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Aromatherapy and Essential Oils: Strategies to Reduce Menopausal Symptoms

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Abstract

Menopause often triggers a variety of physiological and psychological discomforts such as hot flashes, anxiety, insomnia, and mood swings, significantly impacting women's quality of life. Many women seek natural alternatives to hormone replacement therapy, leading to increased interest in aromatherapy and essential oils as complementary treatments. This study aimed to analyze and synthesize scientific evidence regarding the effectiveness of aromatherapy and essential oils in alleviating menopausal symptoms. Using a literature review method, this study systematically reviewed studies published between 2000 and 2025 through databases including PubMed, ScienceDirect, Scopus, and Google Scholar. The results revealed that essential oils, particularly lavender, clary sage, peppermint, and geranium, show significant potential in improving emotional stability, sleep quality, and vasomotor regulation. Thematic content analysis demonstrated that aromatherapy influences mood and hormonal balance through neurochemical and physiological mechanisms related to the limbic system and endocrine function. Despite variations in methodology, the findings consistently support aromatherapy as a safe, non-invasive, and effective complementary therapy for menopausal women. This study contributes to holistic healthcare by strengthening the integration of evidence-based aromatherapy into women's health strategies while emphasizing the need for further standardized, long-term clinical trials.

Keywords Aromatherapy, Essential Oils, Menopause, Menopausal Symptoms.

INTRODUCTION

Traditional practices using aromatic plants have been a valuable resource for addressing emotional and physical human ailments for centuries. These plants are a rich source of potentially potent compounds for the treatment of various diseases and have contributed to the enrichment of a large number of pharmacological compounds used in conventional therapies; in fact, they remain a promising source for the development of new drugs (Yuan et al., 2016). For centuries, traditional healing practices have relied on the therapeutic properties

of aromatic plants to manage a wide range of physical and emotional disorders. Ancient civilizations, including the Egyptians, Greeks, Chinese, and Romans, used aromatic herbs and oils for religious rituals, embalming, and medicinal purposes. These plants contain potent bioactive compounds that exert physiological and psychological effects, many of which have inspired the development of modern pharmacological treatments (Yuan et al., 2016). Although scientific and technological progress has introduced advanced therapeutic modalities such as nanomedicine, molecularly targeted therapies, regenerative medicine, and artificial intelligence-based digital health tools (Doroudian et al., 2021; Yan et al., 2020; Karbasi et al., 2020; Ellahham, 2020) the global community has witnessed a renewed interest in natural and holistic approaches to health care. Complementary and alternative therapies, particularly aromatherapy using essential oils, have gained substantial attention as evidence-based methods for enhancing psychological and physiological well-being, minimizing stress, and improving quality of life in a safe and cost-effective manner (Ayik et al., 2018).

Aromatherapy, which employs volatile essential oils extracted from various plant parts such as flowers, leaves, bark, roots, and fruits, represents one of the most accessible and widely practiced complementary health approaches (Gnatta et al., 2016). The French chemist René Maurice Gattefossé introduced the term "aromatherapy" in the early 20th century after discovering the healing properties of lavender oil in treating burns. Since then, numerous studies have validated the therapeutic potential of essential oils (EOs) in alleviating symptoms related to stress, anxiety, insomnia, pain, and depression (Barao et al., 2021; Contrada et al., 2021). The physiological mechanisms underlying these effects involve the olfactory system and the limbic structures of the brain, which regulate emotional responses, hormone secretion, and autonomic nervous system activity. Thus, aromatherapy can influence the release of neurotransmitters and hormones such as endorphins, serotonin, and cortisol, creating a state of relaxation and emotional balance (Herz, 2009; Valnet, 1980). The growing body of evidence supporting aromatherapy's psychophysiological effects has encouraged health professionals to incorporate it into holistic care practices worldwide.

Despite its historical roots, the contemporary significance of aromatherapy lies in its integration into evidence-based complementary medicine. Essential oils possess diverse chemical compositions mainly terpenes and phenylpropanoids that are responsible for their distinctive aromas and pharmacological activities (Aponso et al., 2020). These compounds are biosynthesized through the mevalonate, methylerythritol, and shikimic acid pathways and extracted using techniques such as hydrodistillation, solvent extraction, or supercritical fluid extraction (Thangaleela et al., 2022). The chemical complexity of EOs allows them to exert multiple biological effects, including antimicrobial, anti-inflammatory, anxiolytic, analgesic, and neuroprotective properties (Ayaz et al., 2017; Caballero-Gallardo et al., 2022). Several oils, such as lavender, rosemary, jasmine, peppermint, and chamomile, have been shown to improve mood, enhance sleep quality, and reduce physiological markers of stress (Ahmad et al., 2017). These findings demonstrate that aromatherapy has both physical and psychological benefits, providing a holistic alternative to pharmacotherapy, which often produces

undesirable side effects such as dependency, lethargy, and tolerance (Malcolm et al., 2018).

In the context of women's health, aromatherapy has gained prominence for its potential to alleviate symptoms associated with menopause a natural but often distressing phase marked by the cessation of menstruation due to declining estrogen levels. Menopause is characterized by a wide range of physiological and psychological symptoms, including hot flashes, night sweats, anxiety, depression, insomnia, fatigue, and cognitive disturbances (Kang et al., 2015). Hormonal replacement therapy (HRT) has long been regarded as the most effective treatment for managing vasomotor and psychosomatic symptoms of menopause. However, growing evidence links long-term HRT use to an increased risk of breast cancer, cardiovascular diseases, and thromboembolic events (Fe et al., 2016; Dennerstein et al., 1993). Consequently, many women have turned to non-pharmacological and natural therapies to improve their quality of life during the menopausal transition. Aromatherapy has emerged as one of the most promising approaches because it not only addresses physical symptoms but also improves emotional and psychological well-being without significant adverse effects (Tiran et al., 2004; Taavoni et al., 2013).

Previous studies have reported the beneficial effects of specific essential oils in mitigating menopausal symptoms. For instance, lavender oil has been shown to reduce anxiety, depression, and insomnia, possibly through its sedative and anxiolytic components linalool and linalyl acetate (Lwin et al., 2016; Rasch et al., 2007). Fennel oil, rich in phytoestrogens, has been found to alleviate vasomotor symptoms, enhance sexual satisfaction, and improve sleep quality in postmenopausal women (Schredl et al., 2009). Moreover, combinations of essential oils such as lavender, fennel, rose, and geranium have demonstrated synergistic effects in relieving psychological distress and sexual dysfunction (Ko et al., 2021). Despite these promising findings, several research gaps remain. Many studies have focused on single-oil interventions, small sample sizes, or short-term outcomes, making it difficult to generalize findings across populations. Additionally, variations in oil composition, dosage, application method (inhalation, massage, or oral), and treatment duration have led to inconsistent results regarding efficacy and mechanism of action (Barnes et al., 2022). There is also limited understanding of how essential oils modulate neuroendocrine and hormonal pathways to reduce menopausal discomforts, particularly through cortisol and estrogen regulation.

The uniqueness of this study lies in its comprehensive synthesis of current literature concerning the therapeutic use of aromatherapy and essential oils for managing menopausal symptoms. Unlike prior reviews that primarily emphasized general psychological outcomes such as anxiety or depression, this article focuses specifically on the intersection between essential oils' biological activities and their physiological effects during menopause. It explores both direct mechanisms such as phytoestrogenic activity, vasodilation, and neurohormonal modulation and indirect mechanisms, including stress reduction, improved sleep quality, and enhanced emotional stability. By evaluating multiple essential oils and their combinations, this study aims to present a more holistic understanding of aromatherapy's multifaceted benefits

for menopausal women, bridging the gap between traditional healing knowledge and modern scientific evidence.

Therefore, the purpose of this article is to review and synthesize available scientific evidence regarding the effectiveness of aromatherapy and essential oils as complementary strategies for alleviating menopausal symptoms. The review highlights the pharmacological basis of essential oils, their mechanisms of action, application methods, and the clinical outcomes reported in different studies. Furthermore, it identifies the limitations of existing research and proposes future directions for developing standardized, evidence-based aromatherapy protocols for menopausal care. Through this approach, the article seeks to promote greater recognition of aromatherapy as a safe, natural, and effective therapeutic option that can enhance women's physical and emotional well-being during menopause.

METHODS

This study employed a literature review method to synthesize and analyze existing scientific evidence regarding the use of aromatherapy and essential oils in alleviating menopausal symptoms. The literature review was conducted systematically between May and September 2025 to ensure a comprehensive and up-to-date overview of the topic. The research followed a structured process consisting of four main stages: identification, screening, eligibility, and synthesis. During the identification stage, relevant literature was searched using electronic databases such as PubMed, Google Scholar, ScienceDirect, Scopus, and SpringerLink. Keywords and Boolean combinations including "aromatherapy," "essential oils," "complementary and alternative medicine," "menopause," "menopausal symptoms," and "therapeutic effects" were used to locate peer-reviewed journal articles published in English between 2000 and 2025. This time frame was chosen to capture both classical and contemporary studies that reflect the evolution of aromatherapy as a complementary treatment.

The data collection process involved selecting articles that met the inclusion criteria, which consisted of (1) original research or systematic reviews focusing on the use of essential oils for managing psychological or physiological menopausal symptoms; (2) studies published in reputable, peer-reviewed journals; and (3) research that provided clear descriptions of methods and measurable outcomes. Exclusion criteria included duplicated articles, non-peer-reviewed materials, abstracts without full text, and studies focusing on non-menopausal populations. Data were extracted from selected studies using a structured data extraction form that included details on author, publication year, research design, sample characteristics, type of essential oils used, application method, treatment duration, and outcomes measured. The extracted data were then categorized based on the type of symptom relief (e.g., anxiety reduction, sleep improvement, vasomotor regulation, pain relief, and mood stabilization).

The data analysis technique used in this review was thematic content analysis, which aimed to identify recurring patterns, key findings, and emerging trends from the reviewed literature. Each study was critically examined to evaluate its methodological rigor, reliability,

and relevance to the research question. Thematic coding was applied to group similar findings under major categories such as psychological effects, physiological mechanisms, and hormonal modulation associated with aromatherapy. Comparative analysis was used to contrast the effectiveness of different essential oils and application methods (e.g., inhalation, massage, or topical use) across various study contexts. To ensure validity, triangulation of data sources was applied by comparing outcomes from clinical trials, experimental studies, and systematic reviews. The results of this synthesis were then interpreted to provide an integrated understanding of how aromatherapy and essential oils can be effectively utilized as complementary strategies for managing menopausal symptoms and to identify existing research gaps for future investigation.

FINDINGS AND DISCUSSION

The findings of this literature review reveal that aromatherapy and essential oils have shown consistent potential in alleviating both psychological and physiological symptoms associated with menopause. The analysis of more than thirty peer-reviewed studies indicated that essential oils, such as lavender, clary sage, geranium, peppermint, and rose, play a significant role in regulating mood, reducing anxiety, and improving sleep quality among menopausal women. Lavender oil, in particular, emerged as the most frequently studied and effective essential oil due to its anxiolytic and sedative properties. Inhalation and aromatherapy massage using lavender were found to significantly reduce cortisol levels, promote relaxation, and improve sleep patterns, as evidenced by multiple randomized controlled trials. These outcomes suggest that olfactory stimulation can activate the limbic system and hypothalamus, which are closely related to emotional balance and hormonal regulation.

Beyond psychological effects, the review also found substantial evidence that aromatherapy helps in alleviating vasomotor symptoms such as hot flashes, night sweats, and heart palpitations. Studies utilizing clary sage and peppermint oils demonstrated measurable decreases in the frequency and intensity of hot flashes. Clary sage oil, in particular, was reported to influence estrogen levels and serotonin activity, leading to improved thermoregulation and reduced emotional fluctuations. Furthermore, when combined with massage therapy, essential oils facilitated better peripheral blood circulation and parasympathetic activation, which contributed to an overall sense of calm and body temperature stability. These results suggest that aromatherapy can serve as a supportive, non-hormonal therapy for managing the discomforts of menopause, especially for women who prefer natural alternatives to hormone replacement therapy.

The thematic analysis also highlighted the importance of application methods and duration of treatment. Studies comparing inhalation, diffusion, and topical application revealed that aromatherapy massage yielded the most significant improvement across multiple symptom domains—particularly in anxiety, depression, and sleep disturbance. Treatment periods lasting between four to eight weeks produced the most noticeable effects,

indicating that aromatherapy's efficacy increases with consistent and prolonged use. However, the findings also suggest that individual response may vary depending on sensitivity to fragrance, quality of the essential oil, and adherence to treatment protocols. Thus, personalization of aromatherapy interventions appears crucial for maximizing therapeutic outcomes.

Another key finding pertains to the psychophysiological mechanisms underlying aromatherapy's effectiveness. The reviewed studies propose that essential oils influence the limbic system through olfactory pathways, modulating neurotransmitters such as serotonin, dopamine, and GABA, which are associated with mood regulation and stress reduction. Additionally, biochemical analyses indicate that certain compounds such as linalool and linalyl acetate in lavender, and sclareol in clary sage exhibit mild estrogen-like effects that may contribute to hormonal balance. This hormonal modulation is particularly beneficial in reducing the depressive and anxious states that often accompany declining estrogen levels during menopause. These mechanisms provide a plausible scientific explanation for the long-reported calming and restorative effects of essential oils.

Finally, the synthesis identified several research gaps. While many studies affirm the short-term benefits of aromatherapy, there remains a lack of longitudinal and large-scale clinical trials that assess long-term safety, optimal dosage, and potential interactions with other treatments. Moreover, cultural and contextual factors appear to influence the acceptability and perceived effectiveness of aromatherapy, suggesting that future research should incorporate cross-cultural comparisons and qualitative assessments of user experience. Overall, the reviewed evidence supports the conclusion that aromatherapy and essential oils constitute a promising complementary approach to reducing menopausal symptoms through multi-dimensional pathways psychological relaxation, physiological regulation, and hormonal modulation although further empirical validation is still required to establish standardized clinical guidelines.

The analysis of this study's findings demonstrates a convergence between contemporary empirical evidence and long-standing theoretical perspectives on the psychophysiological effects of aromatherapy. The results showing that lavender, clary sage, and peppermint oils effectively alleviate anxiety, hot flashes, and sleep disturbances in menopausal women are consistent with the findings of Lee and Lim (2020), who concluded that inhalation of lavender oil significantly reduced anxiety and improved sleep efficiency among postmenopausal participants. This alignment reinforces the theory proposed by Herz (2016) which posits that olfactory stimulation directly activates the limbic system the brain's emotional center leading to neurochemical responses that modulate stress hormones and enhance mood stability. From this theoretical standpoint, aromatherapy operates not merely as a sensory experience but as a neurobiological mechanism influencing emotional regulation, particularly relevant for menopausal women who experience hormonal-induced mood fluctuations.

Further analysis reveals that the positive effects of essential oils on vasomotor

symptoms, such as hot flashes and night sweats, can be linked to the physiological theories of hormonal modulation and homeostasis. Previous research by Choi et al. (2014) found that clary sage oil inhalation significantly reduced salivary cortisol and increased serotonin levels, suggesting a potential estrogen-mimicking action through the modulation of endocrine activity. This aligns with the biochemical theory of phytoestrogenic effects, which explains how certain plant-derived compounds can bind to estrogen receptors and exert mild hormonal effects. The present review supports this theoretical foundation, demonstrating that essential oils containing compounds like sclareol and linalool can subtly influence hormonal balance, contributing to thermoregulation and emotional calm. These findings underscore the dual role of aromatherapy as both a psychological and physiological intervention.

In relation to stress and emotional well-being, the findings corroborate the biopsychosocial model of menopause, which views menopausal symptoms as the result of interactions among biological, psychological, and social factors. Studies by Conrad and Adams (2012) and Babar et al. (2021) emphasized that interventions combining physical touch, scent, and relaxation such as aromatherapy massage enhance parasympathetic activity and reduce sympathetic dominance, leading to a measurable decline in perceived stress and anxiety. The present synthesis affirms this claim, as most reviewed studies reported that aromatherapy massage was more effective than inhalation alone. This observation can be interpreted through the theory of multisensory integration, suggesting that combined tactile and olfactory stimulation yields a synergistic effect on the nervous system. Thus, aromatherapy's effectiveness may stem not only from chemical constituents of essential oils but also from the holistic experience it provides incorporating relaxation, mindfulness, and self-care.

Moreover, the comparative analysis between short-term and long-term interventions revealed that sustained aromatherapy treatments (lasting more than four weeks) led to more stable improvements in mood and sleep quality. This finding supports the neuroadaptation theory, which suggests that consistent sensory exposure allows the nervous system to establish new equilibrium states that enhance emotional resilience. In this context, aromatherapy acts as a non-invasive stimulus capable of facilitating neuroplastic changes over time, particularly within stress-related neural circuits. Supporting this notion, Salles et al. (2022) observed that long-term exposure to lavender and bergamot oils increased heart rate variability, an indicator of improved autonomic balance, which corresponds with the findings of this review. Therefore, the consistency and duration of aromatherapy practices appear to be key factors in sustaining menopausal symptom relief.

The analysis also exposes notable research gaps and contradictions when compared to prior studies. While several experiments highlight significant reductions in anxiety and hot flashes, others, such as the study by Koyama et al. (2018), found no substantial hormonal changes after aromatherapy intervention, suggesting that the psychological benefits might outweigh direct endocrine effects. This discrepancy can be explained through the cognitive-behavioral framework, which posits that perceived symptom relief may arise from improved relaxation and expectancy effects rather than from biochemical alterations alone.

Consequently, aromatherapy may function partially as a placebo-enhanced therapeutic modality, in which belief, sensory enjoyment, and self-regulation collectively foster well-being. Recognizing this dimension aligns aromatherapy with holistic care paradigms that integrate mind-body interactions rather than isolating physiological mechanisms.

Finally, when interpreted through the lens of complementary and alternative medicine (CAM) theory, the findings of this review reaffirm the notion that healing should encompass the harmony of mind, body, and environment. Aromatherapy, as evidenced here, serves as a bridge between traditional wisdom and modern clinical practice. The reviewed studies collectively illustrate how essential oils, through their chemical complexity and sensory appeal, fulfill the principles of CAM by supporting self-healing, enhancing quality of life, and empowering women during the menopausal transition. Nevertheless, the lack of standardized dosages, varied oil quality, and small sample sizes across prior studies point to methodological limitations that future research must address. Therefore, while aromatherapy holds strong theoretical and empirical grounding as a complementary therapy for menopausal symptoms, its full clinical potential can only be realized through integrative research designs that combine biochemical assays, neuroimaging studies, and qualitative analyses of patient experience.

CONCLUSION

The findings of this literature review address the researcher's initial concern regarding the need for safe, natural, and effective alternatives to manage menopausal symptoms without relying solely on hormone replacement therapy. The synthesis of previous studies shows that aromatherapy and essential oils particularly lavender, clary sage, and peppermint possess significant therapeutic potential in reducing both psychological symptoms (such as anxiety, irritability, and sleep disorders) and physiological manifestations (such as hot flashes and night sweats). These benefits are achieved through neurochemical modulation, hormonal balancing, and relaxation effects that align with biopsychological theories of stress regulation. Therefore, aromatherapy can be considered a viable complementary therapy that supports women's well-being during the menopausal transition, offering comfort, emotional stability, and improved quality of life.

However, despite promising evidence, this study acknowledges several methodological and practical limitations. Most of the reviewed research utilized small sample sizes, short intervention durations, and heterogeneous treatment protocols, which limit the generalizability of results. The variability in essential oil quality, concentration, and delivery methods further complicates comparisons across studies. Moreover, the majority of findings relied on subjective self-reported measures rather than objective physiological indicators, potentially introducing response bias. These limitations highlight the need for more rigorous experimental designs that integrate biological markers such as hormone levels, brain imaging, or autonomic nervous system indicators to substantiate aromatherapy's underlying mechanisms.

Future research should therefore focus on conducting longitudinal and multicenter trials

with standardized protocols to assess both short- and long-term effects of aromatherapy on menopausal health. Comparative studies examining the efficacy of different essential oils, combinations, and modes of administration would also enhance clinical understanding. Furthermore, integrating qualitative methods could provide deeper insights into women's personal experiences and cultural perceptions of aromatherapy as part of holistic self-care. By bridging scientific rigor with cultural sensitivity, future investigations can strengthen the evidence base for aromatherapy and establish clear clinical guidelines, ensuring that this natural therapy becomes a validated and accessible option for menopausal women worldwide.

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