



A Comparative Study of Chamomile Oil and Sesame Oil on Chronic Low Back Pain: A Randomized, Double-Blinded, Controlled Clinical Trial

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Abstract

Chronic low back pain (LBP) is common disorder among nurses. The present study compared the effect of rubbing joint oil (chamomile oil product) and sesame oil on the control of chronic LBP in nurses. This study was a double-blind randomized clinical trial conducted on 74 nurses with chronic LBP. The samples were divided into two groups using the randomization method. In the first group, joint oil (chamomile oil product), and in the second group, sesame oil was rubbed twice a day for three weeks. The pain severity was assessed using a visual analog scale before, one, two, three, and four weeks after the intervention. The second outcomes including absenteeism and satisfaction with treatment were also assessed in two groups. Moreover, the mean pain severity decreased, and in both groups, the effect of rubbing both oils was the same after the first week and this effect continued after the fourth week ($P < 0.05$). There was no statistically significant difference between both groups in terms of absenteeism ($P > 0.05$) and both groups were satisfied (62.2%) with the effects of oil rubbing. Rubbing joint oil (Chamomile oil product) and Sesame oil is a simple and non-invasive method for controlling LBP. Although the effects of rubbing both oils on pain control were the same, the consequences of low back pain control with rubbing oil were significant.

Keywords: Chamomile oil; Sesame oil; Chronic low back pain; Nurses; Rubbing

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Introduction

Low back pain (LBP) is an important and common problem in musculoskeletal disorders [1,2]. The annual prevalence of LBP is 45% to 75% among health care providers [3]. Implementing some nursing interventions such as transporting and changing patients' positions, prolonged standing, performing the task without adequate resting increases the prevalence of LBP in nurses [4-6]. LBP affects all aspects of life and results in lower quality of life [7,8]. It has been currently reported as the leading cause of job loss and absenteeism at work in nurses [9]. Various therapeutic approaches such as pharmacological and non-pharmacological treatments such as complementary and alternative medicine have been used to manage this disorder [10]. One of the non-pharmacological approaches is the use of herbal therapies that have been used for centuries to reduce pain and inflammation [11,12].

Various studies have used different types of oils for various purposes such as reducing the severity of chronic LBP in elderly people [13]. Non-pharmacological therapies such as massage therapy or aromatherapy have also been used to reduce LBP [14,15]. In the Avicenna's Canon of Medicine, written by Avicenna, 650 herbal species have been reported to have anti-inflammatory and analgesic properties and various clinical studies have supported using them. Chamomile and sesame are among these herbs [16]. In complementary medicine, sesame oilseed, having the scientific name *Sesamum indicum*, is one of the oils that have been used to relieve pain and even mitigate labor pain [17]. Sesame oil has antioxidant and preventive

properties against degenerative diseases [18]. Chamomile, having the scientific name *Matricaria recutita*, is another medicinal herb that is considered as one of the oldest and mostly-used medicinal herbs in the world and is extensively used due to its analgesic, antimicrobial and antispasmodic effects [19]. In addition to the local use, oral use of these two types of oils has also been proved to relieve the pain. Khatami et al., reported the effect of short-term chamomile distillate on muscle soreness [20]. In the study conducted by Mohammadian et al., the effects of using sesame seed on improving the severity of primary dysmenorrhea were examined [21]. Various sources have referred to the analgesic and anti-inflammatory effects of chamomile and sesame oils, but no study was found to examine the effects of these oils on LBP and compare the effects of them on the pain control. The main question of this study was which of these oils is more effective in reducing the LBP of nurses. Hence, the present research was conducted to compare the analgesic effects of the sesame oil and joint oil (chamomile oil product) in reducing chronic LBP in the nurses to identify the most effective oil and recommend it as a non-pharmacological method to improve the quality of life of nurses with LBP.

Methods

The present study was a double-blind randomized clinical trial conducted on 74 nurses with chronic LBP. The sample size was calculated at 34 individuals in each group with a test power of 80% and a confidence level of 95%. Finally, the sample size was determined to include

37 individuals in each group, considering the probability of a 10% attrition in samples; based on a similar study [22] and using the following formula:

$$n = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 \times (\sigma_1^2 + \sigma_2^2)}{d^2}$$

$$Z_{0.975} = 1.96$$

$$Z_{0.8} = 0.84$$

$$d = 1.3$$

Inclusion criteria of the present study included:

- Age of 25 to 60 years
- Lack of spondylosis, lordosis, kyphosis, scoliosis
- Lack of malignancy in the spinal cords
- Chronic LBP (over 12 weeks)
- Not taking analgesic medicine or oils regularly
- Lack of chemotherapy, physiotherapy, corrective exercises, and hydrotherapy during the intervention
- No history of spine surgery.

Exclusion criteria of the present study also included:

- Unwillingness to continue participating in the study
- No intervention for more than two days
- Pregnancy

Accordingly, the researcher selected the eligible individuals, introduced herself, explained the objectives of the research, and obtained written informed consent based on the inclusion criteria. Samples were randomly divided into two groups according to the permuted block randomization method. The letter A was assigned to the chamomile oil (first group) and the let-

ter B was assigned to the sesame oil (second group). Accordingly, 37 draws for the random allocation of 74 people were performed.

The data collection tool was a researcher-made questionnaire including demographic information, and characteristics of pain (including factors leading to pain, the quality of pain, its site and spread, and the number of days of absenteeism at work). Visual analog scale (VAS) was used for assessing the severity of pain as well as the satisfaction of both groups using the Pain Treatment Satisfaction Scale one week after the intervention [23].

To determine the validity of the researcher-made questionnaire, library studies, opinions of supervisors, advisors, and ten faculty members of Tehran University of Medical Sciences were used. To determine the reliability of the tool, the Pearson correlation coefficient (0.83) was determined on ten nurses with chronic LBP for one week in a pilot study (It should be noted that these individuals were not included in the study (. The validity and reliability of VAS have been confirmed [24]. The method of intervention was in this way that in the chamomile oil group, 5 ccs of the joint oil (chamomile oil product) was rubbed on the back and on the area where the person was complaining of pain and around it. Then, with the palm of a hand and with gentle massage, the oil was rubbed on the skin of the area so that the oil remained on the surface of the skin and completely covered the area. There was no specific time for rubbing the oil and no pressure was applied on the skin or underneath tissues. In the present study, the chamomile product oil composed of chamomile

and fenugreek oil based on sesame oil and also *Trigonella foenum-graecum*.

In the sesame oil group, the same technique was applied, but the difference was that 5 ccs of sesame oil was used. The interventions were performed in two groups for three weeks and twice a day. The pain was assessed before the intervention and at the end of the first, second, and third weeks using the VAS scale. After three weeks, the subjects were asked not to use the oil for one week and then at the end of the fourth week, the severity of LBP was re-assessed and compared in each group and between the two groups. Descriptive and inferential statistics such as frequency distribution tables, numerical indices, chi-square test, paired t-test, and repeated measure ANOVA were used for data collection. The results were analyzed using SPSS, version 16, software.

Results

The mean and standard deviation of age were 37.05 ± 8.72 years in the chamomile oil group and 38.37 ± 9.00 years in the sesame oil group. There was no statistically significant difference between the two groups in terms of age ($P > 0.05$) and women had more LBP than men. The lumbar area was the most common site of LBP in both groups (78.4% in the first group and 70.3% in the second group) and the most common site for the spread of pain was the thigh (45.9% in the first group and 54.1% in the second group). Indeed, in both groups, the mean of pain severity decreased after the intervention in the first, second, third, and fourth weeks ($p < 0.0001$) (Table 1). The comparison of mean

pain severity in both groups before the intervention, one, two, three, and four weeks after the intervention showed a statistically significant difference ($p < 0.0001$) (Table 2). The results of the comparison of the mean pain severity in both groups showed that in the first group, the mean pain severity in the first week was not significantly different from that in the second, third, and fourth weeks ($p > 0.05$). Also, there was no difference between the mean of the second week and the means of the third and fourth weeks as well as between the mean of the third week and that of the fourth week ($p > 0.05$).

In the sesame oil group, the mean pain severity in the first week was not significantly different from that in the second week ($p < 0.05$), but there was a significant difference between the third and fourth weeks in this regard ($p < 0.05$). Mean pain severity in the second week was not significantly different from that in the third week ($p > 0.05$), but it was significantly higher compared to the fourth week ($p < 0.05$). Also, there was no significant difference between the mean pain severity of the third week and that of the fourth week ($p > 0.05$). In general, the comparison of mean pain severity in both groups before, one, two, three, and four weeks after the intervention indicated that there was no statistically significant difference between the two groups ($P > 0.05$) (Table 3). Before the intervention, absenteeism at work due to LBP was observed. Absenteeism was observed in the chamomile oil group with two individuals for 3 and 6 days, respectively, and in the sesame oil group having one individual for 4 days. Following the rubbing of oil in both groups, there

was no absenteeism at work in both groups. The nurses of both groups were satisfied with the treatment outcome and there was no statistically

significant difference between the two groups in this regard.

Table 1. Demographic information of participants

Characteristics	Chamomile oil group(n=37)		Sesame oil group(n=37)		Total sample (n=74)		P-value
	N	%	N	%	N	%	
Gender							
Female	32	86.48	32	86.48	64	86.48	
Male	5	13.51	5	13.51	10	13.51	
Age							
25-29	11	29.72	5	13.51	16	21.62	<0.05
30-34	5	13.51	10	27.02	15	20.27	
35-39	7	18.91	4	10.81	11	14.86	
40-44	6	16.21	9	24.32	15	20.27	
45 years and up	8	21.62	9	24.32	17	22.97	
Location of LBP							
Lumbar	29	78.37	26	70.27	55	74.32	
Sacrum	15	40.54	15	40.54	30	40.54	<0.05
Coccyx	12	32.43	12	32.43	24	32.43	
Location of LBP Radiation							
Thigh	17	45.9	20	54.1	37	50	
Leg	10	27	14	37.8	24	32.43	<0.05
Foot	5	13.51	8	21.62	13	17.56	

Table 2. The mean pain severity in the chamomile and sesame oil groups before, one, two, three and four weeks after the intervention

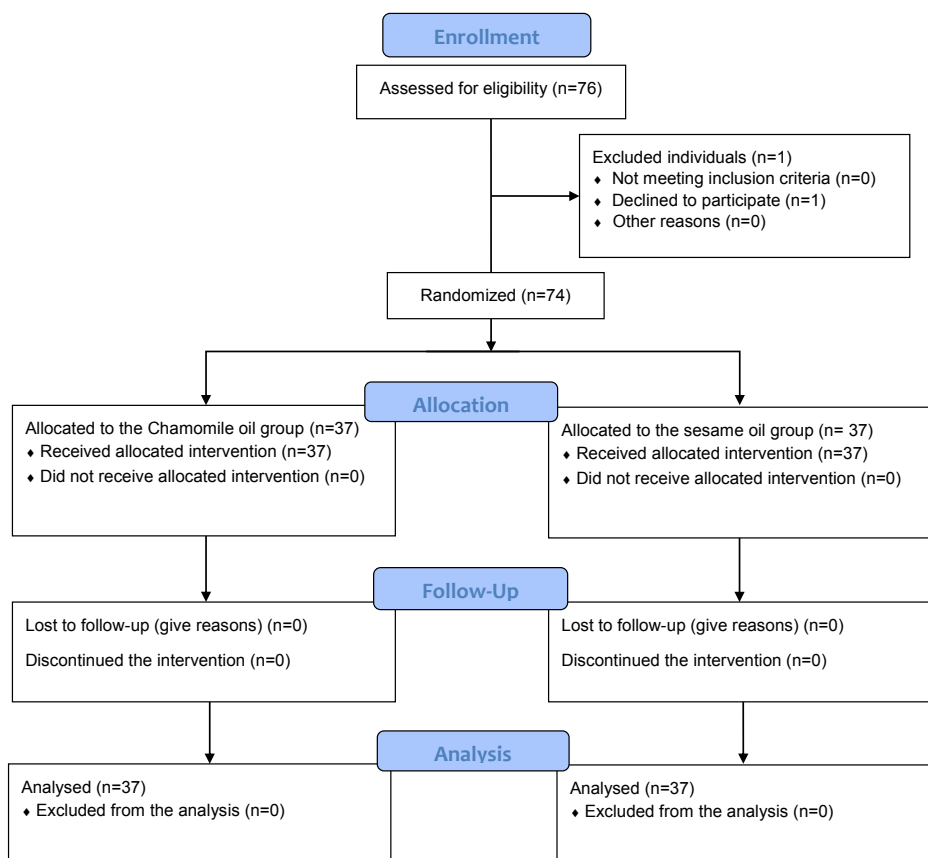
groups	Intervention time (Mean ± SD)					P value*
	Before	First week	Second week	Third week	Fourth week	
Chamomile oil group (n=37)	5.05±2.09	3.83±2.32	3.75±1.92	3.00±1.98	3.21±2.50	p<0.0001
Sesame oil group(n=37)	5.13±1.79	4.45±1.50	3.89±2.13	3.27±2.00	3.16±2.27	p<0.0001

*repeated measures ANOVA

Table 3. Comparison of the mean pain severity in the chamomile oil groups before, one, two, three and four weeks after the intervention

Intervntion Time (Mean±SD)	Weeks (Mean± SD)	*P- value
Before (5.05±2.09)	First week (1.21±0.31)	0.004
	Second week (1.29±0.32)	0.003
	Third week (2.05±0.39)	< 0.0001
	Fourth week (1.83±0.48)	0.006
First week (3.83±2.32)	Second week (0.08±0.32)	1.00
	Third week (0.8±0.38)	0.36
	Fourth week (0.62±0.50)	1.00
Second week (3.75±1.92)	Third week (0.75±0.29)	0.15
	Fourth week (0.54±0.45)	1.00
Third week (3.00±1.98)	Fourth week (0.21±0.34)	1.00

*Bonferroni



Discussion

As stated, the objective of this study was to compare the effects of rubbing of joint oil (chamomile oil product) and sesame oil on chronic LBP in nurses. The results showed that there was no significant difference between the mean pain severity in the two groups before the intervention and in each of the weeks after the intervention. In a study on patients with knee osteoarthritis, Shoara et al, evaluated the severity of pain using sesame-based chamomile oil and diclofenac gel and paraffin therapy three times a day for three weeks. The results revealed that there was no significant reduction in the pain severity of the two groups. The deep massage was used in the mentioned study [25], while oil rubbing was used in the present study. However, the results of these studies were consistent. The results also revealed the effect of pain reduction in the first week of intervention in the chamomile oil group. After the first week, there was no significant change in the pain severity during the second to fourth weeks. The results of this study were in line with the study conducted by Borges et al. in Brazil on nurses with LBP. In this study, massage and lasers were used twice a week for six weeks. Results revealed that pain in both groups showed a decreasing trend from the third week, but after the third week to the sixth week, pain decreased slowly. However, this value was not very significant in the laser group [26]. Non-significant decrease in the pain severity between the weeks can be justified by considering the immediate pain relief effect of chamomile [12]. Yang et al. used Chinese massage to control the chronic

LBP. Results revealed that mean pain severity at the fourth, sixth, and eighth weeks after the intervention was significantly reduced [15]. In a study conducted by Nazemizadeh et al. who used foot reflexology in male patients with chronic LBP for three weeks (once a week), the mean pain severity decreased in the third week after the intervention. Also, in the sixth week after the intervention, pain severity decreased significantly [27]. In the present study, the utilized time interval for assessing pain severity was different from that of the mentioned study, but two studies were similar in terms of the short-term effects of pain reduction. In a study conducted by Askari et al Patients with knee osteoarthritis were treated by topical sesame oil or diclofenac (three times a day) for 4 weeks. The severity of knee pain was measured by VSA scale and Patients were evaluated at baseline, 2 and then 4 weeks after the intervention. Sesame oil was not inferior to diclofenac regarding consumed analgesics [28]. In accordance with the present study, the effects of rubbing both oils on pain control were the same but the intervention time and sample size were less. The percentage of absenteeism at work was studied in the present study.

Results revealed that there was no absenteeism at work after the intervention in all groups. Borges et al. in Brazil investigated the effect of massage and laser on nurses and reported that the mean of absenteeism at work was 2.4 for one year [26]. In the present study, due to time limitations, absenteeism at work was assessed only over a two-month period. The difference between the results of the present study and

those of the mentioned study might be related to the investigation of absenteeism at work in a shorter time interval. Nowadays, it seems that presence at work can be more common despite the disease [29]. Another consequence of this intervention on nurses with LBP was their satisfaction with the pain relief effects of using chamomile oil and sesame oil. All of them were satisfied with this method. The results of the study conducted by Talali et al. also showed that patients were satisfied with the pain relief effects of using pepper ointment for three weeks and three times per day [30].

Table 4. Comparison of the mean pain severity in the sesame oil groups before, one, two, three and four weeks after the intervention

Intervention Time(Mean±SD)	Weeks (Mean± SD)	*P-value
Before (5.13±1.79)	First week (0.67±0.20)	0.02
	Second week (1.24±0.25)	< 0.0001
	Third week (1.86±0.28)	<0.0001.
	Fourth week (1.97±0.29)	< 0.0001
First week (4.45±1.50)	Second week (0.56±0.23)	0.19
	Third week (1.18±0.21)	< 0.0001
	Fourth week (1.29±0.25)	<0.0001
Second week (3.89±2.13)	Third week (0.62±0.25)	0.19
	Fourth week (0.73±0.22)	0.02
Third week (3.27±2.00)	Fourth week (0.10±0.27)	1.00

*Bonferroni

Table 5. Comparison of the mean pain severity in the chamomile and sesame oil groups before intervention, one, two, three and four weeks after the intervention

Intervention time	Chamomile oil group(n=37)	Sesame oil group(n=37)	
	Mean ± SD	Mean ± SD	*P-value
Before	5.05±2.09	5.13±1.79	0.85
	3.83±2.32	4.45±1.50	0.17
First week	3.83±2.32	4.45±1.50	0.17
Second week	3.75±1.92	3.89±2.13	0.77
Third week	3.00±1.98	3.27±2.00	0.56
Fourth week	3.21±2.50	3.16±2.27	0.92

*independent t test

Conclusions

The results of this study revealed the analgesic and anti-inflammatory effects of joint oil (chamomile oil product) and sesame oil without direct pressure. Rubbing oil at higher frequencies without deep massage can also relieve the pain. Nowadays, compounds identified in herbs can be used as a key to identify low-cost therapies and have fewer side effects in the treatment of many diseases [31]. Using these herbal oils is a simple, cost-effective, uncomplicated, and non-invasive way to treat the chronic pain such as LBP. The positive effect of rubbing of joint oil (chamomile oil product) and sesame oil on nurses with chronic LBP suggests that it can be used easily by everyone and without the need for any specific techniques.

Limitations of the research

Short duration for implementation of intervention (three-week intervention, two times per

day) and low sample size are our limitation so we recommend to researchers, consider these limitations in the next studies.

Conflicting Interest

The authors declare that they have no conflict of interest.

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