



Evaluation of Aromatherapy in the Management of Generalized Anxiety Disorder Symptoms

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Abstract

Anxiety is the most common psychiatric disorder in individuals across the world. It affects everyone differently in terms of symptoms and severity, but the focal points are characterized by an excessive feeling of worry or impending doom. Anxiety can be managed pharmacologically with selective serotonin reuptake inhibitors (SSRIs) and serotonin norepinephrine reuptake inhibitors (SNRIs). There are non-pharmacologic practices, however, that people can utilize that date back to the Ancient Egyptians. However, there are non-pharmacologic practices dating back to the Ancient Egyptians that people can also utilize. Aromatherapy is a holistic medicine practice that utilizes scents to stimulate sensations for the management of certain conditions. There are many essential oils on the market for the management of anxiety. This article will discuss anxiety, pharmacologic therapies for anxiety, holistic medicine, and the uses and benefits of aromatherapy on anxiety symptoms.





Introduction

What is Anxiety?

Anxiety is a natural response and normal part of the human brain, where a person may occasionally experience disruptions in daily life. It is an adaptive response that allows for perception of a stressful event. However, anxiety disorders are psychiatric conditions that involve extreme fear or worry.¹ Simply put, it is due to an overactive fear response. This differs from normal feelings of anxiety in a way where constant anxiety becomes debilitating, persistent psychological and physical symptoms.¹ It affects the person's ability to function by making it difficult for the person to get out of bed, go to school, or function in society.¹ Situation anxiety is more severe, but temporary. These last no more than 2-3 weeks at a time. When an anxiety disorder becomes long-term, it starts to affect other health aspects and can evolve into cardiovascular, cerebrovascular, GI, and respiratory disorders.¹ There are several forms of anxiety, including generalized anxiety disorder, panic disorder, agoraphobia, social anxiety disorder, obsessive compulsive disorder, specific phobias, selective mutism, and more. These disorders can be hereditary, but can sometimes develop through other factors ranging from gender, brain chemistry, personality, life events, and more.¹

Anxiety disorders are one of the most common mental disorders in the United States. The US national prevalence data shows that nearly 40 million people (roughly 18%) experience anxiety

disorders.² Around 8% of children and adolescents experience anxiety symptoms before the age of 21.² Despite the disorders being treatable, only one third of those experiencing anxiety disorders actually receive treatment.^{1,2}

There are several risk factors involved with anxiety disorders. First, females have a higher chance of developing an anxiety disorder compared to men.^{2,3} There is a 2:1 female to male ratio for anxiety disorders. This disorder is most commonly seen in the young adult to middle-aged group (21-45 years of age).^{2,3} The most common psychiatric comorbidity seen with anxiety is depression.^{1,2} A patient who presents with anxiety disorders may be diagnosed with depression as well. When coupled with other ongoing issues such as social issues, financial problems, medical illnesses, family history of anxiety and depression, and lack of support from families or friends, this may increase the risk factors for an individual developing an anxiety disorder.³ Like chronic comorbid conditions, such as diabetes or allergies that are passed through familial generations, anxiety is the same way.² Medical illnesses may arise from anxiety disorders and these may lead to cardiovascular, neurologic, endocrine, metabolic, gastrointestinal, and other illnesses.⁴

Generalized anxiety disorder (GAD) is a common mental health anxiety disorder that leads to excessive, uncontrolled worry in an individual that interferes with the normal everyday functioning.^{2,3} GAD occurs for at least 6 months and causes significant





distress and impairment in social, occupational, or other important areas of function.⁵ The individual may have uncontrolled worry about different events with heightened tension. This can range from pure GAD, where the individual has no comorbidities, or typical GAD, where the individual usually presents with other comorbid conditions in addition to GAD. The presentation of GAD can vary amongst patients, but generally involves difficulty concentrating, restlessness, fatigue, muscle tension, sleep disturbances, and/or irritability.⁵

In fear of a threat, the locus ceruleus acts as an alarm and activates the release of norepinephrine.⁴ Since norepinephrine stimulates sympathetic nervous system responses, an anxious person will experience increased heart rate, panic, and increased blood pressure. Additionally, excessive norepinephrine causes an increase in glutamate release, an excitatory neurotransmitter that causes further sympathetic responses.⁴ The increased levels of circulating glutamate results in more feelings of panic and anxiety. Therefore, the flight-or-fight response becomes continuously activated.⁴

In order to develop an effective plan for management of anxiety, several factors must be considered. These factors include severity, chronicity of symptoms, age, medication history, comorbidities, history of prior family response, patient preferences, cost, and the goal of anticipated effects. The anxiety goals of therapy are to reduce the severity and duration of anxiety symptoms,

improve day-to-day functions, induce remission, prevent functional impairment, and improve quality of life.⁴ As such, anxiety symptoms could be managed either by non-pharmacological treatments and/or pharmacological treatments.⁴

First-Line Therapies in Anxiety Management **Pharmacological Interventions**

The treatment for each type of anxiety may differ slightly in terms of first-line of treatment. However, the treatments generally consist of either antidepressants, benzodiazepines, or buspirone. Alternative medications may be used for breakthrough anxiety.

There are two main groups of antidepressants: selective serotonin reuptake inhibitors (SSRIs) and serotonin-norepinephrine reuptake inhibitors (SNRIs).⁴ The first-line for long-term management of anxiety disorders include either SSRIs or SNRIs depending on the patient.⁴ Antidepressants reduce psychic symptoms compared to other classes for anxiety, but could take at least four weeks, or longer, for patients to see the full effect.⁴ Psychic symptoms include apprehension, worry, hallucinations, and more.^{4,6} SSRIs can have different adverse reactions that either do or do not subside with time. Some examples of adverse reactions that do not typically subside with SSRIs include sexual dysfunction and anticholinergic symptoms (drowsiness, dry eyes/mouth, constipation, etc).^{4,6}





With these medications used to treat anxiety, patients can develop withdrawal upon discontinuation.⁴ In addition, patients might experience undesirable side effects from these medications that, while helping the condition, could lead to additional emotional or physical problems.⁶ For these reasons, some patients may want to look for a more natural approach to managing their anxiety symptoms. Patients may also want to choose to incorporate natural therapies into their regimen to complement current pharmacologic or non-pharmacologic therapies.

Non-Pharmacologic Interventions: Cognitive Behavior Therapy

Today, most non-pharmacological therapies for managing anxiety are centered on cognitive behavior therapy.^{4,7} During this therapy, many relaxation techniques are used and taught to the patient for them to utilize when experiencing anxiety symptoms. With generalized anxiety disorder, patients experience feelings of excessive worry or impending doom. As a result, the individual has decreased problem solving abilities, attention disturbances, and decreased ability to effectively manage stressful or negative situations.⁷ The overall goal of this therapy is to replace worrisome thoughts and provide the patients with coping strategies and techniques. A study conducted by Gould et al. determined that cognitive behavior therapy and pharmacologic interventions are equally effective in the management of generalized anxiety disorder.⁸ Other nonpharmacologic treatments are available to patients with generalized anxiety disorder, including

music therapy, meditation, and aromatherapy, which will be discussed in this article.

Essential Oils and Aromatherapy History

Essential oils were founded by the ancient Egyptians around 3500 BC through the cultivation of plants for medicinal and religious practices.⁹ The popularity of essential oils expanded throughout Asia and Europe, and became an integral component of Indian Ayurvedic medicine and many holistic therapies practiced by the Greeks.⁹ Holistic medicine is defined as a whole-body approach to health care and is a combination of traditional medicine and complementary/alternative medicine (CAM).⁹ This practice focuses on the link between physical health and the overall well-being of an individual in the prevention and treatment of disease. It takes into account the psychological, emotional, social, spiritual, and environmental states of an individual to gain a clear picture of the patient.⁹ Problems arise when one or more of these components are out of balance. As a result, the holistic approach helps bring equilibrium to these unbalanced components.⁹ Holistic medicine is practiced by many people and is an integral component of different cultures.⁹

While essential oils were popular and used since 3500 BC, the term “aromatherapy” was not coined until the year 1937 after a French chemist and perfumer, Rene Maurice Gattefosse, severely burned his hand.⁹ He did not have any medications to treat this injury and





decided to treat the wound with pure, undiluted lavender oil. After doing so, the chemist claimed the pain immediately subsided and promoted healing with no evidence of infection or scarring.⁹ This led to him conducting more experiments on the uses and effects of essential oils from nature when treating patients.⁹ Aromatherapy has continued to evolve in both understanding and popularity since the early 1980s as more people have become interested in natural medicine and environmental concerns.⁹ Today, many people utilize these essential oils.

Postulated Mechanisms of Aromatherapy

Aromatherapy works through the sense of smell and skin absorption of essential oils to stimulate certain sensations.¹⁰ Several products can be used for aromatherapy, such as diffusers, inhalers, bathing salts, and topical applications (creams, diluted oils through roller-bottles, etc).¹⁰ Essential oils have been used for symptom management of different conditions, such as asthma, insomnia, anxiety, depression, pain, inflammation, arthritis, or endocrine system conditions (erectile dysfunction, menstrual pain, or menopause) to name a few.¹⁰ In addition to being used in different conditions, there are many essential oils available on the market.

Particular smells associated with some essential oils help reduce anxiety in individuals.¹¹ However, this is still an unclear mechanism and is still a hypothesis, therefore, more research needs to be completed on this.

Aromatherapy Agents, Uses, and Delivery

The following list details the different essential oils and their potential effects:¹²

- Valerian: May help promote sleep and calms the nerves by eliciting a mildly sedating effect.¹²
- Jatamansi: Utilized in Ayurvedic medicine to help calm the mind and encourage sleep. Some studies have also shown that it may relieve symptoms of depression by decreasing the number of GABA (inhibitory) neurotransmitters and monoamine oxidase receptors in the brain.¹²
- Lavender: The most popular essential oil for anxiety symptoms. The mechanism behind the effect is unclear, but is thought to have an impact on the limbic system (the memory and emotion complex of the brain).¹²
- Jasmine: Inhalation may promote a general sense of well-being without causing sleepiness.¹²
- Holy basil (Tulsi): Has a spicy, mint aroma due to the presence of eugenol, which may help treat physical and mental stress.¹²
- Sweet basil: Contains phenol compounds that are thought to calm the mind and relieve stress. It has been shown to be less sedating than diazepam, a common medication in the treatment of anxiety.¹²
- Bergamot: May help improve mood and anxiety symptoms.¹²
- Chamomile: May contain relaxing and sedating properties. There is not much understanding behind the





effects of inhaling the scent, but it has shown promising benefits in mild-moderate general anxiety disorder when taken orally.¹²

- Rose: May help relax the senses in pregnant patients during labor when administered via a footbath.¹²
- Vetiver: May promote relaxation.¹²
- Ylang ylang: May promote relaxation.¹²
- Frankincense: May ease anxiety symptoms.¹²
- Clary sage: May ease tension and help control cortisol levels in women.¹²
- Patchouli: May relieve symptoms of anxiety, depression and stress.¹²
- Geranium: May help decrease diastolic blood pressure and anxiety symptoms in pregnant patients during labor.¹²
- Lemon balm: May help relieve symptoms of mild-moderate generalized anxiety disorder and promotes sleep when taken via capsules.¹²
- Marjoram: May help ease headaches.¹²
- Fennel: May help relieve anxiety symptoms related to menopause.¹²

In addition to using these oils as single agents, they may also be combined with other oils to elicit multiple effects or more symptom management.¹² For example, the combination of ylang ylang with lavender and bergamot may help to lower stress levels by decreasing blood pressure, heart rate, and serum cortisol levels (the main hormone that contributes to stress).¹²

The delivery of these agents mentioned above include inhalation, oral, and injections.¹³ These different delivery actions produce similar effects on the brain, where 5-HT and dopamine (DA) are affected.¹⁴ In numerous studies that used rose oil, a physiological and psychological relaxation and anxiolytic effect was seen in primigravida women.¹⁵ Another study reported that rose geranium oil produced an anxiolytic effect in mice after an acute intraperitoneal injection.¹⁶

Studies Evaluating the Effectiveness of Aromatherapy

The placebo effect is a common rationale given for the mechanism of essential oils. A study by Ahmad et al evaluated the use of relaxation promoting essential oils, namely lavender, in pharmacy students via a randomized-single-blind placebo controlled trial. The students that were enrolled in the study were male and did not have a previous diagnosis of anxiety or depression, but were to undergo aromatherapy twice daily for three weeks during final exams. The researchers concluded that there was no benefit from aromatherapy when compared to placebo.¹⁷

Although the ratio for anxiety diagnosis is twice as many in females compared to males, there is still a greater bias towards using male subjects when looking at anxiolytic drug therapies.^{2,3} Only a few studies looked at both sexes when comparing the medications. Differences in male and female physiology is apparent especially in steroid hormones. Hormones affect anxiety greatly, as sex hormones are





one of the main causes between anxiety differences in male and female. Studies show that high levels of estrogen reduce anxiety levels in female rodents.¹⁸ Additionally, human males and females differ greatly in their olfactory bulb. This difference in the olfactory molecules and receptors results in dissimilarities between the male and female response.^{18,19} As a result of both sexes displaying different responses to essential oils, it may be more beneficial if future studies looked at both sexes in order to determine a more comprehensive mechanism of action.

In a Portuguese study, there were 50 subjects enrolled to receive 6 different types of aromatherapy massages.²⁰ There was a statistically significant found ($p < 0.001$) reduction in heart and respiratory rates. However, due to being an uncontrolled and small study, it may be underpowered.²⁰ In the study, 39/50 were female and the average age was 30 and 35 years of age, men and women respectively.²⁰ Medications and tobacco use were not excluded so it may have played a part in their anxiety reduction.²⁰ In order to reduce this potential bias, the researchers tried to take this consideration into account by timing their aromatherapy massages.²⁰ In the discussion, the researchers addressed that some of the limitations of the study may stem from the lack of standardized concentrations and formulations of essential oils. There was also a lack of sample calculations, control group, and large sample size. Despite showing benefit in aromatherapy use, more studies would need to be conducted in order to show benefit from use.²⁰

Discussion

Based on the following methods and treatments available, it may benefit individuals suffering from anxiety to try more natural products when evaluating the side effect profiles of traditional pharmacologic therapies, cost of both pharmacologic and non-pharmacologic therapies, convenience-of-use, and time.

With aromatherapy, patients may experience a quick response to ease anxiety symptoms. Aromatherapy can be delivered via different methods that an individual can keep on themselves (bracelets, necklaces, roll-bottles, inhalation sticks, etc) or stationed throughout their place of residence (diffusers, candles, etc).

There is limited data and research available on aromatherapy benefits or effectiveness, so it should not replace pharmacologic medications. When completing a MeSH search in PubMed, there was limited data and research conducted on aromatherapy. When using search words “aromatherapy AND anxiety,” only 9 results appeared between 2012 and 2021. For this reason, there were not major conclusive studies showing benefits for aromatherapy use in anxiety. In certain cases, some individuals may benefit from essential oil alone. In others, however, there may be limited to no benefit of using essential oils. This does not disregard the use of essential oils completely. Regardless, if essential oils work well for one person, this may not be the case for everyone. If a person experiencing anxiety prefers to take a more natural approach to anxiety





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management, aromatherapy is a possible option, but the individual should always consult with their physician regarding its use.

In conclusion, more studies should be conducted to evaluate the effectiveness, safety, and mechanism of action of aromatherapy on patients with psychiatric conditions, such as anxiety and depression.





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