



Effect of Aromatherapy with Lavender on Labor Pain: A Literature Review

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Abstract

Background: Controlling labor pains is now an essential part of midwifery care, and aromatherapy is a well-known medicinal treatment for easing labor pains. The aim of this research was to evaluate and analyze the most recent clinical trial results on the effects of lavender aromatherapy on labor pain management.

Methods: Several keywords were searched in the MEDLINE/PubMed, Scopus, and Google Scholar databases, including lavender, *Lavandula*, childbirth, labor, pregnancy, labor pain, aromatherapy, and delivery. Two authors extracted the data, and the Cochran quality management tool was used to assess the consistency of each study.

Results: In general, 7 studies were reviewed after checking the titles and abstracts of the studies and eliminating obsolete or low-quality studies. Two studies were conducted in Egypt and Indonesia, and five studies were conducted in Iran. There were a wide variety of qualities in the studies, which could render more quantitative synthesis impractical. Massage aromatherapy was employed in three trials, and inhalation was applied in four studies. All findings suggested that lavender aromatherapy in both methods could reduce active phase labor pain.

Conclusion: Although the results of this study showed that lavender aromatherapy suppressed labor pain, more detailed randomized clinical trials with higher precision are needed to achieve an accurate outcome for data generalization regarding the use of labor pain management.

Keywords: Aromatherapy, Lavender, Labor Pain, Non-pharmacological, Clinical trial

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Introduction

Labor pain is one of the most extreme types of pain faced by nearly all females during labor (1) and may have negative consequences on both the mother and the fetus (2). Fear of labor pain, especially in nulliparous women, can influence mothers' choices for the next delivery process, leading to an increase in the mother's ability to have a selective cesarean section in the future (3, 4). Therefore, strategies for mitigating labor pain are critical, and both pharmacological and non-pharmacological approaches should be considered in the hopes of lowering the cesarean section rate (5, 6). Although some drugs have been shown to be helpful in mitigating labor pain, a Cochrane review study revealed that some treatments can reduce labor pain while still causing negative maternal and neonatal outcomes (7). The non-pharmacological methods of reducing labor pain are not intrusive although they are responsive and inexpensive and tend to be safe for both the mother and the fetus. However, the clinical effectiveness of these new methods has remained a source of debate due to the lack of credible data (7, 8). There are many other factors and labor methods and medications

(9-11) that might also affect the perception of pain or biochemical factors related to the mother's body (12).

According to numerous reports, non-pharmacological treatments such as water immersion, exercise classes, rehabilitation, heat and cold therapy, acupuncture, aromatherapy, massage, and music therapy have benefits such as excellent pain relief and warmth (1, 13-15).

Aromatherapy has been one of the non-pharmaceutical alternatives for easing labor pain. Aromatherapy is a term that describes a group of conventional, alternative, and complementary treatments that make use of essential oils (EOs) and other aromatic plant compounds. EOs, which have been used to enhance a person's health or disposition for over 6000 years, are plant extracts that are obtained by steaming or pressing various plant components (i.e., barks, fruits, and the leaves or flowers). Aromatherapy is characterized as a "treatment program or use of aromatic substances (EOs) for comprehensive treatment" by the National Association for Comprehensive Aromatherapy. Although aromatherapy has gained extensive interest in recent years, it still requires further investigation (13, 16). Based on preliminary studies, aromatherapy has the

potential to alter brain frequencies (17-21). It also reduces depression by increasing cortisol, the “stress hormone”, and thereby a feeling of well-being (22-25). According to some researchers, different scents have various effects on a wide variety of persons. Aromatherapy is a supplemental drug that cannot be used to cure medical problems on its own (26, 27). Various studies showed that aromatherapy can help with nausea and vomiting, body aches and pains, anxiety, confusion, stress and depression, exhaustion and insomnia, muscle aches, headaches, circulatory complications, menstrual problems, and menopausal symptoms among other things (25-29).

Lavender (*Lavandula angustifolia*), as a green mint family species, is one of the medicinal herbs that is applied in aromatherapy (30). The ketones in lavender are helpful in reducing pain and inflammation. Esters also avoid muscle spasms, relieving stress and depression (31).

Lavender aromatherapy was applied during labor and demonstrated positive effects in terms of pain relief and anxiety reduction (31-35). Based on previous evidence, those certain non-pharmacological methods (e.g., lavender aromatherapy) may improve labor outcomes although there is a need for a systematic look at the findings of published studies in this field. However, it has not been

thoroughly explained, and there is no scientific consensus about the use of lavender aromatherapy in hospitals for suppressing labor pain. In fact, a lack of the analysis of related studies is one of the most important obstacles to the widespread use of lavender aromatherapy in clinical settings. Accordingly, the current review analysis was performed aiming at reviewing and summarizing the available data from clinical trials on the benefits of lavender aromatherapy on labor pain management.

Methods

A scientific search was performed using a variety of keywords such as aromatherapy, lavender, Lavandula, gestation, conception, labor, delivery, birth, and labor pain in internal and external databases such as MEDLINE/ PubMed, Scopus, and Google Scholar. Both related papers were included regardless of the publication year. Clinical trials investigating the efficacy of lavender as an aromatherapy agent for labor pain met the inclusion criterion. Studies using the other techniques of research design or having no access to the full text were excluded from the review. In addition, studies with insufficient data were not included in the study (Figure 1).

The reference lists of the compiled papers were searched

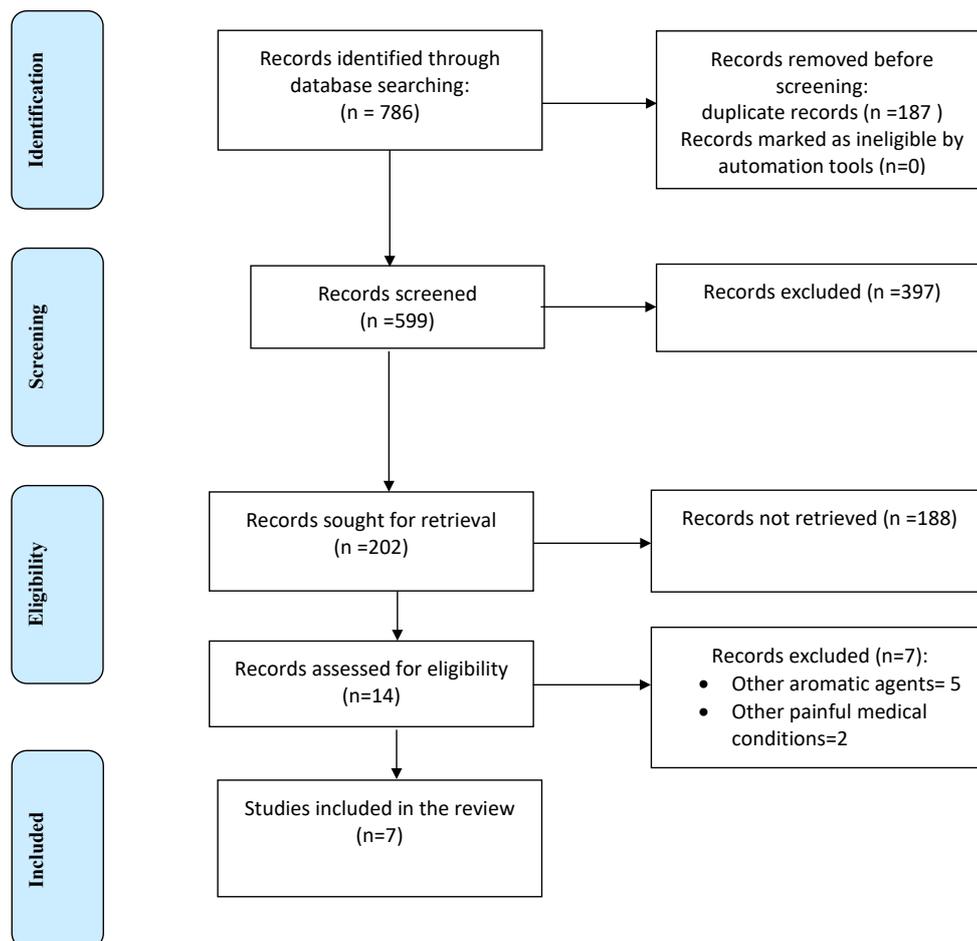


Figure 1. PRISMA Flow Chart.

to find if there were any other important records. Personal correspondence was made with the authors of the papers when requiring more information. The research included experiments where the experimental setup was a clinical trial, and lavender aromatherapy was used to relieve labor pain at each stage of labor. Labor pain was measured using a 10 cm visualized grading scale as a research endpoint.

Irrelevant documents were initially omitted based on a screening of the titles and abstracts of the papers. The full texts of the papers that seemed to be significant were then further collected and analyzed to determine if they met the inclusion criterion. A form was created to collect data such as the research ID (the first author's name and publication year), region, aromatherapy style,

outcomes, and the number of assessed pregnancies. The quality of the study was examined in terms of random allocation generation, random allocation concealing, blinding of participation and administrators, blindness in the evaluation of outcomes, incomplete outcome, selected finding presentation, and other potential biases.

Results

Seven studies were reviewed after querying the study titles and their abstracts and deleting elements that were obsolete or of poor quality. Table 1 provides the properties of qualitative synthesis research.

Two studies focused on patients who had prior pregnancy experience (23,36) while four studies by Kaviani et al (37),

Table 1. Characteristics of the Final Reviewed Studies in the Present study

First Author	Participants	Intervention	Outcome
Abbaspoor (22)	Sixty pregnant women (nulliparous and multiparous) with a singleton embryo, gestational period of >36 weeks, cephalic appearance, cervical dilatation of 4 cm or more, and three uterine contractions in 10 minutes	<ul style="list-style-type: none"> - Intervention group (n=30): massage and aromatherapy with two drops of the EO in 50 cc almond oil - Control group (n=30): - Massage therapy 	The overall labor discomfort of both groups considerably decreased after the intervention. The intervention group experienced a higher decline in discomfort compared to the control group.
Kaviani (37)	One hundred sixty primiparous women with a gestational age of 36 weeks and a cervical dilation of 3-4 cm.	<ul style="list-style-type: none"> - Intervention group (n=80): Aromatherapy vaporization using a handkerchief soaked in 0.1 mL EOs in 1 mL saline solution and connected to the collar - Control group (n=80): Handkerchief soaked in 2 mL of saline solution connected to the collar. 	The mean pain labor in the aromatherapy group decreased 30 minutes and one hour after the intervention.
Mohammadkhani (36)	Ninety Iranian multiparous pregnant women were aged 18-35 years, with a single fetus, gestational age of 37-42 weeks, cervical dilatation of 4 cm, gestation with minimal risk, and a moderate body mass index.	<ul style="list-style-type: none"> - Intervention group I (n=30): EO back massage aromatherapy - Intervention group II (n=30): back massage with almond oil - Back massage alone (n=30) in the control group 	The overall mean of the measured labor pain three times in each group showed that the pain was significantly less after the intervention in all groups compared to before the intervention. The most significant difference was related to the massage aromatherapy group with the lavender oil.
Vakilian (41)	There was no history of acute or chronic illness, no history of acute or chronic discomfort, and no allergy history in 120 multiparous women with a single fetus. †	<ul style="list-style-type: none"> - Intervention group (n=60): Cold incense guided with the lavender oil - Control group (n=51): Incense with cold water 	The overall mean of labor pain in the three measures did not vary significantly between the two groups ($P=0.27$). The difference in the mean pain between the two groups before and after the intervention was substantial ($P=0.03$).
Yazdkhasti (39)	One hundred and twenty primiparous pregnant women in a term gestation in cephalic presentation and dilatation of more than 3-4 cm of the cervix.	<ul style="list-style-type: none"> - Intervention group (n=60): Two drops of the lavender EO as inhalation aromatherapy in three stages (dilatations of 4, 6, and 8 cm) - Control group (n=59): Placebo (distilled water) 	The difference in labor pain was significant before and after the intervention in the two groups ($P=0.001$).
Lamadah (38)	Sixty primiparous pregnant subjects with term pregnancy and cephalic presentation	<ul style="list-style-type: none"> - Intervention group (n=30): Massage of the back with two drops of the EO in almond - Control group (n=30): Only massage 	The lavender group experienced considerably less labor pain throughout the active and transitional phases compared to the control group.
Karo (40)	Forty primiparous women with dilatation of 4-8 cm of cervix and uterus height of 32-38 cm above the symphysis pubis.	<ul style="list-style-type: none"> - Intervention group (n=20): Lavender oil in 10 mL packages as inhalation aromatherapy for 30 minutes - Control group (n=20): No intervention 	When compared to the control group, the intervention group had a substantial reduction in labor discomfort.

Note. EO: Essential oil.

Lamadah and Nomani (38), Yazdkhasti and Pirak (39), and Karo et al (40) only evaluated nulliparous births. One paper delved into all types of births (18). A total of 37, 33, and 5 studies were undertaken in Indonesia, Egypt, and Iran, respectively (22,36,37,39,41). Aromatherapy was used as massage aromatherapy in studies Lamadah and Nomani (38), Abbaspoor and Mohammadkhani Shahri (22), and Mohammadkhani Shahri et al (36), and inhaled aromatherapy with lavender was applied in four other studies (37,39,40). The data relating to the reviewed studies are presented in Table 1. Massage aromatherapy treatments employed two separate arms of intervention, including massage therapy solely or massage with the EO of almond. Aromatherapy interventions used cold water fumigation, electric fumigation apparatus, and water-soaked napkins as comparison interventions. The studies usually had intermediate to mixed consistency. In three trials, random assignment was found to be at a low-risk level (18,36). Table 1 provided the findings relevant to the studies. In both trials, the overall severity of labor pain was measured using a 10-cm visual grading system. In certain studies, labor pressure was measured at 4, 6, and 8 cm cervix dilatations (22,36,23). In the study by Kaviani et al (37), the labor pain was measured and registered 30 and 60 minutes after the intervention. In trials where aromatherapy was employed in combination with massage, the overall levels of labor pain were considerably lower in the intervention group compared to pre-intervention although no differentiation was detected between the experimental and control groups (22,36). In a study, lavender massage aromatherapy reduced mean labor discomfort in the productive and transitional phases of labor considerably more than the control group (38). In three experiments at varying cervical dilatation stages, the overall mean of labor pain was not statistically different in inhalation aromatherapy via masks in comparison with the controls. On the other hand, the experimental group demonstrated a lesser increase in mean pain before and after the session compared to the control group (23). In a trial by Kaviani et al, napkins soaked in EOs and tied around the waist of the patient were utilized for respiratory aromatherapy and it was found that patients receiving the intervention had less labor pressure 30 and 60 minutes after the intervention (37). Karo et al also reported that the average of labor pain was lower in the intervention group compared with the control group after 30 minutes of aromatherapy using an electric unit (40).

Discussion

Although the primary mechanism of action of lavender aromatherapy is unknown, according to an analysis of clinical trial results in our research, it can make women in labor experience less pain during labor. Based on previous research on the psychological and physiological benefits of EOs, aromatherapy controls human mood and reduces

anxiety without altering physiological circumstances (41,42). Similarly, Tabatabaeichehr and Mortazavi assessed the efficacy of aromatherapy in the treatment of labor pain (29). To the best of our knowledge, our study is the first one to focus on a single aromatic agent. Further analysis (e.g., network meta-analysis) is proposed due to the large number of aromatic agents used in different studies. There seems to be a connection between anxiety and increased labor pain during childbirth. Labor pain, followed by labor anticipation, triggers maternal anxiety during labor and increases catecholamine intake, causing pain by stimulating the autonomic and humoral nervous systems. Aromatherapy works by allowing EOs to absorb into the respiratory system, which can reduce cortisol production while increasing serotonin levels. According to Mirzaei et al (33), aromatherapy EOs relieve stress in postpartum women, reduces cortisol production from the adrenal glands, and enhances gastrointestinal serotonin production (33,43). The linalool in lavender inhibits acetylcholine release and alters the function of ion channels at the neuromuscular junction. Linalyl acetate and linalool are considered as narcotic and sedative, respectively, and are consumed by skin massage in about 5 minutes, and their plasma concentration peaks in about 20 minutes (44,45). Furthermore, some experts believe that the distraction of aromatherapy is a major factor in the reduction of labor discomfort. These techniques are used to amuse women when they are in labor in order to alleviate their discomfort (46). In cases of massage aromatherapy, it seems that the scent of lavender or the subsequent massage procedure induces less emphasis on the discomfort of childbirth. Many concerns are raised in this review study about the basic dimensions of clinical trials that address the need for further research and evaluation. In general, the clinical trial represented moderate to mixed efficiency. The remaining studies lacked sufficient knowledge about the testing methods. The subjects were not blinded in the majority of clinical trials.

Additionally, some other systematic reviews and meta-analysis studies applied different search strategies with various outcomes in comparison with our study. However, all these studies show the potential benefits of aromatherapy with lavender on labor pain relief (47-49). Makvandi et al also performed an interventional study with the same beneficial results (49).

Conclusion

Despite the difficulties described, our research findings demonstrated that using lavender aromatherapy relieves labor pain in laboring women. Aromatherapy is inexpensive and necessitates no extensive preparation. However, more randomized controlled clinical trials would be needed to arrive at a precise and comprehensive conclusion.

Conflict of Interest Disclosures

None.

Acknowledgment

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Ethical Statement

Not applicable.

Authors' Contributions

RHR designed the study. RHR conducted all literature reviews and manuscript writing.

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Informed Consent

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