oil mixtures on migraine pain has not been found in the literature. But the effect of lavender and peppermint oil on different pain types has been proven (Meriçli, 2014).

In the study planned and carried out considering the literature and other study results, it was found that in addition to

**Table 2.**  
Assessment of Patients' VAS Scores (n = 70)

VAS	Experimental (n = 35) M ± SD	Control (n = 35) M ± SD	Z	p <sup>a</sup>
First assessment	9.26 ± 0.95	8.54 ± 1.69	-2.164	.03*
Second assessment	3.57 ± 1.38	3.94 ± 1.53	-0.990	.322
Difference	-5.69 ± 1.32	-4.60 ± 2.06	-2.927	.003**
Z and p <sup>b</sup>	Z = -5.200 p = .001**	Z = -4.861 p = .001**		

Note: <sup>a</sup>Mann-Whitney U-test.

<sup>b</sup>Wilcoxon signed-ranks test.

\*p < .05.

\*\*p < .01.

**Table 3.**  
Evaluation of Patients' 24-Hour Migraine Quality of Life Scale Scores Before and After the Application (n = 70)

Scale and Subscales	Evaluation	Experimental (n = 35) M ± SD	Control (n = 35) M ± SD	Z	p <sup>a</sup>
Symptoms of migraine	First evaluation <sup>c</sup>	14.11 ± 5.23	13.06 ± 5.64	-0.843	.399
	Second evaluation <sup>d</sup>	15.37 ± 4.41	12.43 ± 5.25	-2.304	.021*
	Difference	1.26 ± 5.84	-0.63 ± 5.66	-1.632	.103
	Z	-1.539	-0.801		
	p <sup>b</sup>	.124	.423		
Emotions-concerns	First evaluation <sup>c</sup>	7.80 ± 6.21	6.14 ± 4.21	-0.347	.729
	Second evaluation <sup>d</sup>	11.86 ± 6.26	8.60 ± 5.48	-2.163	.031*
	Difference	4.06 ± 9.55	2.46 ± 5.39	-1.766	.077
	Z	-2.294	-2.407		
	p <sup>b</sup>	.022*	.016*		
Work functioning	First evaluation <sup>c</sup>	12.40 ± 6.43	11.60 ± 6.61	0.395	.693
	Second evaluation <sup>d</sup>	14.94 ± 4.83	11.77 ± 5.67	-2.243	.025*
	Difference	2.54 ± 7.36	0.17 ± 5.15	-1.419	.156
	Z	-1.843	0.000		
	p <sup>b</sup>	.065	1.000		
Social functioning	First evaluation <sup>c</sup>	10.83 ± 6.68	10.51 ± 6.78	-0.290	.772
	Second evaluation <sup>d</sup>	14.29 ± 5.24	10.60 ± 5.55	-2.679	.007**
	Difference	3.46 ± 7.47	0.09 ± 4.76	-2.037	.042*
	Z	-2.473	-0.503		
	p <sup>b</sup>	.013*	.615		
Energy-vitality	First evaluation <sup>c</sup>	9.46 ± 6.55	9.57 ± 6.50	-0.030	.976
	Second evaluation <sup>d</sup>	12.89 ± 6.25	9.09 ± 5.77	-2.562	.011*
	Difference	3.43 ± 6.68	-0.49 ± 5.73	-2.652	.008**
	Z	-2.865	-0.586		
	p <sup>b</sup>	0.004**	0.558		
Total	First evaluation <sup>c</sup>	54.60 ± 26.47	50.89 ± 23.92	-0.458	.647
	Second evaluation <sup>d</sup>	69.34 ± 23.10	52.49 ± 23.92	-2.785	.005**
	Difference	14.74 ± 30.59	1.60 ± 17.17	-2.420	.016*
	Z	-2.531	-0.060		
	p <sup>b</sup>	.011*	.952		

Note: <sup>a</sup>Mann-Whitney U-test.<sup>b</sup>Wilcoxon signed-ranks test.<sup>c</sup>During the application.<sup>d</sup>Three weeks after the application.

\*p &lt; .05.

\*\*p &lt; .01.

the medical treatment given, the experimental group patients had a significant decrease in VAS pain scores when aromatic oil mixture was applied to the forehead, temple and root of the neck for 15 minutes ( $p < .05$ ) (Table 2). There was also a significant decrease in VAS scores of the control group ( $Z = -4.861$ ;  $p = .001$ ). This is an expected result. Because both groups received medical treatment. The aim of complementary therapies is to support individual's relaxation and

reduction of the effect of symptoms in addition to medical treatment (Unal & Akpinar, 2016; Saade et al., 2021). The result showing the effectiveness of the application is that the decrease in the VAS pain scores of the experimental group patients is higher ( $Z = -2.927$ ;  $p = .003$ ) (Table 2). This finding is an indication that massage with aromatic oils affects and reduces the pain intensity in individuals experiencing acute migraine attacks.

Rasoolia et al. (2016), in their study with three different groups each including 30 patients, compared the pain and anxiety scores of the aromatherapy massage group with lavender and almond oil mixture with the aromatherapy inhalation group and control group and concluded that pain scores of patients with aromatherapy massage considerably decreased compared to other groups (Rasoolia et al., 2016).

In a study with dialysis patients, Unal and Akpınar (2016) demonstrated that back massage and reflexology massage on the feet could ease fatigue and pain.

In another study on pain, 90 elderly patients with knee pain due to osteoarthritis were massaged with lavender essential oil and the severity of pain decreased significantly by the end of the first week compared with the control group (Nasiri et al., 2016).

Apay et al. (2012), in their study with midwifery and nursery students, found that massage with lavender oil could reduce dysmenorrhea.

In addition to medical treatment in migraine headaches, making complementary and supportive treatment methods widespread and the use of aromatherapy a life-long habit will result in less drug consumption, reduced hospital admissions, and prolongation during migraine attacks. Assessment of the quality of life is of great importance in evaluating the response of migraine attacks to the treatment and choosing appropriate application (Ruiz de Velasco et al., 2003). Because migraine pain negatively affects the quality of life in many dimensions such as school absenteeism and failure, absenteeism and loss of workforce, social isolation, and unwillingness to engage in leisure activities (Arslantaş et al., 2013; Ruiz de Velasco et al., 2003). According to a study showing annual workday loss caused by migraine and other tension-type pain, 43% of working migraine patients and 12% of patients with tension-type headache were unable to go to work for at least one day and became inefficient more than 50% even if they go and the annual loss was between 1 and 7 days (İltuş & Karadakovan, 2008). It was stated that the annual total loss of working days is 270 days per 1000 people (İltuş & Karadakovan, 2008) Supporting these findings, it was suggested in many studies that migraine lowers a patient's quality of life (Özden et al., 2015; Ulusoy et al., 2015).

In the study, it was seen that the quality of life mean scores of the patients in both experimental and control groups were not good considering that the highest score to be taken from the scale was 105 (Table 3). Studies have reported that migraine reduces the productivity, efficiency, and quality of life of an individual (Taşkapılıoğlu & Karlı, 2013). In the study conducted by Erdemoğlu et al. (2014), it is stated that migraine and all types of headaches reduce the quality of life by restricting the individual's social activities. Arslantaş et al. (2013), in their studies in which they evaluated health-related quality of life, demonstrated that increased severity of migraine and headaches decreases the quality of life.

No significant difference was detected between the experimental and control groups in the initial quality of life assessment ( $Z = -0.458$ ,  $p = .647$ ). Migraine-related quality of life was

not good in both groups. However, the quality-of-life mean scores of the experimental group after aromatherapy massage three times a week for three weeks, increased significantly in both total and three subscales ( $Z = 2.531$ ;  $p = .003$ ). There was no difference in the quality of life of the control group. Massage in the home environment with aromatic oils had a positive effect on the quality of life of the patients.

### Study Limitations

The study was conducted only in patients diagnosed with migraine who came to the emergency clinic with pain. Therefore, it could not be studied with a larger sample group. Additionally, the data of our study were collected after three weeks, and the patients could not be followed for at least three months. Another limitation of this study is that patient relatives might not be able to adequately apply these techniques after only a single training session.

### Conclusion and Recommendations

In this study, it was seen that there were significant differences in pain and quality of life in patients treated with and without aromatherapy massage as a supportive treatment for migraine. It was proven that in addition to medical treatment, a 15-minute massage with aromatic oil mixtures on the forehead, temple, and root of the neck three times a week for three weeks reduces migraine pain; increases quality of life. According to the results of our study, massage with aromatic oils is potentially useful in patients with migraine.

The results of the study show that aromatherapy practices have an important place in the field of nursing. Developments in health and access to scientific knowledge have prompted important changes in the roles and responsibilities of nurses. Nurses have made significant progress in aromatherapy practices, which is a complementary and supportive initiative. The use of aromatherapy in nursing dates back to the 1850s during the time of Florence Nightingale and the Crimean War. Massage applications with lavender oil applied to the forehead of wounded soldiers during the war form the basis of nursing and aromatherapy. In today's patient care, aromatherapy applications have become an important area of responsibility for nursing to improve care, ensure and accelerate healing, facilitate human-environment interaction, and strengthen the profession. Aromatherapy has been used in nursing care for centuries with safe traditional practices, and is based on strong evidence that is supported by evidence-based practices. One of the important developments in nursing and aromatherapy practices is that they are accepted as a nursing intervention and included in the NIC (Nursing Interventions Classification) nursing interventions classification system.

For nurses to practice aromatherapy, they have important responsibilities, such as knowing the method of application, defining the properties of carrier and essential oils, knowing the density of the oils and choosing the appropriate oil, defining their effects, deciding on the frequency and duration of applying the mixing ratios and ways of obtaining them, observing the change in the patient and revealing the results, directing individuals to the correct applications, and providing

effective counseling (Taşkor Öner and Yaman Akbay, 2022; Turan et al., 2010).

Nursing and aromatherapy practices should be developed and used more in the care practices. For this reason, it would be beneficial to include more of these practices in nursing curricula, to provide training to nurses on this subject, to ensure it widespread, and to support nurses for correct and effective aromatherapy practices.

**Ethics Committee Approval:** Approval was obtained from the Non-Interventional Clinical Research Ethics Board of a Van Yüzüncü Yıl University, Faculty of Medicine (Approval no: 05; Date: April 11, 2017). The current study was conducted in line with the Declaration of Helsinki.

**Informed Consent:** Informed consent form was obtained from patients participating in the current study.

**Peer-review:** Externally and internally peer-reviewed.

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## References

- Apay, S. E., Arslan, S. A., Akpınar, R. B., & Celebioglu, A. (2012). Effect of aromatherapy massage on dysmenorrhea in Turkish students. *Pain Management Nursing*, 13(4), 236–240. [CrossRef]
- Arslantaş, D., Tozun, M., Unsal, A., & Ozbek, Z. (2013). Headache and its effects on health-related quality of life among adults. *Turkish Neurosurgery*, 23(4), 498–504. [CrossRef]
- Consort (2010). CONSORT 2010 checklist of information to include when reporting a randomised trial. Retrieved from [https://legacyfileselsevier.com/promis\\_misc/CONSORT-2010-Checklist.pdf](https://legacyfileselsevier.com/promis_misc/CONSORT-2010-Checklist.pdf)
- Erdemoğlu, A. K., Domaç, F. M., & Karaçam, M. (2014). Başağrısında yaşam kalitesi ve ölçümü [Quality of life and its measurement in headache]. *Turkish Journal of Neurology*, 20(1), 53–56. [CrossRef]
- Ergin, E., Arslan, G. G., Yüce, Ş. Ç., & Ayçemen, N. (2016). Effects of aromatherapy on anxiety and vital signs of the elderly living in nursing homes. *Spatula DD-Peer Reviewed Journal of Complementary Medicine and Drug Discovery*, 6(1), 1.
- İltuş, F., & Karadakovan, A. (2008). The reliability and validity of Turkish form of 24-hour migraine quality of life questionnaire. *Archives of Neurology and Psychiatry*, 3, 59–63.
- Meriçli, F. (2014). Phytotherapy in Turkey and the plants of Turkey as source of herbal medicinal products. Fourth International Meeting on Pharmacy & Pharmaceutical Sciences (IMPPS-4); Istanbul, Turkey.
- Mericli, F., Becer, E., Kabadayı, H., Hanoglu, A., Yigit Hanoglu, D., Ozkum Yavuz, D., Ozek, T., & Vatanserver, S. (2017). Fatty acid composition and anticancer activity in colon carcinoma cell lines of *Prunus dulcis* seed oil. *Pharmaceutical Biology*, 55(1), 1239–1248. [CrossRef]
- Nasiri, A., Mahmodi, M. A., & Nobakht, Z. (2016). Effect of aromatherapy massage with lavender essential oil on pain in patients with osteoarthritis of the knee: A randomized controlled clinical trial. *Complementary Therapies in Clinical Practice*, 25, 75–80. [CrossRef]
- Nasiri, M., Asayesh, H., Yousefi Khosroabadi, Z., Hosseini Amiri, M., Bahadori, H., & Rajaei, M. (2022). Effects of aromatherapy with lavender (*Lavandula angustifolia* MILL) on post-dural puncture headache: A randomized placebo-controlled trial. *Alternative Therapies in Health and Medicine*, 28(5), 12–19. Retrieved from <http://www.alternative-therapies.com/pdfarticles/62791.pdf>
- Nazzaro, F., De Martino, L., Fratianni, F., & De Feo, V. (2020). Chapter 49. Essential oils from Mediterranean aromatic plants. In V. R. Preedy & R. R. Watson (Eds.). *The Mediterranean diet* (2nd ed) (pp. 555–564). Cambridge: Academic Press. [CrossRef]
- Özden, S. Y., Baykan, B., & Ertekin, E. (2015). Investigation of obsessive-compulsive symptoms in patients with migraine. *Pain*, 27(1), 18–25. [CrossRef]
- Price, D. D., McGrath, P. A., Rafii, A., & Buckingham, B. (1983). The validation of visual analogue scales as ratio scale measures for chronic and experimental pain. *Pain*, 17(1), 45–56. [CrossRef]
- Ruiz de Velasco, I., González, N., Etxeberria, Y., & Garcia-Monco, J. C. (2003). Quality of life in migraine patients: A qualitative study. *Cephalalgia*, 23(9), 892–900. [CrossRef]
- Saade, H., de León-Gómez, R. D., Treviño, M. E., Rodríguez-Fernández, O. S., Soriano-Corral, F., Borjas, J. J., Castellanos, F., Enríquez-Medrano, F. J., Valdez, J. A., & López, R. G. (2021). Performance of cotton, cotton-polyester, and polyester-elastane fabrics impregnated with ultrafine polymeric nanoparticles loaded with lavender oil. *Journal of Nanomaterials*, 10, 6665327. [CrossRef]
- Santanello, N. C., Hartmaier, S. L., Epstein, R. S., & Silberstein, S. D. (1995). Validation of a new quality of life questionnaire for acute migraine headache. *Headache*, 35(6), 330–337. [CrossRef]
- Sasannejad, P., Saeedi, M., Shoeibi, A., Gorji, A., Abbasi, M., & Foroughipour, M. (2012). Lavender essential oil in the treatment of migraine headache: A placebo-controlled clinical trial. *European Neurology*, 67(5), 288–291. [CrossRef]
- Sert, M., & Özer, Z. (2022). Baş ağrısı yönetiminde lavanta yağının etkinliği: Sistematik derleme [Effectiveness of lavender oil in headache management: A systematic review]. *Akdeniz Nursing Journal*, 1(1), 19–28. Retrieved from <https://dergipark.org.tr/en/download/article-file/2359346>
- Seyyed-Rasooli, A. S., Salehi, F., Mohammadpoorasl, A., Goljaryan, S., Seyyedi, Z., & Thomson, B. (2016). Comparing the effects of aromatherapy massage and inhalation aromatherapy on anxiety and pain in burn patients: A single-blind randomized clinical trial. *Burns*, 42(8), 1774–1780. [CrossRef]
- Shin, E. S., Seo, K. H., Lee, S. H., Jang, J. E., Jung, Y. M., Kim, M. J., & Yeon, J. Y. (2016). Massage with or without aromatherapy for symptom relief in people with cancer. *Cochrane Database of Systematic Reviews*, 2016(6), CD009873. [CrossRef]
- Silva, G. L., Luft, C., Lunardelli, A., Amaral, R. H., Melo, D. A. S., Donadio, M. V. F., Nunes, F. B., De Azambuja, M. S., Santana, J. C., Moraes, C. M. B., Mello, R. O., Cassel, E., Pereira, M. A. A., & de Oliveira, J. R. (2015). Antioxidant, analgesic and anti-inflammatory effects of lavender essential oil. *Anais da Academia Brasileira de Ciências*, 87(2) Suppl., 1397–1408. [CrossRef]
- Snyder, M., Lindquist, R., & Niska, H. (2014). Evolution and use of complementary and alternative therapies. In R. Lindquist, M. Snyder & M. F. Tracy (Eds.). *Introduction to complementary and alternative therapies in nursing* (7th ed). Springer.
- Taşkapılıoğlu, Ö., & Karlı, N. (2013). Assessment of quality of life in migraine. *Archives of Neurology and Psychiatry*, 50(1), 60–74. [CrossRef]
- Taşkor Önel, G., & Yaman Akbay, H. G. (2022). Uçucu ve sabit yağlar: Kimyasal yapı-aktivite ilişki değerlendirmesi [Essential and fixed oils: Evaluation of chemical structure-activity relationship]. *Bayburt Üniversitesi Fen Bilimleri Dergisi*, 5(1), 104–114. [CrossRef]
- Tatlı, İ. İ. (2012). Doğal aromaterapötik yağlar ile cilt terapisi [Skin therapy with natural aromatherapeutic oils]. *Türkiye Klinikleri Cosmetic Dermatology*, 5(4), 46–53.
- Tisserand, R., & Young, R. (2014). *Essential oils safety* (2nd ed). Churchill Livingstone Elsevier.
- Turan, N., Öztürk, A., & Kaya, N. (2010). Hemşirelikte yeni bir sorumluluk alanı: Tamamlayıcı terapi [A new area of responsibility in nursing: Complementary therapy]. *Maltepe University Journal of Nursing Science and Art*, 3(1), 93–98.
- Üçler, S. (2018). Migren ve gerilim tipi baş ağrılarında patofizyoloji [Pathophysiology of migraine and tension-type headache]. *Türkiye Klinikleri Neurology - Special Topics*, 11, 1, 21–27.



Ulusoy, E. K., Ayar, E., Bayındırlı, D., & Yön, M. İ. (2015). Kronik migrenli kadın hastalarda dissosiyatif belirtiler prevalansı ve depresyon-anksiyete ile ilişkisi [Prevalence of dissociative symptoms in female patients with chronic migraine, and its relationship with depression-anxiety]. *Selçuk Medical Journal*, 31(2), 65–68. Retrieved from <https://www.selcukmedj.org/uploads/publications/SUTD-669.pdf>

Unal, K. S., & Balci Akpınar, R. B. (2016). The effect of foot reflexology and back massage on hemodialysis patients' fatigue and sleep quality. *Complementary Therapies in Clinical Practice*, 24, 139–144. [CrossRef]

Unger, J. (2006). Migraine headaches: A historical prospective, a glimpse into the future, and migraine epidemiology. *Disease-A-Month*, 52(10), 367–384. [CrossRef]

Varlı, M., Hancı, H., & Kalafat, G. (2020). Tıbbi ve aromatik bitkilerin üretim potansiyeli ve biyoyararlılığı [Production potential and bioavailability of medicinal and aromatic plants]. *Research Journal of Biomedical and Biotechnology*, 1(1), 24–32. Retrieved from <https://dergipark.org.tr/en/download/article-file/1238637>

Wu, J. J., Cui, Y., Yang, Y. S., Kang, M. S., Jung, S. C., Park, H. K., Yeun, H. Y., Jang, W. J., Lee, S., Kwak, Y. S., & Eun, S. Y. (2014). Modulatory effects of aromatherapy massage intervention on electroencephalogram, psychological assessments, salivary cortisol and plasma brain-derived neurotrophic factor. *Complementary Therapies in Medicine*, 22(3), 456–462. [CrossRef]

Yavuz, K. F., Yavuz, N., Ulusoy, S., Alniak, İ., Hafize, N., & Güneş, H. N. G. (2013). Gerilim ve migren tipi baş ağrılarına eşlik eden işlevsel olmayan bilişsel içerikler ve tutumlar / Maladaptive cognitive content and attitudes accompanying tension type headache and migraine. *Düşünen Adam*, 26, 12–21. [CrossRef]

Yaylı, N. (2013). *Essential oils and medical uses. I. Production of pharmaceutical chemistry, technology, Standardization Congress*, 29–31, March, Antalya Turkey.

Zhang, T., Luo, Y., Wang, M., Chen, F., Liu, J., Meng, K., & Zhao, H. (2020). Double-layered microcapsules significantly improve the long-term effectiveness of essential oil. *Polymers*, 12(8), 1651. [CrossRef]