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(REVIEW ARTICLE)

# Aromatherapy in migraine management: A systematic review of essential oil efficacy, neurobiological mechanisms, and clinical evidence

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## Abstract

In recent years, an alternative complementary strategy for the management of migraines, one of the leading causes for neurological damage globally, has been investigated. Aromatherapy has been considered an option for treatment option. The main topics discussed in this systematic review are the pathophysiology of migraines, the scientific evidence for essential oils and the pharmacological actions of multiple essential oils. A few essential oils, for example peppermint and lavender, have been identified as having anti-migraine therapeutic properties. These oils have the capability to modulate vasomotor activity and decrease neurogenic inflammation, both of which are triggers for migraines. However, there is a need for higher quality randomized controlled studies to improve dosage and safety procedures. Based on the results of the study, it can be concluded that aromatherapy is a reliable and scientifically validated approach to the management of migraines.

**Keywords:** Aromatherapy; Migraine; Neurogenic Inflammation; Essential Oils; Peppermint Oil; Lavender Oil; Complementary Therapy; Pain Management

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## 1. Introduction

### 1.1. Background and Disease Burden

Migraine is a chronic disorder and a complex neurological disorder characterized by recurrent episodes of moderate to severe headache pain. It is frequently unilateral and associated with a broad spectrum of sensory abnormalities. Migraine is not only a common headache disorder but also a major cause of global productivity limitations. (1)

### 1.2. Clinical Presentation and Symptomatology

| | |
|---|---|
| Severe Pain | Often localized to one side of the head. |
| Nausea and Vomitting | Accompanied and Heightened sensitivity to light and sound. |
| Aura | Sensory changes or visual disturbances preceding the onset of the headache. |
| Debilitating Nature | Can have a profound impact on daily activities and quality of life. |

**Figure 1** Characteristic Signs and Symptoms of Migraine Attacks. (2-3)

### 1.3. Epidemiology and Global Prevalence:

Migraine is a widespread condition globally. The estimated incidence varies among different demographic groups.:

#### *1.3.1. Global Population*

Migraine is a widespread disorder that affects approximately 14%–15% of the global population. Recent meta-analyses have reported prevalence estimates as high as 23.5%-25.9% in adults as well. (2).

#### *1.3.2. Children and Adolescents*

The pooled prevalence between 8 to 18-year-olds is approximately 11%, with an upsurge from 5% in children aged 5–10 years old to 15% in adolescents (3).

#### *1.3.3. University Students*

Slightly increased prevalence about 16% has been identified in the student population (4).

#### *1.3.4. Working-Age Adults*

Migraine prevalence appears to have an inverted U-shaped distribution of age, with a peak in the 30s and 40s, and in this age group 30%–35% of females and about 20% of males have been affected (2).

### 1.4. Socioeconomic Impact and Disability

Migraine has a large and socioeconomic impact on individuals and health care system productivity:

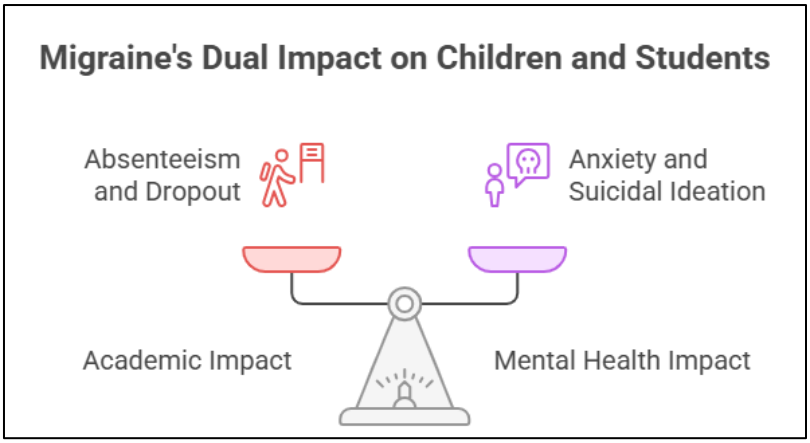


**Figure 2** Impact of Migraine on Productivity, Disability, and Mental Health (1,3,5)

### 1.5. Sex-Based Differences in Prevalence

As far as ten years of age, migraine prevalence is similar in boys and girls, but an unexpected sex difference is seen during and after puberty. Migraine is more common in adult women (estimates of 19% to 33.1%) than men (10% to 20.1%). Interestingly, although migraine is more common in women, some studies have indicated that the subjective anxiety symptoms associated with migraine may be more severe in men (5).

### 1.6. Aromatherapy and Its Relevance in Migraine Management

Aromatherapy is a holistic and complementary therapy for migraine, using essential oils from plants to relieve pain, reduce stress and improve general well-being. It may be utilized in combination with standard pharmacological therapies to reduce the frequency and severity of migraine attacks. (6).

#### *1.6.1. Pharmacological Mechanisms of Aromatherapy in Migraine*

Aromatherapy operates on the complex biological substrates of the migraine by three major mechanisms:

- **Vasomotor Balance:** Some essential oils can affect changes in intracranial and extracranial vessels (vasoconstriction and vasodilation) that are involved in the development of migraine pain (7).
- **Inhibition of Neurogenic Inflammation:** Essential oils can inhibit the release of pro-inflammatory neuropeptides such as Substance P and calcitonin gene-related peptide (CGRP) and block inflammatory signal pathways like NF-κB and MAPK pathways (8).
- **Central Pain Sensitization:** Aromatherapy may be involved in the increased sensitivity of the brain to painful stimuli, and thus reduce symptoms such as photophobia and phonophobia (7).

#### *1.6.2. Essential Oils with Demonstrated Anti-Migraine Activity*

The following essential oils have shown specific anti-migraine properties in clinical and pre-clinical studies:

- **Peppermint:** It has an rapid analgesic effect, generally within five minutes of inhalation. The main active constituent, menthol, acts on pathways of pain sensitization and neurogenic inflammation (6,7).
- **Lavender:** The study has shown that lavender is effective in diminishing the severity of migraines and migraine-related symptoms like nausea and vomiting and has a relaxing effect on the parasympathetic nervous system (9).
- **Chamomile:** This is usually applied as a gel to the temples. It has been found to reduce pain, nausea and sensitivity to light and sound.
- **Anise:** Its regular use has been reported to reduce the frequency of migraine attacks by almost 50% a week.
- **Basil:** Used on the frontal and temporal regions, decreases pain intensity and frequency of episodes (8).
- **Rose:** It is particularly useful in heat migraine syndrome with symptoms like erythema of eye and heat sensation in the face (6).
- **Garlic:** May decrease migraines through reducing neurogenic inflammation and cortical spreading depression (CSD) (7).

*1.6.3. Practical Application Guidelines*

Selection and Procurement

Select a suitable essential oil according to the patient's symptomatology (e.g., peppermint for immediate alleviation, lavender for tranquillity and stress-induced responses). Products must be procured from regulated suppliers (e.g., accredited community pharmacies) to guarantee purity and therapeutic efficacy. (9)

Dilution Protocol

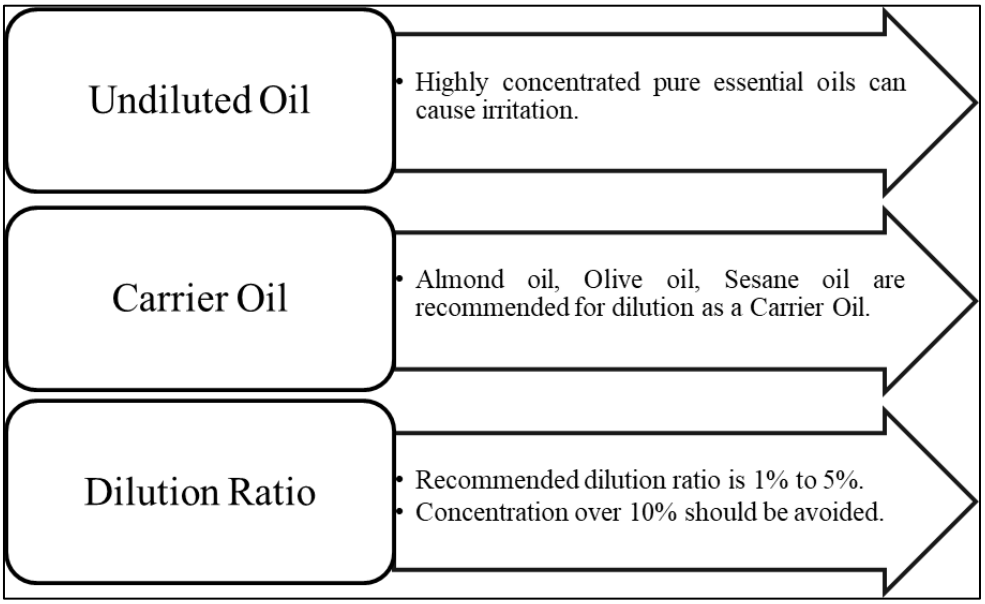


**Figure 3** Guidelines for Safe Dilution and Application of Essential Oils (9)

Methods of Application

- **Topical Massage** The diluted preparation applied to the temples, forehead and base of the neck for a 15 minute massage has been shown to decrease the severity of pain.
- **Inhalation Benefits:** Place 2-3 drops of essential oil on the upper lip or in the nostrils or diffuse in an enclosed space. Pre-mixed aromatherapy roll-on products are easily portable and have an instant cooling effect. (6).

Dosage Frequency and Duration

For effective long-term migraine management, treatment is advised three times weekly for a minimum duration of 15 minutes per session, sustained for at least three weeks. Prolonged application of combined formulations (e.g., lavender and grapeseed oil) has yielded enduring symptom relief for up to one year in certain patients. (8).

Safety Considerations

- **Osmophobia:** For patients with osmophobia (increased sensitivity to odors), lower concentrations or topical-only application should be used, as strong olfactory stimuli can worsen symptoms (10).
- **Allergic Reactions:** Adverse reactions to lavender and peppermint oils are uncommon; however, cutaneous monitoring during the first application is recommended (9).
- **Professional Consultation:** Many users do not know about possible side effects, so it is suggested that a qualified pharmacist should be consulted before starting aromatherapy (10).

### 1.7. Rationale

Essential oils are tested for migraine treatment due to the disorder's high health burden and growing interest in aromatherapy among affected individuals. High prevalence, recurrence, and intense pain make migraines a major public health issue (Ruifang Yuan et al., 2020). Patients seeking alternative therapies are drawn to aromatherapy's "comfortable and pleasant natural attributes" and "swift and effective" pharmacological effects. Traditional Chinese folk medicine uses this technique (Ruifang Yuan et al., 2020). Despite the increased interest, clinical evidence is inconsistent

across essential oils and research methods. This research domain must be thoroughly evaluated to inform evidence-based clinical decisions.

*Objectives*

The primary objectives are as follows:

- To elucidate the pathophysiology of migraine headaches and the underlying neurobiological mechanisms that make them amenable to aromatherapeutic intervention.
- To investigate the clinical and experimental evidence for the use of plant-derived essential oils in migraine prevention and treatment.
- To investigate the pharmacological basis and mechanisms of action associated with important essential oils used in migraine treatment.

## 2. Methods

A comprehensive narrative systematic review of the peer-reviewed literature was conducted by us. Databases like PubMed, Scopus, EMBASE and Google Scholar, were searched till present date for studies. The search terms used were “aromatherapy”, “essential oils”, “migraine”, “peppermint oil”, “lavender oil”, “chamomile”, “anise oil”, “basil oil”, “rose oil”, “garlic oil”, “neurogenic inflammation”, and “pain sensitisation” (individually and in combination). Studies were included if they studied pharmacological, clinical or mechanistic effects of the given essential oils in the context of migraine pathophysiology. Only human clinical trials and validated experimental studies in animals or in vitro were considered. Herein are summarised the mechanistic evidence for each essential oil reviewed.

### 2.1. Peppermint Oil (Mentha piperita)

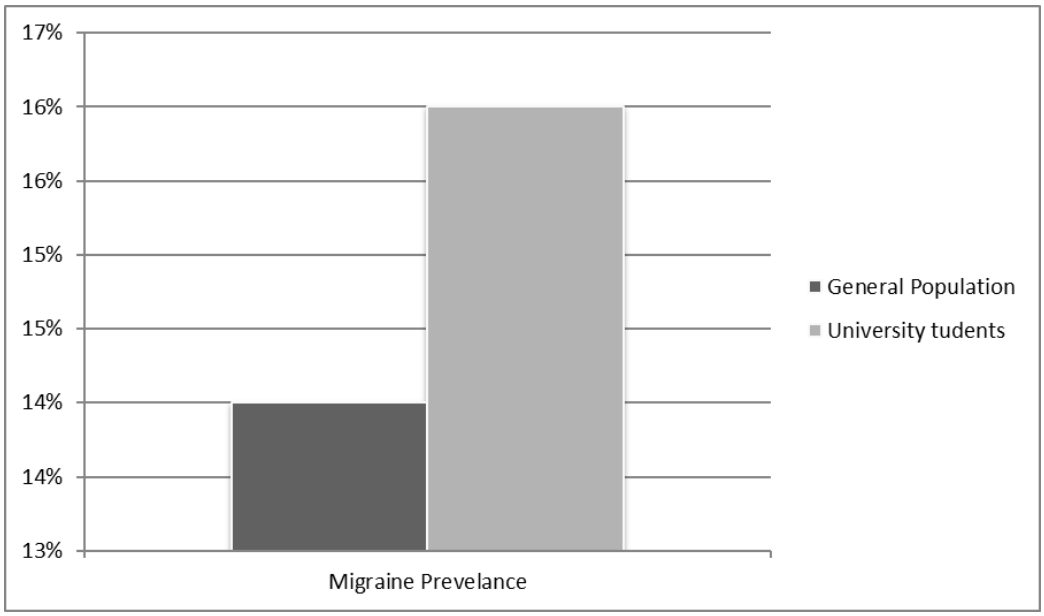


**Figure 4** Global and Student Population Prevalence of Migraine. (11)

Menthol, the main active ingredient in peppermint oil, is a state-selective blocker of sodium channels that are voltage-gated (Nav1.8, Nav1.9 and TTX-sensitive Na+ channels). These channels are important mediators of nociceptive signaling. Menthol function as an analgesic by blocking these channels in a concentration-, voltage- and frequency-dependent manner (12).

A different mechanism is the activation of transient receptor potential melastatin-8 (TRPM8) channels by menthol, which results in cooling sensation and reduction of mechanical allodynia and thermal hyperalgesia. Paradoxically, high concentrations of menthol are also involved in pain sensitization by sensitizing TRPM8 and activating TRPA1. Central metabotropic glutamate receptors and κ-opioid signaling pathways also mediate menthol-induced analgesia, and blockade of voltage-gated sodium channels and calcium influx also contribute (13).

TRPM8 is the major mediator of menthol-induced analgesia for acute and inflammatory pain through endogenous opioid-dependent mechanisms. Genetic and pharmacological studies in mouse models have backed up its key role in pain relief. (14).

Preclinical and review evidence indicates that menthol activates TRPM8 receptors, reduces calcium ion influx and increases pain thresholds. However, the authors admit that further work in human populations is still needed to validate the full clinical utility of peppermint oil in the management of migraine (15).

Menthol causes analgesic effects by inhibiting voltage gated Na+ and Ca2+ channels in the central nervous system and thus reducing neuronal excitability and pain hypersensitivity. Anti-nociceptive effects of GABA receptor activation also have been shown to be involved in inflammatory pain in experimental models of cultured dorsal horn neurons and systemic administration paradigms (16).

### 2.2. Lavender Oil (Lavandula angustifolia)

Lavender essential oil has been shown to have therapeutic effects on neurological disorders such as migraine through mechanisms involving modulation of GABA-mediated inhibitory neurotransmission. However, the existing evidence is limited by the small number of low-quality clinical studies and the specific effects on the parasympathetic Nervous and migraine-associated symptoms need further characterization (17).

In a randomized clinical study involving 60 participants, lavender aromatherapy has been effective to reduce depression and headache disability in migraine patients (18).

In vitro evidence suggests lavender oil may affect NMDA receptors and serotonin transporters, interactions that may be relevant to autonomic nervous system activity, but little direct clinical evidence exists to support this mechanism for the reduction of migraine intensity or nausea. (19).

The present study supports the role of lavender oil inhalation as an effective treatment modality for the management of acute migraine. In a placebo-controlled clinical trial of 47 patients, inhalation of lavender essential oil significantly reduced the severity of headaches caused by migraine compared to placebo [4].

Importantly, this study did not investigate specific neurophysiological effects on parasympathetic tone or symptoms such as nausea (20).

The investigations on relaxative effects of lavender on parasympathetic nervous have been started, but the direct effects on migraine intensity and associated symptoms need to be investigated in dedicated trials (21).

### 2.3. Chamomile (Matricaria chamomilla)

Phytochemical analysis of the flower extract of the German *chamomile (Matricaria chamomilla)* has revealed 22 polyphenolic compounds and 14 amino acids. Glycine has been reported to increase analgesic activity via interactions with $GABA_2$, NMDA receptors and inhibition of lipoxygenase-5 (LOX-5) among these as demonstrated by in vivo studies in rodents and molecular docking analyses (22).

Network pharmacology analysis suggested that the active ingredients in volatile oil of German chamomile may regulate T-cell lymphatic subpopulations, inhibit Th17 cell differentiation and reduce inflammation by modulating IL-17, NF-κB and MAPK signaling pathways. However, this analysis is not concerned with direct analgesic properties or interactions with classical pain pathways (23).

In a randomized double-blind clinical trial on 128 participants, inhalation of chamomile oil significantly decreased pain intensity in primiparous women after cesarean section. However, the specific active compounds responsible for this activity were not identified or mechanistic interactions with pain pathways characterized (24).

A comprehensive review of biochemical properties and ancient medicine applications has shown that active phytochemical constituents of chamomile oil, including chamazulene, bisabolol oxide, and apigenin, act on pain pathways by inhibiting the expression of inducible nitric oxide synthase (iNOS), releasing nitric oxide (NO), and exerting anti-inflammatory effects (25).

The main active compounds of chamomile oil are α-bisabolol oxide A and B, with α-bisabolol oxide B having affinity to tyrosinase, which may affect pain-relevant pathways. These results are supported by GC analysis and molecular docking studies (26).

### 2.4. Anise Oil (Pimpinella anisum)

Ruifang Yuan et al. (2020) conducted a comprehensive review on the anti-migraine mechanisms of essential oils, identifying 16 bioactive monomers that may work by "efficiently inhibiting neurogenic inflammation, hyperalgesia and balancing vasorelaxation. But the study doesn't state which of these are components of anise oil, or define their exact molecular pathways in the context of migraine.

S. Mosavat et al. (2019) conducted a pilot randomized placebo-controlled clinical trial to investigate the clinical efficacy of anise oil in the management of migraine headache. Available data indicate that weekly migraine attack frequency was reduced by approximately 50% compared with baseline, but the published abstract did not specify the neurochemical mechanisms. (27)

The known neurochemical substrates of migraine, such as monoaminergic and peptidergic pathways, involving calcitonin gene-related peptide (CGRP) and serotonergic systems (Karsan, 2024), offer a plausible mechanistic explanation for the observed clinical effects of anise oil, although a direct pharmacological link to specific constituents of anise oil remains to be determined in future studies (27–29).

### 2.5. Basil Oil (Ocimum basilicum)

In a clinical trial in 74 patients, supplementation with ω-3 fatty acids and nano-curcumin decreased migraine frequency, severity, and duration by downregulating cyclooxygenase-2 (COX-2)/inducible nitric oxide synthase (iNOS) mRNA expression and circulating serum levels during a 2-month intervention period (30). These results provide a relevant pharmacological background in the evaluation of the anti-inflammatory mechanisms of basil oil.

A triple-blind randomized clinical trial with 144 participants demonstrated that basil essential oil significantly decreases the severity and frequency of migraine attacks. Greater therapeutic effects were found for higher doses and longer duration of use, with significant dose-time interaction effects ($p < 0.001$) (31).

Basil essential oil has analgesic properties, mainly mediated via delta and mu-opioid receptor pathways, suggesting its potential for pain relief in inflammation, and hence relevance to the pain mechanisms underlying migraine. This mechanistic pathway was based on experimental pain models in the mouse (32).

In a phase 2 cohort study, prospective and non-controlled, of Lippia alba hydro-alcoholic extract, a plant related to basil, significant reductions in migraine pain intensity and frequency were observed, with more than 80% of patients achieving at least a 50% reduction in both pain intensity and frequency (33).

### 2.6. Rose Oil (Rosa damascene)

As of now, there is no definitive molecular-level mechanistic explanation in the existing literature for the interaction between rose oil and migraine pathophysiology. However, the clinical and experimental evidence available is as follows:

M. Niazi et al. (2017) conducted a double-blind placebo-controlled trial enrolling 40 patients that showed that topical application of rose oil significantly reduced the intensity of pain in patients presenting “hot-type” migraine at 30 to 120 minutes post-application, although effects were not statistically significant in the general migraine population (35).

In a systematic review, Safieh Mohebitabar et al. (2017) combined data from 13 clinical trials with 772 participants and confirmed the analgesic and relaxation effects of rose oil, although detailed mechanistic information was not provided (36).

On a pathophysiological level, Wienholtz et al. (2018) found that patients suffering from migraine have an altered reactivity of the extracranial vasomotor system and asymmetrical blood flow in the face, reflecting a dysfunction of the autonomic nervous system (37). Moreover, activation of TRPM8 channel has been reported to alleviate migraine-related thermal allodynia through inhibition of TRPV1 a mechanism that may be relevant to the heat perception symptoms targeted by rose oil, although the specific role of rose oil in this pathway is yet to be characterized (38).

### 2.7. Garlic Oil (Allium sativum)

Garlic oil appears to inhibit cortical spreading depression (CSD), a phenomenon central to migraine pathogenesis, through suppression of synaptic plasticity and prevention of associated neurogenic inflammation via reduction of immune cell activation. The existing evidence base is still mainly preclinical.

Garlic oil reduced CSD amplitude in rat neocortical slices dose-dependently (Marschollek et al., 2016). Systemic administration for 3 days prevented CSD-induced reactive astrocytosis and reduced both the amplitude and frequency of CSD events. The proposed mechanism involves inhibition of synaptic plasticity and field excitatory postsynaptic potentials (39).

Shih et al. (2010) showed that garlic oil inhibited the dynamics of cytoskeletal assembly-disassembly, which reduced the migration velocity and chemotactic responsiveness of neutrophil-like cells, indicating significant anti-inflammatory potential for neurogenic inflammation (40).

However, the current evidence does not establish an explicit mechanistic link between garlic's CSD-suppressing activity and its anti-neurogenic inflammatory effects.

A major limitation of the current evidence is that all investigations are from in vitro and animal models; no human clinical trials investigating garlic oil for migraine management have been reported in the identified literature. Moreover, the exact active components that are responsible for the observed effects remain to be determined (Marschollek et al., 2016) (39).

## 3. Results and Discussion

### 3.1. Overview of Evidence Across Essential Oils

This systematic review collated clinical, pharmacological and mechanistic evidence for seven essential oils used in the prevention and treatment of migraine. The strength of the evidence for oils is highly variable with respect to study design, sample size and mechanistic specificity. Table 1 summarizes the main findings in a comparative manner.

**Table 1** Comparative Summary of Essential Oils Reviewed for Migraine Management

| Essential Oil | Primary Mechanism | Evidence Type | Efficacy Level | Key Citation |
|---|---|---|---|---|
| Peppermint | TRPM8 activation; Nav blockade; GABA modulation | RCT + Animal models | High | (12–16) |
| Lavender | GABA inhibition; NMDA / serotonin modulation | RCT (n=47, 60) | Moderate–High | (17–21) |
| Chamomile | LOX-5 inhibition; iNOS/NO suppression; NF-κB | RCT (n=128) + In vitro | Moderate | (22–26) |
| Anise | Neurogenic inflammation suppression; vasorelaxation | Pilot RCT | Emerging | (27–29) |
| Basil | Opioid receptor (δ/μ) mediation; COX-2/iNOS downregulation | Triple-blind RCT (n=144) | High | (30–34) |
| Rose | Autonomic modulation; TRPM8/TRPV1 interaction | RCT (n=40); SR (13 trials) | Moderate | (35–38) |
| Garlic | CSD suppression; anti-neurogenic inflammation | Preclinical only | Preliminary | (39, 40) |

### 3.2. Peppermint Oil: Strongest Mechanistic Evidence

Peppermint oil has the strongest and most mechanistically well-characterized evidence of the essential oils reviewed. The multi-target pharmacology of menthol including activation of TRPM8, blockade of voltage-gated sodium channels, modulation of GABA receptors, and modulation of κ-opioid pathways (12–16) provides a compelling mechanistic framework that aligns with the complex neurobiological underpinnings of migraine. Its rapid onset of action (within

approximately 5 minutes of inhalation) and favourable tolerability profile enhance its clinical utility (6, 7). In summary, the preclinical mechanistic data and the preliminary clinical evidence suggest that peppermint oil is the most pharmacologically plausible aromatherapeutic agent in the treatment of migraine at this time.

### 3.3. Lavender Oil: Clinical Efficacy with Mechanistic Gaps

In controlled trial settings, lavender essential oil has demonstrated clinically meaningful effects on migraine severity (20). It is plausible that its interaction with GABA inhibitory networks, NMDA receptors and serotonin transporters (17, 19) provides a mechanistic explanation for its observed analgesic and anxiolytic effects, particularly in view of the established role of serotoninergic dysregulation in migraine pathogenesis. But the major gaps in the evidence are the absence of large-scale, high-powered clinical trials and the limited characterisation of its effects on autonomic and parasympathetic tone. It is also shown to have a potential adjunctive therapy given the reduction in migraine-associated depression and disability in a randomized trial (n = 60) (18).

### 3.4. Chamomile: Multi-Target Anti-Inflammatory Profile

The pharmacological profile of chamomile oil is characterized by its multi-target anti-inflammatory activity, which involves LOX-5, NF-κB, MAPK, iNOS and NO-mediated pathways (22, 23, 25). These pathways are directly involved in the neurogenic inflammatory cascade underlying migraine attacks. Analgesic efficacy has been demonstrated in clinical trials of acute pain (24), but there are no specific clinical trials in migraine populations. The phytochemical diversity of chamomile, consisting of chamazulene, bisabolol oxides and apigenin, offers several potential therapeutic targets, but it is necessary to elucidate the relative contribution of each constituent to the overall anti-migraine effect.

### 3.5. Anise, Basil, and Rose Oils: Promising Evidence Requiring Expansion

Anise oil was found to reduce weekly migraine attack frequency significantly in a pilot randomized controlled trial (27). However, the mechanisms that underlie this effect are poorly characterized and larger confirmatory trials are needed. Well-designed triple blind clinical trial (n=144) (31) supported by mechanistic evidence for opioidergic analgesia (32) showed significant reductions in migraine intensity and frequency for basil oil. Rose oil has been shown to be selectively effective in heat-type migraine presentations (35) and is supported by a systematic review of 13 clinical trials (36); its mechanistic interaction with TRPM8/TRPV1 pathways is an interesting area for future investigation (38).

### 3.6. Garlic Oil: Preclinical Promise Awaiting Clinical Translation

Of the oils reviewed, garlic oil has the least mature evidence base, with all available data from in vitro and animal studies. Mechanistically, it potently inhibits CSD, an important pathophysiological event in migraine, and exerts anti-neurogenic inflammatory effects (39, 40). However, a major limitation is the lack of any data from human clinical trials. However, before considering garlic oil as a viable therapeutic option, clinical translation studies are urgently needed.

### 3.7. Safety Profile and Clinical Applicability

The safety profile of the essential oils reviewed is generally good. The main risks are cutaneous sensitisation and, in predisposed subjects, symptom aggravation through osmophobia. These risks are substantially reduced by dilution to 1%–5% in suitable carrier oils (9). Essential oils have little risk of systemic toxicity at therapeutic doses, unlike conventional pharmacological agents. This makes essential oils particularly suitable for patients looking for non-pharmacological adjuncts or for populations with contraindications to conventional analgesics.

But there are still big concerns over quality control and standardization. The therapeutic efficacy of essential oils is strongly determined by their chemical composition which is determined by botanical species, geographical origin, extraction method and storage conditions. Reproducibility of clinical outcomes is best ensured by using products from regulated and accredited suppliers. (9, 10)

#### *Limitations of the Current Evidence Base*

Several limitations of the reviewed literature should be acknowledged. Most clinical studies suffer from small sample sizes, short follow-up periods and heterogeneity in outcome measures limiting the generalizability of their results. Blinding of participants in aromatherapy trials is inherently difficult because of the unique odorous properties of essential oils, which could introduce performance and detection bias. In addition, mechanistic evidence for several oils (notably anise and rose) is obtained only from non-migraine-specific populations or in vitro models, limiting its direct applicability to migraine pathophysiology. Furthermore, the lack of standardized dosing protocols and regimens of administration in the studies complicates the comparison of studies.

## 4. Conclusion

This review looks at the evidence for using oils from plants to help treat migraine headaches. The evidence shows that aromatherapy works in a few ways that are important for migraine headaches. These ways include helping with blood vessel problems reducing inflammation and affecting pain receptors in the brain.

Now peppermint oil seems to be the best option with a lot of information about how it works and good results from studies. Lavender and basil oils also seem to work based on controlled trials. Chamomile oil has a lot of potential for reducing inflammation. There is some experimental evidence to back this up. Anise and rose oils show promise. Should be studied more but garlic oil is still in the early stages and needs to be tested on humans.

Aromatherapy is not meant to replace proven treatments for migraine headaches but it can be a helpful addition to these treatments. It is especially useful for patients who want to try something besides medication or who have concerns about taking much medication. Aromatherapy is also an option for patients who cannot use standard treatments.

To learn more about aromatherapy and essential oils we need to do research. This research should include well-planned studies that look at the safety and effectiveness of essential oils. We also need to study how essential oils affect the body and how they can be used in an effective way.

In the end aromatherapy is a treatment option that's accessible and backed by science. Essential oils like peppermint oil, lavender oil and chamomile oil may be able to help reduce migraine headaches when used correctly and under the guidance of a healthcare professional. Aromatherapy can be a part of a comprehensive approach, to treating migraine headaches and reducing the suffering that comes with them.

## Compliance with ethical standards

### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

### *Author Contribution*

First author: Concept. Second & Third authors: Data accumulation. Fourth author: Design and drafting, Fifth author: Data validation. Corresponding author: Overall validation.

### *Data Availability*

Data is available from the corresponding author on request.

### *Statement of Usage of Artificial Intelligence*

Open AI platform was used grammatical correction only.

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