

**ANXIETY AND AROMATHERAPY- A REVIEW****SARAH SATHIYAWATHIE^{*1}, DHANRAJ GANAPATHY² AND ANITHA ROY³**^{1,2}*Department of Prosthodontics, Saveetha Dental College, Chennai, India.*³*Department of Pharmacology, Saveetha Dental College, Chennai, India.***ABSTRACT**

Aromatherapy is currently used worldwide in the management of chronic pain, depression, anxiety, some cognitive disorders, insomnia and stress-related disorders. Although essential Oils have been used, reputedly, effectively, for centuries as a traditional medicine; there is very little verified science behind this use. The pharmacology of the essential oils and/or their single chemical constituents, therefore, remains largely undiscovered. However, accumulating evidence that inhaled or dermally applied essential oils enter the blood stream and, in relevant molecular, cellular or animal models, exert measurable psychological effects, indicates that the effects are primarily pharmacological. Studies with brain wave frequency have shown that smelling lavender increases alpha waves in the back of the head, which are associated with relaxation. Fragrance of Jasmine increases beta waves in the front of the head, which are associated with a more alert state. Scientific studies have also shown that essential oils contain chemical components that can exert specific effects on the mind and body. The definition of aromatherapy as well as the uses of aromatherapy is discussed in this review.

KEYWORDS: Anxiety, Aromatherapy, Essential oils, Orange oil, Lavender oil, Sandalwood oil.**SARAH SATHIYAWATHIE**

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INTRODUCTION

Anxiety is an unpleasant mental state that is elicited in anticipation of a threat or potential threat, often complained of nervous behaviour, such as pacing back and forth, somatic complaints and rumination.¹³ It is the subjectively unpleasant feelings of dread over something unlikely to happen, such as the feeling of imminent death.² Anxiety is not the same as fear, which is felt about something realistically intimidating or dangerous and is an appropriate response to a perceived threat.⁴ When anxiety becomes overwhelming and distressing to the sufferer, it may fall under the psychiatric diagnosis of anxiety disorder.⁵ Everyone feels anxious from time to time. Stressful situations such as meeting tight deadlines or important social obligations often make us nervous or fearful. Experiencing mild anxiety may help a person become more alert and focused on facing challenging or threatening circumstances. But individuals who experience extreme fear and worry that does not subside may be suffering from an anxiety disorder. The frequency and intensity of anxiety can be overwhelming and interfere with daily functioning. Fortunately, the majority of people with an anxiety disorder improve considerably by getting effective psychological treatment.⁶ Anxiety can be a symptom of an underlying health issue such as chronic obstructive pulmonary disease (COPD), heart failure, or heart arrhythmia.⁷ Abnormal and pathological anxiety or fear may itself be a medical condition falling under the blanket term "anxiety disorder". Such conditions came under the aegis of psychiatry at the end of the 19th century⁸ and current psychiatric diagnostic criteria recognise several specific forms of the disorder.⁹ Anxiety is common in adults and is more common in females rather than males. Women had generally higher prevalence rates across all anxiety disorder categories, compared with men, but the magnitude of this difference varied.¹⁰

SIGNS AND SYMPTOMS

The physical effects of anxiety may include palpitations, tachycardia, muscle weakness and tension, fatigue, nausea, chest pain, shortness of breath, headache, stomach aches, or tension headaches.¹¹ As the body prepares to deal with a threat, blood pressure, heart rate, perspiration, blood flow to the major muscle groups are increased, while immune and digestive functions are inhibited (the fight or flight response).¹² External signs of anxiety may include pallor, sweating, trembling, and pupillary dilation. For someone who suffers from anxiety this can lead to a panic attack. Sir Aubrey Lewis even suggests that "anxiety" could be defined as agony, dread, terror, or even apprehension.¹³

AROMATHERAPY

Aromatherapy means "treatment using scents". It is a holistic treatment of caring for the body with pleasant smelling botanical oils such as rose, lemon, lavender and peppermint. The essential oils are added to the bath or massaged into the skin, inhaled directly or diffused to scent an entire room. Aromatherapy is used for the relief of pain, care for the skin, alleviate tension and fatigue and invigorate the entire body. Essential oils can affect

the mood, alleviate fatigue, reduce anxiety and promote relaxation. When inhaled, they work on the brain and nervous system through stimulation of the olfactory nerves.¹⁴ The essential oils are aromatic essences extracted from plants, flowers, trees, fruits, bark, grasses and seeds with distinctive therapeutic, psychological, and physiological properties, which improve and prevent illness. There are about 150 essential oils. Most of these oils have antiseptic properties; some are antiviral, anti-inflammatory, pain-relieving, antidepressant and expectorant. Other properties of the essential oils which are taken advantage of in aromatherapy are their stimulation, relaxation, digestion improvement, and diuretic properties. To get the maximum benefit from essential oils, it should be made from natural, pure raw materials. Synthetically made oils do not work.¹⁵ Aromatherapy is one of the fastest growing fields in alternative medicine. It is widely used at home, clinics and hospitals for a variety of applications such as pain relief for women in labour pain, relieving pain caused by the side effects of the chemotherapy undergone by the cancer patients, to treat infections, and rehabilitation of cardiac patients. Aromatherapy is already slowly getting into the mainstream. In Japan, engineers are incorporating aroma systems into new buildings. In one such application, the scent of lavender and rosemary is pumped into the customer area to calm down the waiting customers, while the perfumes from lemon and eucalyptus are used in the bank teller counters to keep the staff alert.¹⁵ Essential oils stimulate the powerful sense of smell. It is known that odours we smell have a significant impact on how we feel. In dealing with patients who have lost the sense of smell, doctors have found that a life without fragrance can lead to high incidence of psychiatric problems such as anxiety and depression. We have the capability to distinguish 10,000 different smells.¹⁶ It is believed when we inhale a scent, the chemical components within it travel via the nostrils to the olfactory bulb and then to the limbic part of the brain. This is an inner complex ring of structures below the cerebral cortex that are arranged into 53 regions and 35 associated tracts, including the amygdala and the hippocampus. The amygdala governs our emotional response to an aroma. The memory and recognition of smell takes place in the hippocampus. The hippocampus is also where chemicals in an aroma trigger our unique repository of learning memories.¹⁷

ESSENTIAL OILS

An essential oil is a concentrated, hydrophobic liquid containing volatile aroma compounds from plants. Essential oils are also known as volatile oils, ethereal oils, or aetherolea, or simply as the "oil of" the plant from which they were extracted, such as oil of clove. Oil is "essential" in the sense that it carries a distinctive scent, or essence, of the plant. Essential oils do not form a distinctive category for any medical, pharmacological, or culinary purpose. Essential oils are lipotropic, which means they are fat-soluble. The principal barrier to topical drug therapy is the keratin-rich cells in the stratum corneum. However, these cells are embedded in multiple lipid bilayers. Recent research has shown that essential oils increase drug permeation, thus indicating that essential oils are themselves absorbed.¹⁸ Their chemistry is complex, but generally includes

alcohols, esters, ketones, aldehydes, and terpenes.¹⁹Essential oils are generally extracted by distillation, often by using steam. Other processes include expression or solvent extraction. They are used in perfumes, cosmetics, soaps and other products, for flavoring food and drink, and for adding scents to incense and household cleaning products. Essential oils have been used medicinally in history. Medical applications proposed by those who sell medicinal oils range from skin treatments to remedies for cancer and

often are based solely on historical accounts of the use of essential oils for these purposes. Claims for the efficacy of medical treatments, and treatment of cancers in particular, are now subject to regulation in most countries.¹⁵Some commonly used species are scents of vanilla, orange blossom, rose, chamomile and lavender have a noticeable calming effect. Scents of lavender, sandalwood and nutmeg help you shrug off the ill-effects of stress.¹⁴

CHAMOMILE



Figure1
***Chamaemelum Nobile* flowers**

Chamaemelum Nobile, belong belong to the family *Asteraceae*. The word chamomile is also known as "earth apple". Major chemical compounds present in chamomile include apigenin and alpha-bisabolol.²⁰ Other classes of chemicals include sesquiterpenes, terpenoids, flavonoids, coumarins such as herniarin and umbelliferone, phenylpropanoids such as chlorogenic acid and caffeic acid, flavones such as apigenin and luteolin, flavanols such as quercetin and rutin, and polyacetylenes.¹⁹Apigenin has demonstrated strong chemopreventive effects²¹ while alpha-bisabolol has been shown to have antiseptic properties, anti-inflammatory properties, and has also been demonstrated to reduce pepsin secretion without altering secretion of stomach acid.²² Chemical compounds present within chamomile have demonstrated the ability to bind GABA receptors, modulate monoamine neurotransmission, and have

displayed neuroendocrine effects.²³Umbelliferone has been shown to be fungistatic. Coumarin compounds present in chamomile such as herniarin and umbelliferone may have blood-thinning properties, and there is some evidence that chamomile may interact with other medications causing drug-drug interactions.²⁴Chamomile has been used for inflammation associated with hemorrhoids when applied topically. Chamomile also possesses anxiolytic (anti-anxiety) properties and may have clinical applications in the treatment of stress and insomnia. Chemical components of chamomile extract have demonstrated anti-inflammatory, antihyperglycemic, antigenotoxic, and anticancer properties when examined in vitro and in animal studies.^{25,26}Chamomile is frequently added to skin cosmetics to serve as an emollient, and for its anti-inflammatory effects. Chamomile is also often used to enhance the colour of blonde hair.²⁷

LAVENDER OIL



Figure 2
***Lavandula angustifolia* flowers**

Lavandula angustifolia or Lavandula (Lavender) is flowering plants in the mint family, *Lamiaceae*. Lavender colour of the flowers of this species named for the shade.²⁸ The primary components of lavender oil are linalool and linalyl acetate.²⁹ Other components include α -pinene, limonene, 1, 8-cineole, cis- and trans-ocimene, 3-octanone, camphor, caryophyllene, terpinen-4-ol and lavendulyl acetate. Lavender is used extensively with herbs and aromatherapy. Infusions are believed to soothe insect bites, burns, and headaches. Bunches of lavender repel insects. In pillows, lavender seeds and flowers aid sleep and relaxation.³⁰ An infusion of flower heads added to a cup of boiling water is used to soothe and relax at bedtime. Lavender oil (or extract of Lavender) is used to treat acne when diluted 1:10 with water, rosewater, or witch hazel; it also treats skin burns and inflammatory conditions. Lavender oil, which has long been used in the production of perfume, can also be used in aromatherapy. The scent has a calming effect which may aid in relaxation and the reduction of

anxiety³¹ and stress.³² Lasea capsules containing lavender oil with a high amount of linalool and linalyl acetate, termed Silexan by the manufacturer, are approved as an anxiolytic in Germany.³³ The approval is based on a finding that the capsules are comparable in effect to low-dose lorazepam.³⁴ It may also help to relieve pain from tension headache when breathed in as vapor or diluted and rubbed on the skin. When added to a vaporizer, lavender oil may aid in the treatment of cough and respiratory infection. A recent clinical study investigated anxiolytic effects and influence on sleep quality. Lavender oil with a high percentage of linalool and linalyl acetate, in the form of capsules, was generally well tolerated. It showed meaningful efficacy in alleviating anxiety and related sleep disturbances.³⁵ Lavender may be very effective with wounds; however, Lavender Honey (created from bees feeding on lavender plants), instead of lavender essential oil has the best effects of uninfected wounds.³⁶

ROSE OIL



Figure 3
Rosa damascene flowers

Rose essential oil is extracted from the damask rose - *Rosa damascena* of the *Rosaceae* family and is also known as Bulgarian and Turkish rose, otto of rose and attar of rose.³⁶ The most common chemical compounds present in rose oil are: citronellol, geraniol, nerol, linalool, phenyl ethyl alcohol, farnesol, stearoptene, α -pinene, β -pinene, α -terpinene, limonene, p-cymene, camphene, β -caryophyllene, neral, citronellyl acetate, geranyl acetate, neryl acetate, eugenol, methyl eugenol, rose oxide, α -damascenone, β -damascenone, benzaldehyde, benzyl alcohol, rhodinyl acetate and phenyl ethyl formate.³⁷ The

key flavour compounds that contribute to the distinctive scent of rose oil, however, are beta-damascenone, beta-damascone, beta-ionone, and rose oxide. Beta-damascenone presence and quantity is considered as the marker for the quality of rose oil. Even though these compounds exist in less than 1% quantity of rose oil, they make up for slightly more than 90% of the odour content due to their low odour detection thresholds.³⁸ Depression, eczema, frigidity, mature skin, menopause, and stress.³⁹

ORANGE OIL

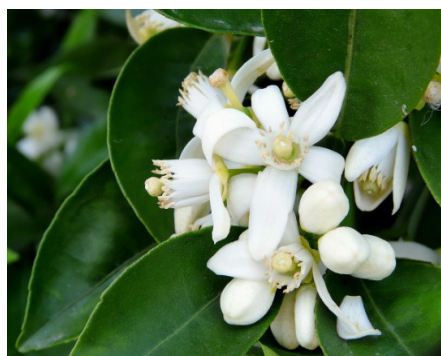


Figure 4
Citrus sinensis flower

Orange oil is extracted from *Citrus sinensis* (*Citrus aurantium* var. *dulcis* and *C. aurantium* var. *sinensis*) of the *Rutaceae* family and is also known as Portugal or China orange.⁴⁰ It is extracted as a by-product of orange juice production by centrifugation; producing cold-pressed oil. It is composed of mostly d-limonene⁴¹ and is often used in place of pure d-limonene. D-limonene can be extracted from the oil by distillation. Limonene gives citrus fruit their familiar aroma, and is therefore used in perfume and household cleaners for its fragrance. It is also an effective, environmentally friendly, and relatively safe solvent, which makes it an active ingredient of choice in many applications, such as, but not limited to, adhesive and stain removers, cleaners of various sorts, and strippers. The therapeutic

properties of orange oil are antiseptic, anti-depressant, antispasmodic, anti-inflammatory, carminative, diuretic, cholagogue, sedative and tonic. It is sunny and radiant oil, bringing happiness and warmth to the mind and helps people to relaxant helps children to sleep at night. Orange oil can be used effectively on the immune system, as well as for colds and flu and to eliminate toxins from the body. It is a good diuretic and is most useful in balancing water retention and obesity. Its lymphatic stimulant action further helps to balance water processes, detoxification, aiding the immune system and general well-being. For the digestive system, orange oil can help with constipation, dyspepsia and as a general tonic. It is also useful to treat infections, nervous tension and stress.⁴²

SANDALWOOD OIL



Figure 5
Santalum album

Sandalwood oil is an essential oil obtained from the steam distillation of chips and billets cut from the heartwood of the sandalwood (*Santalum album*) tree.⁴³ They belong to the *Santalaceae* family. Sandalwood oil contains more than 90% a sesquiterpenic alcohol of which 50-60% is the tricyclic α -santalol. β -Santalol comprises 20-25%.⁴⁴ Sandalwood essential oil is used in Ayurvedic medicine for the treatment of both somatic and mental disorders.⁴⁵ A study investigating the effects of inhalation of East Indian sandalwood oil and its main compound, α -santalol, on human physiological parameters found that the compounds elevated pulse rate, skin conductance, and systolic blood pressure. Sandalwood oil and α -santalol have been associated with chemopreventive activity in animal models of carcinogenesis.⁴⁶ Beta-santalol (~90%) has antimicrobial properties. It is used in aromatherapy and to prepare soaps. Due to this antimicrobial activity, it can be used to clear skin from blackheads and spots, but it must always be properly diluted with carrier oil. Because of its strength, sandalwood oil should never be applied to the skin without being diluted in carrier oil.⁴⁷

CONCLUSION

This review supports the opinion that odours are capable of altering emotional states and may indicate that the use of odours is helpful in reducing anxiety. Another study showed that lavender aromatherapy has the potential to ease anxiety in patients undergoing minimally invasive facial cosmetic procedures. In Japan in a 2007 study, researchers demonstrated that smelling lavender and rosemary oils for five minutes decreased cortisol levels. Free radicals/reactive oxygen species are related to many biological phenomena such as inflammation, aging, and carcinogenesis. Free radical scavenging activity (FRSA) is a protective mechanism that can be measured in saliva. The results of this study shed light on the fact that lavender and rosemary enhance FRSA and decrease the stress hormone, cortisol, which protects the body from oxidative stress.

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CONFLICT OF INTEREST

Conflict of Interest declared as None.

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