THE ROLE OF AROMATHERAPY IN PAIN MANAGEMENT DURING THE FIRST STAGE OF LABOR: A LITERATURE REVIEW

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Abstract
Pain thresholds vary among mothers during childbirth, leading to differences in their pain experiences. The intensity of labor pain can increase if the mother experiences excessive anxiety and fear. One effective non-pharmacological approach to reducing pain intensity is the use of aromatherapy. Objective: This study aims to gather information on the effectiveness of pain management during the first stage of labor using aromatherapy. Methods: The study follows a systematic review of literature, evaluating non-pharmacological pain management methods during labor. Results: Complementary therapies, such as aromatherapy, have been shown to help reduce labor pain intensity. Commonly used aromatherapy oils in this context include lavender, rose, and bitter orange. Conclusion: Understanding techniques to reduce labor pain is crucial for expectant mothers, as it helps to alleviate anxiety and fear associated with the childbirth process.

Keywords: Pain, Childbirth, Midwifery Care, Aromatherapy, Laboring Mothers

INTRODUCTION

Various factors influence labor pain, including obstetric factors like maternal parity, which play a crucial role in determining the intensity of pain experienced during childbirth. Additionally, individual characteristics, environmental factors, social support, and cultural values also contribute to the pain experience (Jones et al., 2021). Different pain thresholds among laboring women result in varying intensities of pain. Excessive anxiety and fear during labor can exacerbate pain intensity due to increased catecholamine production, which heightens nerve stimulation from the pelvis to the brain due to reduced blood flow and increased muscle tension (Smith & Brown, 2022).

Generally, three primary factors affecting labor pain are anxiety, fear, and stress. Prolonged labor can increase anxiety and fear in the mother, leading to a reduction in oxytocin activity. Moreover, complications during labor and excessive medical interventions can worsen the mother's emotional state, further increasing her anxiety levels (Martinez et al., 2022; Brown & Taylor, 2023).

Pain management during labor encompasses both pharmacological and non-pharmacological approaches, with ongoing innovations in maternal care. The main goal of innovations in non-pharmacological pain management is to enhance comfort during labor by reducing maternal anxiety and fear. When anxiety and fear are reduced, labor hormones can function optimally, thereby improving comfort, reducing pain intensity, and increasing maternal satisfaction with childbirth services (Garcia et al., 2021; Lee & Kim, 2022).

LITERATURE REVIEW

The research methods used in this literature review encompass various aspects necessary for evaluating and synthesizing findings from previously published studies. This review aims to provide a comprehensive overview of the topic being studied, specifically

the management of labor pain using aromatherapy. The methods employed in this literature review include the approach, scope or subject, operational definitions of variables, data sources or locations, study population, primary materials and tools, data collection techniques, and data analysis methods.

The approach used in this literature review is an integrated qualitative and quantitative (mixed-methods) approach. This methodology allows the researcher to analyze descriptive data from qualitative studies and combine these results with quantitative findings, offering a broader perspective on the effectiveness of aromatherapy in managing labor pain.

The scope of this literature review is confined to studies focusing on the use of aromatherapy in labor pain management, particularly during the first stage (stage I) of labor. The subject of the research consists of scientific articles published between 2022 and 2024, which explore various types of aromatherapy, such as lavender, rose, and bitter orange.

The primary focus of this literature review is to assess the effects of aromatherapy on pain intensity and anxiety levels during labor. The variables examined include the types of aromatherapy used, methods of administration (e.g., inhalation, topical), and the outcomes measured (e.g., pain intensity using the Visual Analog Scale, anxiety levels using standard questionnaires).

The data sources for this review are articles retrieved from various academic databases, including PubMed, ScienceDirect, Wiley Online Library, and Google Scholar. Article selection was based on inclusion criteria that focused on experimental and quasi-experimental studies using aromatherapy as the primary intervention for managing labor pain.

The population reviewed in these studies consists of pregnant women in labor, specifically during the active phase of stage I. The selected studies involve populations from diverse cultural and demographic backgrounds, aiming to provide a broader understanding of the effects of aromatherapy.

The primary materials used in these studies are essential oils from various plant types, such as lavender, rose, and bitter orange. The main tools for measuring outcomes in these studies include pain intensity measurement tools, such as the Visual Analog Scale (VAS), and anxiety assessment tools, such as the Beck Anxiety Inventory (BAI).

Data collection was carried out through a systematic search for relevant articles from the aforementioned databases. Articles meeting the inclusion criteria were then analyzed to extract data, including information on research methodology, study population, interventions, outcomes, and key findings.

Data analysis in this literature review involves narrative synthesis and, where applicable, meta-analysis. Narrative synthesis is used to describe qualitative findings from various studies, while meta-analysis is employed to combine quantitative results from studies with similar designs and variables. The results of this analysis are presented in tables and graphs to aid in the visualization of findings.

RESEARCH METHODS

In the context of the literature review research on "Labor Pain Management in the First Stage with Aromatherapy," the research methods include the approach, scope or

subject, operational definitions of variables, location, population and sample, primary materials and tools, data collection techniques, and data analysis techniques.

The approach used in this research is a systematic literature review. This approach aims to analyze and synthesize the results of previous studies relevant to the topic of labor pain management using aromatherapy. It enables the researcher to identify patterns, trends, and gaps in the existing research.

The subject of this literature review consists of scientific articles discussing the use of aromatherapy as a non-pharmacological intervention for managing labor pain during the first stage (stage I). This review includes studies published within a specific timeframe (e.g., 2022-2024) and written in English.

Labor Pain: Defined as the pain sensation experienced by the mother during the first stage of labor, often measured using subjective scales such as the Visual Analog Scale (VAS).

Aromatherapy: Defined as the use of specific essential oils, such as lavender or rose, applied to reduce labor pain intensity through inhalation or topical application.

Effectiveness: Defined as the reduction in pain intensity measured after the application of aromatherapy, based on the results reported in the reviewed studies.

Since this is a literature review, the research location does not refer to a physical place but to the electronic databases used to search for articles, such as PubMed, Scopus, JSTOR, Wiley Online Library, and other academic databases. This research uses a literature review method with a descriptive approach. The researcher conducted a search found 1.994 journals, both domestic and international, using the keywords 'complementary and labor pain' in both Indonesian and English. The journal titles were then filtered based on the publication year, specifically from 2022 to 2024. Furthermore, the titles were screened again to assess their relevance to the research and to meet the criteria set by the researcher, such as excluding review articles and ensuring full access. From this process, 10 journals were found to be relevant to the research to the research title

Population: Research articles available in academic databases related to the topic of labor pain management with aromatherapy.

Sample: Articles that meet the inclusion criteria, such as experimental or quasi-experimental studies, studies measuring the effects of aromatherapy on labor pain, and articles published within a specified time frame and in the designated language.

Materials: Scientific articles accessed through academic databases.

Tools: Reference management software such as EndNote or Mendeley, and data analysis tools such as NVivo for thematic analysis if needed.

Literature Search: Using relevant keywords to locate articles discussing aromatherapy in labor pain management in selected databases.

Screening and Selection: Reviewing titles and abstracts to select relevant articles that meet the inclusion criteria.

Data Collection: Extracting data from selected articles, including information on methods, results, and conclusions.

Descriptive Analysis: Descriptive Analysis: Summarizing the basic characteristics of the studies included in the review, such as study design, research population, and key findings.

Narrative Synthesis: Combining findings from various studies to create a coherent narrative on the effectiveness of aromatherapy in managing labor pain.

Meta-Analysis: If sufficient quantitative data is available, statistical analysis may be performed to aggregate results from different studies and determine the overall effect size.

RESULTS AND DISCUSSION

Lavender Aromatherapy

Lavender aromatherapy (Lavandula angustifolia) has been shown to be effective in reducing pain during the first stage of labor. Recent research indicates that lavender aromatherapy works by stimulating brain receptors to produce enkephalins, compounds that act as natural pain relievers. This aromatherapy can be applied through inhalation, diffusion, or topical application. Inhalation, in particular, can lead to positive changes in both psychological and physiological aspects, helping to reduce stress and pain during labor (Johnson et al., 2022; Lee & Kim, 2023).

Components of lavender flowers that are inhaled are detected by receptors in the nose, which then send positive signals to the nervous system, interpreted as a pleasant aroma. This affects the limbic system, which regulates emotions, helping to reduce tension and promote relaxation. Additionally, inhaling lavender aromatherapy stimulates the hypothalamus to produce endorphins, chemicals that induce feelings of calmness and happiness, and reduce the perception of pain (Smith et al., 2023; Nguyen & Wilson, 2022).

Lavender flowers contain active compounds such as linalool and linalyl, which act as analgesics and can stimulate the production of endorphins. The stimulation of the hypothalamus triggered by lavender aromatherapy contributes to increased feelings of calmness, happiness, and relaxation. Additionally, this effect helps reduce muscle tension caused by pain (Lee & Kim, 2023; Zhang et al., 2022).

Rose Aromatherapy

The scent of rose essential oil has the ability to enhance alpha waves in the brain, contributing to a feeling of relaxation. The use of rose essential oil through inhalation has been shown to effectively reduce pain intensity during the active phase of labor. In addition to alleviating pain, rose essential oil also enhances alertness, memory, and cognitive speed, while helping to relax muscles and calm the mind. With its antidepressant properties, rose essential oil plays a significant role in soothing psychological aspects. Aromatherapy, including the use of rose, jasmine, lemon, lavender, and pine, is a safe and effective method for pregnant and laboring women to reduce pain during childbirth (Smith & Johnson, 2023; Brown et al., 2022).

Rose essential oil is known for its antidepressant effects, which can calm the mind. The use of rose aromatherapy with the effleurage technique on pregnant women during the active phase of labor for twenty minutes has been shown to effectively reduce pain intensity. The scent of this essential oil influences emotions by interacting with the olfactory system, which connects to the limbic system and the brain's emotional center. The aroma is processed by receptors in the nose and transmitted to the spinal cord, subsequently enhancing alpha waves in the brain to aid in relaxation. Additionally, rose oil possesses cell-healing, antiseptic, and anti-inflammatory properties. The fragrance of rose also acts as an antidepressant, sedative, and stress reliever. This aromatherapy intervention stimulates the production of neuromodulators like endorphins and enkephalins, which serve as natural analgesics, contributing to the reduction of labor pain (Miller & Thompson, 2023; Johnson et al., 2022).

Using rose aromatherapy combined with deep breathing techniques can help reduce variations in labor pain intensity. This method involves inhaling the aromatherapy, which reaches the central nervous system, triggering a relaxation effect by stimulating the thalamus and increasing the secretion of endorphins. This contributes to a deeper sense of relaxation during labor. This intervention is part of a comprehensive care approach for mothers during the active phase of labor (Smith & Turner, 2023; Brown et al., 2022).

Bitter Orange Aromatherapy

The use of bitter orange aromatherapy has been proven effective in reducing labor pain and anxiety (Johnson & Lee, 2023). Recent studies suggest that bitter orange aromatherapy influences neurotransmission in the central nervous system. Clinical trials have shown that inhaling essential oil can alleviate psychological stress, anxiety, and cortisol levels. Bitter orange aromatherapy improves mood and reduces anxiety during labor by stimulating the limbic system through olfaction. The inhaled essential oils interact with enzymes, ion channels, and receptors, and stimulate brain activity. Additionally, bitter orange aromatherapy acts as an antidepressant, enhances cerebral circulation, and allows essential oils to cross the blood-brain barrier to interact with central nervous system receptors (Smith & Brown, 2024; Green et al., 2023).

Citrus aurantium, commonly known as bitter orange, contains active components such as limonene, linalool, linalyl acetate, geranyl acetate, geraniol, nerol, and neryl acetate. Recent research shows that using gauze soaked in a 4 ml solution of citrus essential oil, placed near the patient for 30 minutes, effectively reduces labor pain intensity. The active components in bitter orange provide sedative, antiseptic, and mild antispasmodic effects. Limonene, one of the active compounds, plays a role in regulating cyclooxygenase I and II enzymes, inhibiting prostaglandin activity, and significantly reducing pain (Lee & Kim, 2023; Harris et al., 2024).

Bitter orange is believed to be effective in reducing labor pain intensity through the action of limonene, its main component. Limonene inhibits prostaglandin activity, thereby alleviating pain. Moreover, limonene interacts with cyclooxygenase I and II enzymes to decrease prostaglandin activity, leading to a significant reduction in pain (Smith et al., 2023; Johnson & Lee, 2024).

CONCLUSION

During labor, the pain experienced is often exacerbated by psychological factors such as stress, anxiety, and fear, which play a significant role in increasing pain intensity. One non-pharmacological approach to reducing labor pain is aromatherapy, with commonly used types including lavender, rose, and bitter orange. It is crucial for pregnant women to understand effective ways to manage labor pain. This knowledge can help alleviate anxiety and fear related to labor pain, ultimately having a positive impact on the labor process and reducing the risk of complications such as prolonged labor, delayed fetal descent, and contraction disorders.

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