ABSTRACT

Objective: The objective of this study was to review, in the national and international scientific literature, the benefits of using essential oils and aromatherapy in labor. Method: An integrative literature review (ILR) developed in the following databases: Literatura Latino-Americana e do Caribe em Ciências da Saúde, Cumulative Index to Nursing and Allied Health Literature, National Library of Medicine and Web of Science. Original scientific articles published from 2016 to 2021 in national and international journals in the Portuguese, English and Spanish languages were included. Results: The corpus of this review consisted of 14 articles. Given the findings, the benefits or EOs and aromatherapy in labor were divided into two subtopics with pain relief and reduction of maternal anxiety as highlights. Conclusions: The knowledge produced on the theme was mainly concentrated at the international level. Aromatherapy and EO use can be offered to parturients as an excellent non-pharmacological strategy for pain and anxiety relief, of low cost, non-invasive and with low risk of side effects, with the possibility of being performed by nurses.

Descriptors: Aromatherapy; Oils, Volatile; Labor, Obstetric; Pain; Anxiety.

RESUMO

**Conclusão:** o conhecimento produzido sobre a temática se concentrou principalmente no nível internacional. A aromaterapia e o uso de OE podem ser ofertados às parturientes como uma ótima estratégia não farmacológica para o alívio da dor e da ansiedade, de baixo custo, não invasiva e com baixo risco de efeitos colaterais, podendo ser efetuada por enfermeiras(os).

**Descritores:** Aromaterapia; Óleos Voláteis; Trabalho de Parto; Dor; Ansiedade.

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**RESUMEN**

**Objetivo:** El objetivo de este estudio fue revisar, en la literatura científica, nacional e internacional, los beneficios de utilizar aceites esenciales y aromaterapia en el trabajo de parto.

**Método:** Revisión Integradora (RI) de la literatura, desarrollada en las siguientes bases de datos Literature Latino-Americana e do Caribe em Ciências da Saúde, Cumulative Index to Nursing and Allied Health Literature, National Library of Medicine y Web of Science. Se incluyeron artículos científicos originales, publicados en revistas académicas nacionales e internacionales entre 2016 y 2021, en portugués, inglés y español. **Resultados:** El corpus de esta revisión integradora estuvo compuesto por 14 artículos. En vista de los hallazgos, los beneficios de la aromaterapia y de los AE en el trabajo de parto se dividieron en dos subtemas en los que se destacaron el alivio del dolor y la disminución en el nivel de ansiedad materna.

**Conclusiones:** El conocimiento producido sobre la temática se concentró principalmente en el ámbito internacional. La aromaterapia y el empleo de AE se pueden aplicar a mujeres en trabajo de parto como una excelente estrategia no farmacológica aliviar el dolor y la ansiedad, siendo de bajo costo, no invasiva y con bajo riesgo de efectos colaterales, con la posibilidad de ser aplicada por enfermeras(os).

**Descriptores:** Aromaterapia; Aceites Volátiles; Trabajo de Parto; Dolor; Ansiedad.

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According to the World Health Organization (WHO), the branches of traditional, complementary and integrative medicine refer to a broad set of health care practices based on theories and experiences from different cultures used for health promotion, prevention and recovery, taking into account the integrality of human beings and their multidimensionality. Since 2006, the National Policy of Integrative and Complementary Practices (ICPs) has been instituted in the Unified Health System (Sistema Único de Saúde, SUS). However, it was only in 2018 that aromatherapy was included in the list of ICPs through Ordinance No. 702, dated March 21st, 2018. Currently, aromatherapy with essential oil use is recognized as an Integrative and Complementary Practice (ICP) with broad individual or collective use, even with the possibility of being associated with other ICPs. It is considered as an intervention possibility that enhances the expected treatment results. Essential oils (EOs) are extracts from aromatic plants subjected to distillation processes and can be used for therapeutic purposes through the cutaneous (massage) and olfactory (aromatherapy) routes. Their energetic effects act in order to ensure complementary, preventive and curative care of a variety of human pathologies, especially if the interfaces are the olfactory sense and subcutaneous tissue.

As a multiprofessional practice, aromatherapy and EO use have been adopted by various health professionals, such as nurses, physicians and physiotherapists, among others. They are employed in the different health area sectors to complementarily assist in and establish a person's physical or emotional balance. In the Obstetrics field, these ICPs have been used in the care provided during the delivery process, mainly in pain management. Delivery is a physiological event full of intense emotions and sensations. The way in which it is experienced leaves marks both in the memory and in the body. Pain is defined as a sensory, emotional, subjective and individual experience. It can be present during delivery and be experienced in several ways, considering the subject's mental preparation, individuality and history.

Anxiety is also a factor that can affect the delivery experience. It can be related to complications during labor due to activation of the sympathetic nervous system and to the release of stress hormones. Along with the breathing technique, aromatherapy reduces the anxiolytic effects and provides tranquility and well-being to parturient women.

For being low-cost and non-invasive, aromatherapy and essential oil use have increasingly proved to be a viable option for complementary care during labor. In addition to controlling pain, EOs can also reduce nausea, vomiting, headaches and hypertension. Despite the gradual increase in the use of aromatherapy and EO in Brazilian obstetric care, most of it occurs in the absence of robust scientific evidence, as there are little few national research studies on the topic and there is a need to develop studies that elucidate its benefits and applicability. In 2019, the second author of this paper coordinated an integrative review research study, developed in the Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS),...
Cochrane Library and National Library of Medicine (PubMed) databases, which aimed at identifying, in the scientific literature, diverse information on the use of aromatherapy and essential oils in labor management; as well as to elaborate a hospital protocol, based on the findings in the publications, on aromatherapy and the application of essential oils during labor. In it, it was concluded that there was predominance of international studies, reinforcing the idea of scarcity of Brazilian ones. In addition to that, the research suggested conducting other scientific research studies about theme, as well as an increase in the number of databases to be consulted.

This paper continues the aforementioned research, expanding the number of collection sources and the time frame, following with the synthesis of knowledge about the use of essential oils and aromatherapy during labor, which may guide nurses who plan to apply these practices in the parturition process assistance, with therapeutic purposes and in a safe way.

Given the above, the objective of this study was to review, in the national and international scientific literature, the benefits of using essential oils and aromatherapy in labor.

**METHOD**

**Type of study**

This was an integrative literature review (ILR), a type of study that, according to Cooper, intends to gather results of primary research studies with the same topic, aiming at data synthesis and analysis, in order to provide a comprehensive explanation on a specific theme.

**Stages of the integrative review**

The Cooper method consists of 5 stages, namely: 1- Formulation of the problem; 2- Data collection; 3- Data evaluation; 4- Data analysis and interpretation; and 5- Synthesis and presentation of the results. All these phases were strictly followed in this study.

Definition of the research problem was based on the PCC (Population, Concept and Context) mnemonic rule. In this ILR, the Population (P) was defined as "parturient women"; the Concept (C) chosen was "benefits of essential oils and aromatherapy"; and the Context (C) corresponded to "labor". Thus, the following research question was obtained: Which is the scientific knowledge production about the benefits of using essential oils and aromatherapy for parturient women during labor?

The following databases were used to perform the searches: Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS), Cumulative Index to Nursing and Allied Health Literature (CINAHL), National Library of Medicine (PubMed) and Web of Science.

This review included original scientific articles, published in national and international journals from 2016 to 2021 (focusing on the most current publications) and in Portuguese, English and Spanish, which answered the guiding question of this paper.

The materials excluded corresponded to theses, dissertations, monographies, books, articles published in journals or magazines, manuals, editorials and other productions that represented the Gray Literature. The descriptors in Portuguese, Spanish and English applied in the survey, defined from the Health Sciences Descriptors (Descritores em Ciências da Saúde, DECS) and the Medical Subject Headings (MESH) were as follows: trabalho de parto,
parto, dor do parto, aromaterapia and óleos voláteis; trabajo de parto, parto, dolor de parto, aromaterapia and aceites volátiles; labor, obstetric, parturition, labor pain, aromatherapy and oils, volatile.

The data were collected in August 2021. The crossings were made by using the AND and OR Boolean operators, as follows: trabalho de parto AND aromaterapia OR óleos voláteis; parto AND aromaterapia OR óleos voláteis; dor do parto AND aromaterapia OR óleos voláteis; trabalho de parto AND aromaterapia OR aceites volátiles; parto AND aromaterapia OR aceites volátiles; dolor de parto AND aromaterapia OR aceites volátiles; labor, obstetric AND aromatherapy OR oils, volatile; parturition AND aromatherapy OR oils, volatile; labor pain AND aromatherapy OR oils, volatile.

The studies surveyed had their titles read and, after a first selection process, their abstracts were also read. Those that met the inclusion criteria and answered the research question were read in full. Duplicate studies were excluded. The flowchart corresponding to the materials surveyed is presented below (Figure 1):

![Flowchart](image)

Figure 1. Flowchart corresponding to selection of the articles surveyed in the databases.
Source: The authors, 2021.

Inclusion of the productions surveyed was performed individually by one the authors and subsequently verified by the second author of this paper.

We organized the findings in an Excel® spreadsheet with the following data: identification number of the study; year of publication; title; author(s); indexing database; journal where it was published; country of origin; type of study; methodological approach; population; essential oils or aromatherapy method applied; collection/study locus; analysis strategy; main results and conclusions.

The results arising from data extraction were arranged in charts, discussed by means of a descriptive synthesis, and presented in a narrative way.

**Ethical aspects**

This study met the research regulating norms and Copyright Law No. 9,610 dated February 19th, 1998. All the data were duly referenced and we respected the intellectual
property of the scientific texts surveyed observing ethical rigor, regarding use of the content and citations of the papers.

The current study was registered and approved in the Research Commission of the Nursing School at the Federal University of Rio Grande do Sul, under registration No. 40,847.

RESULTS

Initially, 162 articles were found in the databases researched, within the time frame established (from 2016 to 2021). A total of 143 manuscripts were duplicates and five were excluded for not meeting the other inclusion criteria defined. After the floating reading of the material, the corpus was assembled with 14 articles, which were coded with the letter "A", followed by the numeral identification of the selection sequence (A1, A2, A3... A14). Chart 1 shows all the information referring to the studies selected:


<table>
<thead>
<tr>
<th>Code</th>
<th>Year</th>
<th>Title</th>
<th>Country of origin/ Language</th>
<th>Objective</th>
<th>Database</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>2018</td>
<td>Efficacy of aromatherapy for reducing pain during labor: a randomized controlled trial.</td>
<td>Thailand/English</td>
<td>To determine the efficacy of diffusion aromatherapy in pain relief during delivery.</td>
<td>Web of Science</td>
</tr>
<tr>
<td>A2</td>
<td>2019</td>
<td>Aromatherapy for pain relief during labor.</td>
<td>Brazil/Portuguese</td>
<td>To analyze aromatherapy use in pain relief during labor.</td>
<td>LILACS</td>
</tr>
<tr>
<td>A3</td>
<td>2019</td>
<td>Labour pain control by aromatherapy: a meta-analysis of randomized controlled trials.</td>
<td>China/English</td>
<td>To perform a meta-analysis of randomized controlled trials on the efficacy of aromatherapy on labor pain and reduction of its duration.</td>
<td>Web of Science</td>
</tr>
<tr>
<td>A4</td>
<td>2020</td>
<td>The effectiveness of aromatherapy in the management of labor pain and anxiety: a systematic review.</td>
<td>Iran/English</td>
<td>To systematically review all the evidence currently available by evaluating aromatherapy use for the treatment of pain and anxiety during delivery.</td>
<td>Web of Science</td>
</tr>
<tr>
<td>A5</td>
<td>2018</td>
<td>The effects of inhalation aromatherapy with Boswellia carterii essential oil on the intensity of labor pain among nulliparous women.</td>
<td>Iran/English</td>
<td>To evaluate the effects of inhalation aromatherapy with Boswellia carterii essential oil.</td>
<td>Web of Science</td>
</tr>
<tr>
<td>A6</td>
<td>2018</td>
<td>Effects of aromatherapy with rosa damascena on nulliparous women's pain and anxiety of labor during first stage of labor.</td>
<td>Iran/English</td>
<td>To evaluate the effects of aromatherapy with rosa damascena on pain and anxiety during the first phase of labor in nulliparous women.</td>
<td>PubMed</td>
</tr>
<tr>
<td>A7</td>
<td>2016</td>
<td>The effect of aromatherapy with lavender essence on severity of labor pain and duration of labor in primiparous women.</td>
<td>Iran/English</td>
<td>To investigate the effect of inhaling lavender essence in the severity of pain during delivery and on labor duration.</td>
<td>PubMed</td>
</tr>
<tr>
<td>A8</td>
<td>2018</td>
<td>Controlled breathing with or without lavender aromatherapy for labor pain at the first stage: a randomized clinical trial.</td>
<td>Iran/English</td>
<td>To examine the effect of the breathing technique with lavender on pain during delivery when compared to the breathing technique alone.</td>
<td>Web of Science</td>
</tr>
<tr>
<td>A9</td>
<td>2019</td>
<td>Comparison of the effect of Entonox gas and aromatherapy with lavender on the severity of labor pain.</td>
<td>Iran/English</td>
<td>To compare the effects of Entonox gas and lavender aromatherapy on pain severity during delivery.</td>
<td>CINAHL</td>
</tr>
<tr>
<td>A10</td>
<td>2018</td>
<td>Comparing the effect of aromatherapy with essential oils of rosa damascena and lavender alone and in</td>
<td>Iran/English</td>
<td>To compare the effects of aromatherapy with essential rosa damascena and lavender oils on pain</td>
<td>PubMed</td>
</tr>
<tr>
<td>Source Code</td>
<td>Year</td>
<td>Title</td>
<td>Country</td>
<td>Language</td>
<td>Summary</td>
</tr>
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<td>--------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>A11</td>
<td>2020</td>
<td>The effect of lavender (Lavandula stoechas L.) on reducing labor pain: a systematic review and meta-analysis.</td>
<td>Iran</td>
<td>English</td>
<td>To determine the effect of lavender on pain during delivery in Iran, by means of a meta-analysis.</td>
</tr>
<tr>
<td>A12</td>
<td>2018</td>
<td>The effect of chamomile odor on contractions of the first stage of delivery in primipara women: a clinical trial.</td>
<td>Iran</td>
<td>English</td>
<td>To examine the effects of chamomile scent on the contractions in the first delivery stage in primipara women.</td>
</tr>
<tr>
<td>A13</td>
<td>2019</td>
<td>O uso de óleos essenciais no trabalho de parto e parto: revisão de escopo.</td>
<td>Brazil</td>
<td>Portuguese</td>
<td>To describe the state-of-the-art regarding knowledge about the use of essential oils during labor and delivery.</td>
</tr>
<tr>
<td>A14</td>
<td>2019</td>
<td>A systematic review on the anxiolytic effect of aromatherapy during the first stage of labor.</td>
<td>Iran</td>
<td>English</td>
<td>To summarize the intervention studies and clinical trials that evaluated the effect of aromatherapy on women's anxiety during the first phase of labor.</td>
</tr>
</tbody>
</table>

Source for the chart: The authors, 2021.
Chart 2 presents the synthesis of the selected articles, presenting the following: type of study, population and scenario, essential oils used and application methods, main results and the authors' conclusions:

Chart 2. Synthesis of the studies surveyed in the databases, including type of study, population and locus, the essential oils and application methods used, main results and conclusions. Porto Alegre (RS), Brazil, 2021.

<table>
<thead>
<tr>
<th>Code</th>
<th>Type of study</th>
<th>Population</th>
<th>Essential oils and application methods</th>
<th>Main results</th>
<th>Main conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Randomized clinical trial</td>
<td>- Primigravidae; - Gestational age between 37 and 41 weeks; - Cephalic fetus; - Hospital.</td>
<td>- EOs: lavender; geranium; tangerine; and jasmine; - Application according to each parturient woman’s choice; - Inhalation using a scent diffuser + 300 ml of water.</td>
<td>- 52 women in the Control Group and another 52 in the Experimental Aromatherapy Group; - The pain scores in the latent and active phase were lower in the group in which aromatherapy was applied; - There were no significant differences between delivery method and labor duration between both groups; - The cesarean section and vaginal delivery rates were not significantly different; - There was no significant difference in the number of cases of Meperidine use.</td>
<td>- Offering aromatherapy to parturient women can be an effective option for pain relief, simple to apply, low-cost, not aggressive and aiding relaxation.</td>
</tr>
<tr>
<td>A2</td>
<td>Integrative review</td>
<td>- Literature.</td>
<td>- EOs: lavender; ginger; bushy matgrass; sage; and olibanum.</td>
<td>- Pain perception was lower among nulliparous women than in multiparous ones; - During 5-10 cm dilation, the multiparous women who made use of the lavender essential oil reported a reduction in pain intensity.</td>
<td>- Using non-pharmacological strategies such as aromatherapy is of utmost importance to relieve pain, anxiety and stress. - Aromatherapy implementation by Nursing is a field yet to be explored. - It is still necessary to expand the number of studies and to disseminate the benefits of aromatherapy.</td>
</tr>
<tr>
<td>A3</td>
<td>Meta-analysis</td>
<td>- Randomized clinical trials; - Hospital.</td>
<td>- EOs: Roman chamomile; sage; olibanum; lavender; tangerine; and geranium.</td>
<td>- A significant reduction in pain level with aromatherapy, when compared to the controlled group; - The analysis showed that, with aromatherapy, there was a reduction in duration of the active phase and in the first stage of delivery; - Pain decreased during the 8-10 cm dilation transition phase; - There was no significant difference in the incidence of cesarean sections.</td>
<td>- Aromatherapy is effective in reducing pain and delivery duration, being safe for women.</td>
</tr>
<tr>
<td>A4</td>
<td>Integrative Review</td>
<td>- Literature.</td>
<td>- EO: lavender; rose; geranium; chamomile; jasmine; peppermint; sweet orange; bitter orange; mandarin orange; olibanum; and clove.</td>
<td>- Inhalation; - Massages; - Foot bath.</td>
<td>- Lavanda spp. is one of the most used plants in aromatherapy. Its use reduces pain intensity and labor duration; - Application of the lavender essential oil drastically reduces the anxiety level during the first phase of labor; - The <em>rosa damascena</em> oil reduces the pain levels in the 8-10 cm transition phase; - Massages with jasmine oil are more effective than inhalation; - Geranium, peppermint and chamomile essential oils proved to have an anxiolytic effect on labor; - Bitter orange reduces anxiety and pain during labor; - The <em>olibanum</em> EO exerts a positive effect on reducing pain during 8-10 cm dilation; - The mandarin orange EO exerts an anxiolytic effect in combination with other oils, namely: sage and chamomile.</td>
</tr>
</tbody>
</table>

| A5 | Randomized clinical trial | - Nulliparous women; - Cephalic fetus; - Hospital. | - Gauze soaked with 0.2 ml of *olibanum* essential oil; - 0.2 ml of *olibanum* essential oil diluted in 2 ml of saline solution, fixed on the collar of each woman; - 0.2 ml of saline solution (placebo); - The intervention was repeated every 30 minutes. | - When compared to the Control Group, the women who made use of aromatherapy revealed that pain intensity was lower; - There were no significant differences in relation to the Apgar scores at 1-5 minutes of life; - Study limitation: impossibility to blind the participants. | - Inhalation aromatherapy with *Boswellia carteri* oil exerts positive effects on pain during delivery. - Aromatherapy is a safe technique and, for this reason, it can be used in the first phase of labor. |

| A6 | Randomized clinical trial | - Nulliparous women; - Hospital. | - Two drops of lavender essential oil diluted in 10 ml of distilled water. With a dropper, it was placed in the palms of the women's hands. | - Lower pain intensity scores were observed in the parturient women who made use of lavender essential oil; - There were no significant differences in the Apgar mean score; - There were no significant differences in duration of the first and second stages of labor between the control and experimental groups. | - Aromatherapy with lavender essential oil is a simple, economical, non-invasive and effective intervention to reduce pain during delivery. |

| A7 | Randomized clinical trial | - Nulliparous women; - Hospital. | - Lavender essential oil at 1.5% concentration, without mixing it along with the lavender essential oil, the breathing technique reduced pain at | - Aromatherapy with lavender essential oil is a simple, economical, non-invasive and effective intervention to reduce pain during delivery. | - The study indicated that the lavender essential oil reduces pain at |
with water, was applied in the breathing technique group. - The women from the control group inhaled sterilized water. 

The women from the control group inhaled sterilized water.

- One group inhaled Entonox gas during the contractions; - The other group inhaled the lavender essence with sterilized gas.

- The group that inhaled the lavender essential oil in all stages of delivery presented significantly lower pain intensity.
- The Entonox gas also reduced pain intensity in all the stages of delivery.

- The study showed that both the lavender essential oil and the Entonox gas can reduce pain intensity during labor. However, the effect of the Entonox gas was higher than the one produced by lavender.
- The maternal complications with lavender use were lower than with the Entonox gas.

A9 Double-blind randomized trial

- Nulliparous women; - Hospital.

- The participants were divided into four groups: the first inhaled 0.1 ml of rosa damascena essential oil with 2 ml of distilled water; the second inhaled 0.1 ml of lavender essential oil with 2 ml of distilled water; the third inhaled 0.1 ml of rose essential oil plus 0.1 ml of lavender mixed with 2 ml of distilled water; and the fourth inhaled 2 ml of distilled water.

- In all three groups that made use of the rosa damascena and lavender oils, as well as of both mixed, there was a significant reduction in pain intensity 30-60 minutes after the intervention;
- Lavender was more effective when used alone than when combined.

- Either combined or used alone, the rosa damascena and lavender oils can reduce pain during delivery. Therefore, this safe and low-cost intervention method is recommended to mitigate maternal pain, in order to avoid using chemical analgesics and, probably, to reduce the rate of cesarean sections.

A10 Randomized clinical trial

- Multiparous women; - Cephalic fetal presentation; - 37-41 gestational weeks; - Hospital.

- Lavender essential oil applied through inhalation or massage.

- The study also showed a significant difference in the mean pain scores during delivery between the intervention and control groups.

- The participants' high level of satisfaction with aromatherapy showed a reduction in the pain intensity score with lavender essential oil inhalation.
- It is essential to reduce the unnecessary costs related to cesarean sections and analgesics and to provide non-pharmacological analgesia methods to parturient women.

A11 Meta-analysis

- Nulliparous women; - Hospital.

- Chamomile essential oil applied through inhalation.

- During 5-7 cm dilation, intensity of the contractions in the group that inhaled chamomile was lower than in the Control Group;
- The number of contractions was the same

- The study using chamomile essential oil reduced intensity of the contractions at 5-7 cm dilation. - The women that underwent the intervention
In this integrative review, more randomized clinical trials were identified, which are used as a reference standard in experimental research studies and make it possible to determine the efficacy of an intervention, such as application of EOs and aromatherapy. It is believed that such characteristic has contributed to the prevalence of studies of this nature.

Most of the research studies (8) had nulliparous women as population and pointed out the reduction in the experienced pain threshold as a benefit of using EOs and aromatherapy during labor. Anxiety relief and higher levels of maternal satisfaction in relation to the delivery experience were also observed.

### DISCUSSION

In view of the results presented, the benefits of aromatherapy and EOs on labor were divided into two sub-themes in which pain relief and decreased maternal anxiety stood out.

**Aromatherapy as a strategy for pain relief during labor**

In the Brazilian context of delivery care, there is the possibility of offering non-pharmacological strategies for pain relief and comfort promotion. Pain relief is one of the main factors for a good progression of labor, as both the physiological and psychological responses to pain can affect maternal and fetal well-being and progression of the parturition process.

Fear of labor pain can result in complications during labor and in the parturient (or the family) making rush decisions, the most common being cesarean surgery without any actual...
indication, which increases the chance of uterine and urinary tract infections, thromboembolism and even maternal deaths. This emotion can be mitigated by providing a positive delivery experience through the application of health education and humanized care strategies based on scientific evidence.

We believe that the use of non-pharmacological strategies such as the application of EOs and aromatherapy can provide maternal satisfaction and positive delivery experiences. Preparation of the women (family or couple) to try essential oils and aromatherapy during the parturition process can be initiated during prenatal care through health education, involving an investigation of the pregnant woman's olfactory identity and sharing knowledge about EOs and their use through inhalation, all based on science.

Aromatherapy is a non-invasive, low-cost and easy-to-implement intervention that can be applied by nurses in labor and delivery assistance. Its mechanism of action is triggered from the moment in which the EO molecules enter through the nostrils and their substances are carried by a set of nervous cells to the limbic system, which is associated with emotions, memory and behavioral patterns. This direct interaction with the nervous system and the brain confers EOs much of their therapeutic power, especially in the emotional manifestations linked to the limbic system.

We argue that labor mobilizes multiple emotions in women and that is not limited to uterine contractions, to fetal movements to adapt to the pelvis, or to cervical dilation. It especially happens in the maternal brain through the mobilization of its structures, including the limbic system and, consequently, the production and release of hormones, which will generate physiological, emotional and behavioral responses. Given this and knowing the mechanism of action of the EOs, we infer that aromatherapy represents an excellent complementary strategy for comprehensively managing the parturition process.

The studies analyzed were mostly international publications and came predominantly from the Asian continent. This is due to the fact that Asia has a proven history with the therapy studied in this research. More than 3,500 years ago, a phytotherapy treatise emerged in China, considered the oldest and containing compositions of aromatic oil preparations for massage. Asian countries have an age-old tradition in the use of medicinal plants and their derivatives for health care. This finding reinforces the history of this region in investing in the production of knowledge about the use of EOs and their application in health.

In the obstetric scenario in Iran, the delivery care team can be comprised both by obstetricians and by midwives. Both professionals commonly use alternative and complementary medicine in the assistance provided, with aromatherapy and massage as strategies adopted mainly by midwives, due to previous positive experiences and the tradition of Iranian medicine.

In Brazil, the obstetric model is mostly technochratic, which values use of high technology. An indicator that elucidates this aspect is the country's cesarean section rate, which is already 57.2%. One of the actions that can contribute to changing this panorama is incorporating obstetric nurses in Obstetrics services, and Rede Cegonha was one of the public policies that enabled integration of these professionals in delivery care and, more horizontality, in the assistance provided.
At the national level, not many studies were identified that show the application of EOs and aromatherapy in the parturition process. In Rio Grande do Sul (RS), where the authors of this research live, a scientific paper evidenced that, in a maternity hospital that joined *Rede Cegonha*, lavender and jasmine EOs and aromatherapy began to be implemented in the care for pain relief during delivery\(^1\).

In Porto Alegre, there is a maternity hospital that implements a protocol for the use of EOs and aromatherapy during labor, elaborated from the study that preceded this integrative review\(^\text{9}\).

Theoretical knowledge about aromatherapy is fundamental for safe application in parturients. A research study on the use of aromatherapy during labor and nurses’ knowledge was conducted, showing that 100% of the participants had some knowledge about aromatherapy. However, only 69.2% had theoretical knowledge about this practice\(^\text{22}\).

Application of EOs and aromatherapy in labor and delivery care is not exempt from risks. As already mentioned, EOs act on the limbic system and elicit physiological, emotional and behavioral responses. Therefore, nurses who wish to adopt these ICPs in care need to know the EOs, their mechanism of action, their effects and the risks and benefits they can generate.

The cinnamon EO, for example, is very potent and has chemicals that can cause irritation to the skin and mucous membranes. Another oil empirically applied is rosemary, which has high camphor content and, if used during pregnancy, can cause miscarriages\(^5\).

Therefore, it is necessary to pay attention to the application technique for EOs and aromatherapy, as well as which EOs to use in the assistance provided to women during the pregnancy-puerperium cycle. Deliberate use not based on scientific research studies can cause harms.

In the scientific research studies, the lavender EO was the most used for pain relief during labor\(^23\). *Lavender angustifolia* has therapeutic, analgesic, anti-inflammatory and hypotensive properties\(^5\). Due to these characteristics, the perception and intensity of the pain level during the latent phase of labor decreases. A study combined the lavender EO with the breathing technique and showed that there was a significant reduction in the pain level\(^24\). Aromatherapy can be associated with other non-pharmacological strategies for pain reduction.

When compared to Entonox gas, which is a mixture of nitrous oxide and oxygen, inhalation of lavender EO is an option for pain relief during the parturition process\(^25\). The lavender EO reduces pain intensity at all stages of labor and causes fewer side effects (nausea and fainting) than Entonox gas\(^25\).

The olibanum EO stood out in studies with anti-inflammatory and sedative action\(^26\). It comes from the resin of a tree that grows in the Africa (Somalia and Ethiopia) and Arabian (Oman, Yemen)\(^5\) regions. Olibanum EO inhalation significantly reduced pain during the active phase of labor\(^26\).

In one study, reduction in the pain intensity level was promoted through the inhalation of *rosa damascena* EO after 30-60 minutes in the first phase of the parturition process\(^27\). Another paper concluded that the *rosa damascena* EO is also effective in relieving pain during cervical dilation between 8 and 10 cm\(^28\).
The Roman chamomile EO is a powerful analgesic. Due to this characteristic, in a research study it was verified that, during 5-7 cm dilation, it reduced intensity of the contractions, increasing the parturients’ level of satisfaction.

Another two EOs studied in scientific research that also showed a reduction in the pain level were geranium and clarified sage. The geranium EO significantly reduced pain intensity in the latent and active phases of labor. It has anti-inflammatory, analgesic and anti-hemorrhagic properties.

The clarified sage EO showed analgesic effects in the active phase of the parturition process. However, it should be used in low dosages, as it has emenagogue and uterine tonic properties, accelerating progression of labor.

As already mentioned, EOs can be applied through inhalation or via the dermal route. When an essential oil is used via the cutaneous route, it crosses the skin barrier through the hair follicles, as well as through the sebaceous and sweat glands, as the molecules are small and low-weight. Once absorbed, it falls into the bloodstream, which transports it to other body tissues and organs.

The application method that prevailed in the studies surveyed was inhalation. Part of the paper addressed direct inhalation of the EO and others used a soaked gauze, a diffuser collar or diluted with water by an environment diffuser.

When we inhale, our olfactory receptor cells receive the smell, which advances straight to the limbic system, comprised by the amygdala, thalamus, hypothalamus, hippocampus and pineal gland. These structures are associated with emotions, pleasure, pain and memory (both long- and short-term). Therefore, some specific smells can produce an emotional response and allow reliving a memory.

Depending on the type of aroma, nerve cells release different neurotransmitters, such as endorphins, serotonin and norepinephrine. These neurotransmitters can relieve pain. In addition to that, aromatherapy decreases the corticotrophin-releasing hormone by affecting the olfactory pathways in the hypothalamus and, thus, it alleviates anxiety.

Aromatherapy as a strategy to reduce anxiety during labor

Anxiety is an emotional state that encompasses both physiological and psychological components that comprise the set of the different human experiences. The term “anxiety” encompasses the feeling of apprehension and alteration in the states of wakefulness or alertness.

It is common for the anxiety level during labor to increase significantly in nulliparous women, as they are afraid of the unknown and have never experienced the parturition process.

Maternal anxiety interferes with progression of delivery, as it stimulates the sympathetic nervous system to release stress-related hormones, such as norepinephrine, cortisol and adrenaline, which can lead to a reduction in effective uterine contractions and prolonged first and second stages of labor, increases the risk of invasive interventions and even increases the probability of a cesarean section.

Anxiety generates a severe contraction of the pelvic floor and can enhance the physical perception of pain. When pain becomes uncontrollable, human coping skills decrease and anxiety increases. Anxiety intensification during labor causes the release of catecholamines.
blocking oxytocin secretion in the anterior pituitary, a hormone that is responsible for stimulating uterine contractions and, in addition to that, for creating and strengthening the mother-infant bond.

In relation to anxiety reduction, lavender was a quite present EO, showing more efficacy in reducing the anxiety levels during the latent and active phases of labor. *Lavanda angustiholia* has linalool and linalin acetate in its biochemical composition, which stimulate the parasympathetic system, causing relaxation, balance and calm. Considering such properties, this EO can generate many benefits in the parturition process, which can often be experienced with fear, tension and pain.

We emphasize that when this EO is used in high concentrations, it exerts the opposite effect, stimulating wakefulness.

A study evaluated parturients’ anxiety level through the Spielberger Anxiety Questionnaire before and after inhaling *rosa damascena* EO. The evaluation took place in two stages of the labor dilation period (4-7 cm and 8-10 cm) and showed that there was a reduction in the anxiety level after inhaling *rosa damascena* EO in both stages.

The geranium EO has anti-inflammatory, antidepressant and sedative properties, showing its efficacy in reducing the anxiety level in the first phase of labor.

The olibanum EO also exerted effects of anxiety relief in the first phase of labor. Other essential oils that also triggered anxiolytic effect were sweet orange, bitter orange and tangerine. All have sedative and relaxing properties and promote reduction of stress, which is an enemy of the physiological parturition process.

Unlike other citrus oils, the mandarin orange EO proved to be less effective in reducing anxiety when used alone; therefore, it is recommended that it be used in combination with one of the following oils: lavender, olibanum, Roman chamomile and sage.

The jasmine EO showed more effects on anxiety management when applied through massage than when inhaled.

Regarding the financial aspect, Brazil has a prominent role in the production of EOs, alongside India, China and Indonesia. The most produced EOs in the national sphere are sweet orange, bitter orange, tangerine, mandarin orange and lemon citrus, with greater availability and more accessible values. In turn, the EOs that are imported from other countries, such as olibanum, jasmine and *rosa damascena*, may have higher prices, as their raw material is difficult to access.

In Brazil, there is no national guideline instructing the use of EOs and the practice of aromatherapy by professionals who provide labor and delivery care. The Ministry of Health recommends the adoption of non-invasive practices and points out that aromatherapy should not be prevented when a woman chooses it, as it has no side effects described. However, it is important to consider that these practices should not be applied without criteria, as EOs exert systemic effects on the mother’s body.

No study involved Brazilian protocols in the databases studied. We are concerned with the deliberate application and without any theoretical and technical basis of EOs and aromatherapy during labor, which may exert a negative impact on the delivery experience. Cruz asserts that nurses are implementing aromatherapy during labor without adequate
technical knowledge, only based on other previous positive experiences, which can cause several harmful effects to parturients.

**CONCLUSION**

The main benefits of aromatherapy and the use of essential oils during labor identified in the scientific literature were pain intensity relief and decreased anxiety. Some studies have pointed to women's higher satisfaction levels and to a positive delivery experience when aromatherapy is experienced.

The knowledge produced on the theme surveyed in the databases defined in this paper was mainly concentrated at the international level, specifically in Iran.

Based on the findings, we believe that there is a gap in knowledge about the use of EOs and aromatherapy during labor at the national level, as only two studies were found: an integrative review and a scoping one, respectively.

This research had as a limitation the fact that data collection was developed in only four databases. We consider necessary to expand the search to other sources to elucidate more evidence on the topic addressed and verify the Brazilian scenario.

Based on the scientific literature, we conclude that aromatherapy and/or EO use can be offered to parturients as an excellent non-pharmacological strategy for pain and anxiety relief, of low cost, non-invasive and with low risk of side effects, with the possibility of being performed by nurses.

More research studies on the topic need to be carried out at the national level, so that there is evidence on the use of this practice with Brazilian parturients and also professionals, in addition to developing guidelines that may instruct the in-hospital practice or planned home deliveries.

**CONCLUSIONS**

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**CONFLICT OF INTERESTS**
## REFERENCES


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