



## Research Article

# Peppermint Aroma in Hospitals: A Scent-Sational Approach to Patient and Staff Well-Being

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**Citation:** Bali S, Khan MA (2023) Peppermint Aroma in Hospitals: A Scent-Sational Approach to Patient and Staff Well-Being. Curr Res Cmpl Alt Med 7: 190. DOI: 10.29011/2577-2201.100090

**Received Date:** 9 July 2023; **Accepted Date:** 14 July 2023; **Published Date:** 17 July 2023

## Abstract

Peppermint essential oil holds great promise for relieving patient distress in hospital settings. An extensive literature search, encompassing randomized clinical trials, was conducted to assess the influence of peppermint aroma on physical and mental health. Findings indicate peppermint aroma's effectiveness in reducing nausea, vomiting and anxiety, along with improving sleep quality, in conditions such as pregnancy, post-operative recovery, and chemotherapy. Peppermint aroma also demonstrates potential in managing fatigue, stress, and mild cognitive impairment. The aroma's influence extends to healthcare workers, enhancing alertness, memory, and accuracy, particularly in high-stress environments. The findings underscore the need to integrate peppermint aromatherapy into mainstream healthcare practices to optimize patient outcomes and enhance healthcare worker performance.

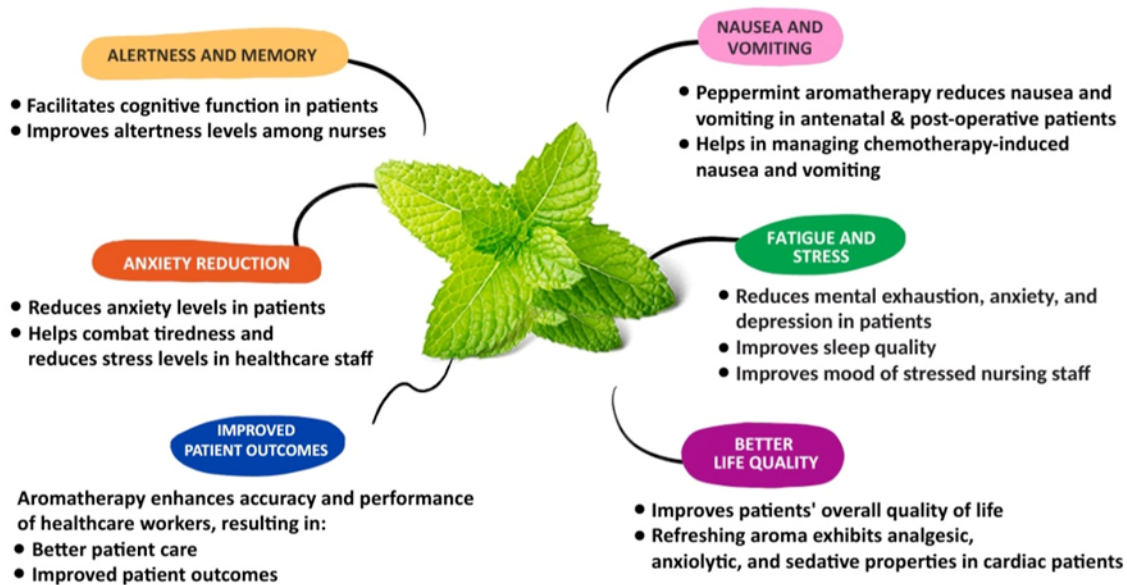
**Keywords:** Peppermint aroma; Aromatherapy in patients; Aromatherapy for nurses; Mahamrityunjaya mantra; Perfumes and health

## Introduction

Peppermint, recognized scientifically as *Mentha x piperita*, is a constituent of the Lamiaceae family, and is classified under the order Lamiales. Extracted through steam distillation from the plant's leaves, peppermint essential oil exhibits a potent, invigorating, and minty aroma that's refreshing to the senses [1].

The colour of the essential oil varies from clear to pale yellow, and is composed primarily of monoterpenes such as menthol and menthone, along with other components such as 1,8-cineole, limonene, and beta-caryophyllene [1]. The aromatherapy effect of peppermint has been intensively studied and found to positively impact various aspects of human health [2]. In clinical or hospital settings, the beneficial effects of peppermint aromas can be utilized for relieving patient distress and enhancing the mood and alertness of healthcare workers (see Figure). With a focus on patients' physical and mental health outcomes as well as the working

conditions of healthcare workers, this review intends to deepen the understanding about the role of peppermint aromatherapy in health promotion and disease prevention. The review covers various conditions and patient populations, articulating the use of peppermint aroma in enhancing physical and mental wellbeing, including conditions like nausea, vomiting, fatigue, stress, pain, poor sleep quality, and impaired cognition. Furthermore, the review provides insights into how peppermint aromatherapy can be used as a tool to enhance the alertness, memory, and performance of healthcare workers.



**Effects of Peppermint Aroma on Patients and Medical Staff**

## Methodology

A comprehensive literature search was conducted on the PubMed and Google Scholar databases using a series of keywords and phrases, both independently and in combination. These search terms included: “peppermint,” “peppermint oil,” “peppermint aroma,” “peppermint aromatherapy,” “mental health,” “nausea,” “vomiting,” “fatigue,” “memory,” “stress,” “pain,” “anxiety,” “cognition,” and “performance.” We thoroughly reviewed full manuscripts that examined the implications of peppermint aroma on both physical and mental health. During the evaluation process, particular emphasis was placed on randomized clinical trials when assessing therapeutic indications.

## Beneficial Effects of Mint Aromas on Patients

### Nausea and Vomiting

Several studies have concluded that mint aroma effectively reduces nausea and vomiting during pregnancy [3,4]. A randomized controlled trial by Ghani et al. indicated that a combination of lavender and peppermint essential oils reduced nausea and vomiting in early pregnancy [5], while another one by Safajou

et al. found that combined lemon and peppermint aromatherapy can effectively reduce mild to moderate intensity of nausea and vomiting in pregnant women [6]. Safajou et al also noted that his effect became significant on the second, third, and fourth days of the intervention [6]. Peppermint aromatherapy has also shown potential in managing hyperemesis gravidarum, a condition characterized by excessive nausea and vomiting during pregnancy. A pre-experimental study found that peppermint aromatherapy significantly decreased the severity of these symptoms, promoting better health and nutrition during pregnancy [7]. Thus, peppermint aromas, either alone or in combination with other natural aromas like lavender and lemon could offer a safer, readily available alternative to potentially dangerous medication in conditions like hyperemesis gravidarum that require careful management due to their potential impact on both mother and child (foetus).

Maghami et al. demonstrated the beneficial effects of peppermint essential oil inhalation in reducing postoperative nausea and vomiting in cardiac surgery patients. The peppermint inhalation was administered before the removal of the endotracheal tube, after the operation was completed, and resulted in significant reduction in the frequency, duration, and severity of episodes of

nausea and vomiting within the first four hours post-extubation [8]. Karsten et al. and others have also suggested that peppermint aromatherapy could be a useful adjunct treatment for postoperative nausea and vomiting [9-11]. Even though the results in the Karsten study were not statistically significant, the patients enrolled in the study endorsed the peppermint aromatherapy and reported decreased nausea [9]. Inhaling peppermint aroma was also found to be associated with reduced nausea and vomiting after Caesarean Section surgery [12].

Peppermint aromatherapy offers promise in alleviating the dreadful nausea and vomiting associated with cancer chemotherapy. Eghbali et al. observed that aromatherapy with peppermint essential oil in female patients with breast cancer helped reduce the discomfort caused by chemotherapy-induced nausea and vomiting [13]. Another study conducted in Turkey found that peppermint oil significantly reduced nausea, vomiting, and retching in cancer patients undergoing various chemotherapy treatments. These studies indicate that peppermint oil inhalation, combined with standard antiemetic treatment, could be beneficial in managing chemotherapy-induced nausea and vomiting [14]. Blackburn et al. conducted an aromatherapy study involving patients with acute leukemia undergoing intensive induction chemotherapy [15]. They offered the patients a choice of three scents for the trial: peppermint, lavender or chamomile. The researchers noticed improvements in tiredness, drowsiness, lack of appetite, depression, anxiety, and well-being because of aromatherapy. These results suggest that the peppermint oil aromatherapy method can be implemented to help patients cope with chemotherapy, enhancing patient outcomes.

### **Fatigue and Stress**

Varney and Buckle found that inhaling a mixture of essential oils, including peppermint, had a positive impact on individuals suffering from mental exhaustion or moderate burnout. The study participants reported reductions in perceived stress and improved mood following aromatherapy, demonstrating its potential in the workplace or high-stress environments [16]. Toda and Morimoto exposed study participants to peppermint aroma and observed significant reductions in salivary cortisol levels. Cortisol is often referred to as the “stress hormone,” and its reduction is associated with lowered stress levels. The findings of this study suggest that peppermint aroma could potentially be used as a simple and non-invasive tool for stress relief [17].

Mahdavian et al. in 2021, conducted a study in which cardiac patients were asked to inhale peppermint and lavender essential oils for seven consecutive nights. The aromatherapy regime was well-tolerated and helped improve patients’ overall quality of life by significantly reducing the fatigue associated with their condition [18]. A comprehensive review conducted by Sari, Herawati, and Sunarya in 2023 evaluated the therapeutic benefits

of peppermint aromatherapy in cardiovascular disease patients [19]. Through an exhaustive analysis of literature from several databases, the researchers found that peppermint aromatherapy, recognized for its refreshing aroma, exhibited analgesic, anxiolytic, and sedative properties. This comprehensive range of effects allows it to alleviate symptoms like anxiety, stress, and poor sleep quality, common complaints among cardiovascular disease patients. Therefore, this non-invasive therapeutic approach could be considered by cardiologists to improve their patient’s health outcomes.

## **Hospital In-Patients and Procedures**

### **Reduction of Anxiety During Invasive Procedures**

Akbari et al. in 2019 examined the effects of aromatherapy using peppermint essence on patients undergoing intravenous catheterization. Their findings suggested that the inhalation of peppermint essence could effectively alleviate the pain experienced during the procedure and also reduce associated anxiety levels, offering an accessible, non-invasive method to improve patient comfort during such procedures [20].

In 2022, a clinical trial conducted by Soleimani et al. studied the effects of peppermint aromatherapy on anxiety in acute coronary syndrome patients in the emergency department [21]. After the intervention, the group that inhaled peppermint essential oil displayed a significant anxiety reduction. This finding indicates that peppermint essential oil inhalation can significantly alleviate anxiety in patients with acute coronary syndrome.

A previous clinical trial in 2017, conducted by Mogharab, Ayoubzadeh, and Sharif-Zadeh, assessed the effect of peppermint aromatherapy on anxiety levels in patients undergoing colonoscopy [22]. The intervention group inhaled peppermint essential oil before the procedure, and this group exhibited a significant decrease in anxiety scores. These studies suggest that peppermint aromatherapy can be an effective method for reducing anxiety in patients about to undergo invasive procedures, such as endoscopy, coronary angiography and central venous line placement.

### **Improvement of Sleep Quality**

Hamzeh et al. carried out a study in 2020 investigating the impact of aromatherapy using lavender and peppermint essential oils on the sleep quality of cancer patients [23]. 120 patients were divided randomly into three groups: lavender, peppermint, and control. Both the lavender and peppermint groups demonstrated a significant improvement in sleep quality after the intervention. This research suggests that aromatherapy with lavender and peppermint essential oils can potentially enhance sleep quality in cancer patients. In a similar study, Blackburn demonstrated that aromatherapy, including peppermint, improved sleep quality and

reduced various symptoms such as tiredness, lack of appetite, depression, and anxiety in patients. His results suggested that aromatherapy could serve as a complementary therapy for patients undergoing intensive chemotherapy, offering the potential to improve patient comfort and overall treatment experience [15].

### **Pain**

A study by Baraka and Hassan in 2022 demonstrated the analgesic benefits of peppermint inhalation in mechanically ventilated patients [24]. This randomized placebo-controlled trial found that pain scores were significantly reduced in patients who inhaled peppermint compared to those who inhaled almond (the placebo). Interestingly, the patient's ability to smell was positively correlated with pain reduction, suggesting that individual sensory capabilities might influence the effectiveness of such interventions. Another study found that the application of peppermint essential oil via warm compresses could reduce menstrual pain. The peppermint oil is believed to work by promoting vasodilation and reducing pain signals, which in turn improves blood circulation and provides pain relief. This offers a potential natural alternative for managing menstrual discomfort [25].

### **Other Medical Conditions**

Kim et al. (2005) performed a study on elderly patients suffering from constipation. An aromatherapy massage using a blend of essential oils (rosemary, lemon, and peppermint) was found to significantly alleviate constipation in the study subjects. This approach offers an integrative, holistic means of addressing a common issue among the elderly [26].

Semiring et al. studied the use of topical peppermint aromatherapy in reducing uremic pruritus, a common and bothersome symptom among chronic renal failure patients. Their findings confirmed that peppermint aromatherapy was effective in reducing itchiness, potentially improving the quality of life for these patients [27].

### **Mild Cognitive Impairment**

Peppermint aroma has shown good effects on learning and memory disorders by protecting neurons and preventing oxidative damage. Research suggests that sniffing mint compound essential oil can reduce the content of serum AchE (acetylcholine esterase) and facilitate cognitive function in patients with mild cognitive impairment [28].

## **Advantages Offered by Mint Aroma for Healthcare Workers**

### **Promoting Alertness and Memory**

A study by Mahachandra and Garnaby in 2015 aimed to explore the effectiveness of peppermint fragrance as a car

freshener in maintaining alertness levels in drivers [29]. Their findings showed that peppermint fragrance improved the drivers' alertness, suggesting its application as an in-vehicle fragrance. A 2008 study by Moss et al., sought to examine the effects of peppermint and ylang-ylang aromas on cognition and mood in healthy individuals [30]. A group of 144 volunteers was randomly divided into three groups: those exposed to peppermint aroma, those exposed to ylang-ylang aroma, and those with no exposure to any aroma (control). Cognitive performance was evaluated using a computerized battery of tests and mood scales were employed before and after the examination. The study uncovered that peppermint significantly boosted memory and alertness levels. These demonstrated effects on alertness, memory and cognition, if applied in nursing and health-care workers, can prove highly beneficial for patient care.

### **Enhances Accuracy and Performance**

A noteworthy semi-experimental study conducted by Ghods and Valian in 2013 focused on the potential impact of peppermint aroma on the accuracy level of nurses in intensive care units (ICUs) [31]. The high-stress environment in ICUs can sometimes affect the accuracy of the healthcare professionals working there, with serious implications for patient outcomes. In the findings, critical care nurses showed statistically significant improvement in accuracy in the group that received the peppermint essence. This suggests that peppermint aroma may be a viable option to enhance accuracy and performance in high-stress, critical care environments such as ICUs and high dependency areas.

## **Discussion**

Aromas and pleasing scents have been utilized by humans ever since the advent of civilization. Apart from their cosmetic utility, perfumed substances have also been known to have therapeutic qualities. In the Holy Bible is the verse: "But I have received everything in full and have an abundance; I am amply supplied, having received from Epaphroditus what you have sent, a fragrant aroma, an acceptable sacrifice, well-pleasing to God." (Philippians 4:18) [32]. In the Mahamrityunjaya Mantra, famed for its death-defying attributes, there are the words: "Sugandhim pushti vardhanam", which can be interpreted as "Fragrance enhances health" [33]. This is a direct reference to the health-promoting qualities of perfumed substances.

Aromatherapy itself is one of the branches of alternative and complementary therapies, and has been practiced systematically for over five decades now. The aromas act via stimulating the olfactory receptors in the nose, and the impulses are carried to the brain through the olfactory nerves. Besides this, the aroma compounds can also reach the frontal regions of the brain directly through the lymphatic channels running alongside the nerve fibrils of the olfactory nerve, between the olfactory mucosa and



the meninges covering the brain [34]. These lymphatic microvessels reach the brain through the perforations in the cribriform plate. This route allows for almost instantaneous effects to occur, whenever any odour is encountered by the individual.

From the studies mentioned in the text above, it is clear that peppermint aroma can prove very useful in health care facilities, especially in relieving stress and improving mood. The importance of these studies extends beyond nursing practice, offering insights into how aromatherapy might be used to enhance accuracy and performance in other professional settings as well. Mint candies and gums are already popular, and may be utilized in patients allowed oral intake. Health care workers, including nurses, technicians, physiotherapists and supporting staff may also benefit from such mouth fresheners when under increased stress. ICU environments may be aromatised using vaporizers or aerosols, for short periods to relax the tense atmosphere. Floor sanitizers such as phenyl, used for sweeping, are usually perfumed, and peppermint odour may be incorporated in these. Other useful odours may similarly be considered for use in hospital environments.

## Conclusion

The comprehensive literature survey undertaken in present review reveals the multi-faceted therapeutic potential of peppermint essential oil, demonstrated through numerous research studies. Peppermint aroma has shown significant benefits in reducing symptoms such as nausea, vomiting, anxiety, and improving sleep quality in diverse health contexts. Its stimulating effect also aids healthcare workers, enhancing their alertness, memory, and performance in high-stress environments. However, further research is necessary to understand its precise mechanism of action and to standardize dosage and administration for optimal results. The growing evidence supporting its therapeutic benefits indicate the importance of integrating such non-invasive, holistic treatments like peppermint aromatherapy into mainstream healthcare practices. In doing so, not only patient care and comfort will be advanced, but also, more conducive environments can be created for healthcare professionals.

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