

## AROMATHERAPY AND IT'S IMPLICATIONS IN DENTISTRY

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### ABSTRACT

Dental anxiety and fear is a frequently encountered problem in dental offices which often results in avoidance of dental care. A long-term avoidance of dental treatment due to dental anxiety may decline the state of oral health resulting in more missing teeth, decayed teeth, and poor periodontal status. Anxiety is usually managed by both pharmacologically and non-pharmacological methods. Pharmacologic management of anxiety can significantly improve patient outcomes; however, it is associated with some risks, requires additional equipment and cannot be applied to the patients with allergies and other medications. Recently, contemporary and alternative medicine approaches such as aromatherapy have been considered in dental settings as one of the non-pharmacological strategies with the concept that therapeutic use of essential and aromatic oils can produce positive physiological effect by the sense of smell inducing relaxation, and thus quell certain anxiety symptoms. Thus the use of essential oils from plants such as lemon, melaleuca, bergamot, clove, lavender and orange is an alternative to pharmacologic approach since it has shown positive anxiolytic and sedative effects in dentistry and also have been used topically for their antibiotic and antiviral properties for years.

**KEYWORDS:** Aromatherapy, dental anxiety, essential oil, lavender.

### INTRODUCTION

Fear and anxiety toward the dentist and dental treatment are both significant characteristics that contribute to avoidance of dental care.<sup>1</sup> Anxiety associated with the thought of visiting the dentist for preventive care and over dental procedures is referred to as dental anxiety. It has been cited as the fifth-most common cause of anxiety by Agras et al.<sup>2</sup> Treating such anxious patients is stressful for the dentist, due to reduced cooperation, requiring more treatment time and resources, ultimately resulting in an unpleasant experience

for both the patient and the dentist.<sup>3</sup> According to several researches, odors can modulate cognition, mood, and behavior. Recently, alternative treatment approaches such as aromatherapy [that is the application of essential oils of aromatic plants] have received attention in medical and dental settings. The idea behind this method is that common oils can be used to produce a positive physiological or pharmacological effect through the sense of smell.<sup>4</sup> Aromatherapy is the use of concentrated essential oils extracted from herbs, flowers, and other plant parts to treat various diseases.<sup>5</sup> It is categorized as a form of complementary and alternative medicine (CAM) and has been steadily gaining popularity in today's society. The word aromatherapy is used to describe the use of essential oils for aromatic inhalation, compresses and topical application through massage. The inhaled aroma from these "essential" oils is widely believed to stimulate brain function. Essential oils can also be absorbed through the skin, where they travel through the bloodstream and can promote whole-body healing.

### HISTORY OF AROMATHERAPY

The first modern-day distillation of essential oil was performed by the Persian philosopher Avicenna (980-1037 A.D.) who extracted the essence of rose petals through the 'enfleurage' process. His discovery and subsequent use of a wonderful perfume substance eventually lead him to write a book on the healing properties of essential oil of Rose.<sup>7</sup> In 17<sup>th</sup> century people started making perfumes from plants and it was considered as an art. Later in 19<sup>th</sup> century the use of perfumes increased and so the industries related to perfumes increased.<sup>6</sup> Early in the 20<sup>th</sup> century a French Chemist, Rene-Maurice Gattefosse, began studying what he called "Aromatherapy". After several burning his arm in a laboratory accident, he thrust the arm into the nearest liquid, which happened to be tub of Lavender Oil. Surprised by the quick healing that followed, Dr. Gattefosse spent the remainder of

his life researching the value of Essential Oils.<sup>7</sup>

### ACTION OF AROMATHERAPY

Aromatherapy works through our sense of smell. Aromatic essential oils, when inhaled they activate the olfactory nerve cells in the upper nasal cavity. They send impulses to the limbic system of the brain which causes immediate response to the smell by stimulating circulatory and nervous system.<sup>8</sup>

### PHARMACOLOGICAL PROPERTIES OF ESSENTIAL OILS

**Antiseptics:** Example: Cinnamon, Thyme; Clover; Eucalyptus; Culin savory; Lavender. Citral, geraniol, linalool and thymol are much more potent than phenol.

**Expectorants and diuretics:** Oral administration of essential oils like eucalyptus or pin oils, stimulate ciliated epithelial cells to secrete mucus. On the renal system, these are known to increase vasodilatation and in consequence bring about a diuretic effect.

**Spasmolytic and sedative:** Essential oils from the Umbelliferae family, Mentha species and verbenas are reputed to decrease or eliminate gastrointestinal spasms. In other cases, they are known to be effective against insomnia.

**Others:** Choleragogue; anti-inflammatory; cicatrizing.<sup>7</sup>

### TYPES OF AROMATHERAPY

There are many kinds of aromatherapy but its types are divided according to the application and purposes of the essential oils:

**Cosmetic Aromatherapy:** This type of aromatherapy is used for beauty purpose.

**Massage Aromatherapy:** In this therapy, different essential oils are blended and massage is done with them by the expert masseur. This type of therapy is used to get relief from aches and pains.

**Clinical Aromatherapy or Olfactory Aromatherapy:** Clinical aromatherapy is also known as medical aromatherapy. Essential oils are usually mixed with a carrier oil or lotion like sweet almond or apricot kernel. Clinical aromatherapy is closely related with massage aromatherapy as the essential oils may be massaged to the skin. It is the controlled use of essential oils to heal physical, mental and emotional health. It is sometimes called as olfactory aromatherapy. In this type of therapy, diffusers and vaporizers are used to evaporate the

essential oil in the atmosphere of the certain area. The molecules in the air are quickly absorbed by the blood stream and then they start their work. An aromatherapy candle, room spray, or sprinkle of a few drops on a handkerchief can also be used as the means of therapy.<sup>6</sup>

### MODES OF USAGE OF AROMATHERAPY

The most effective way to use most essential oils is by external application or inhalation, though some can be very beneficial when taken internally. The use of essential oils include body oils, compresses, cosmetic lotions, baths, hair rinses, inhalation by steam, perfumes and room sprays. Essential oils are very potent - some will cause skin irritation or have other harmful effects if not used properly. Unless specifically noted, it is best to dilute all essential oils in a carrier of base oil like Almond, Jojoba or Apricot Kernel before applying to the skin - appropriate dilution is usually only 1 - 10% essential oil in carrier. There are three traditional uses of Essential Oils in Aromatherapy.

**Inhalation:** Inhalation is often effective for mood-altering effects of essential oils; Rosemary for mental 'stimulation', Lavender for relaxation, etc. This is the direct effect of essential oil components on the limbic system. One may certainly blend essential oils in a diffuser or burner, adding a couple drops of each oil desired. Often a nice result can be had from mixing a brighter or sweeter oil (Rosemary, Basil, Orange) with one more earthy and grounding (Patchouli, Frankincense, Cedar).<sup>7</sup> Essential oils can be used in the aromatic form through diffusion, direct inhalation, hot water vapor, fans, vents, or humidifiers, and perfumes or cologne.

**Topical Application:** Essential oils are placed on the skin, hair, mouth, teeth, nails, or mucous membranes of the body. This includes direct application, massage, warm compresses, and adding the oils to bathwater. One form of topical application is the practice of oil pulling; oils are swished in the mouth for 5–20 minutes. If essential oils are incorporated in oil-pulling techniques, they are added to another oil, such as coconut or olive oil.<sup>9</sup> Lavender Oil and Chamomile Oil are two essential oils that can be applied 'neat' or without dilution; others, such as Cinnamon Oil and Oregano Oil should not be applied topically in most cases - they may be applied once highly diluted to the bottoms of the feet.<sup>7</sup>

**Ingestion:** This method of application is by consuming or otherwise internalizing the oil into the body. Internal application of an essential oil includes placing oils under the tongue, adding oils to beverages or foods while cooking, and placing

oils in capsules to ingest. It is important to recognize that only pure oils should be used for internal consumption. The US Food and Drug Administration labels some essential oils as GRAS, meaning generally recognized as safe for human consumption.<sup>9</sup>

### BENEFITS OF ESSENTIAL OILS

- ✓ They are powerful antioxidants which help to eliminate free radicals and prevent mutations, fungus, and oxidation in the cells.
- ✓ Contains the same regenerating, oxygenating, and immune-strengthening characteristics of the plants from which they are extracted.
- ✓ Have both antimicrobial and antibacterial properties.<sup>9</sup> Microorganisms, however, do not appear to develop tolerance or resistance to the antibacterial effects of essential oils, and essential oils' antimicrobial power does not diminish over time.<sup>10</sup>
- ✓ The combination of essential-oil mouthrinse and subgingival ultrasonic instrumentation has shown improved subgingival bacterial count reduction in both shallow and deep pockets when tested on chronic periodontitis patients.<sup>11</sup>

### DENTAL APPLICATION OF ESSENTIAL OILS<sup>9</sup>

Periodontal abscess	Clove, helichrysum, melaleuca, frankincense, Roman chamomile, or wintergreen
Aphthous ulcers	Melaleuca, oregano, Roman chamomile, myrrh, basil, or orange
Bruxism	A combination of lavender, sweet marjoram, Roman chamomile, ylang-ylang, sandalwood, or vanilla bean extract
Candida	Melaleuca, oregano, clove, peppermint, thyme, lavender, eucalyptus, or rosemary
Caries prevention	Melaleuca, peppermint,

	eucalyptus, or cinnamon
Gingiva/gingivitis	Myrrh, lavender, melaleuca, helichrysum, or Roman chamomile
Halitosis	Peppermint, patchouli, or lavender
Herpes simplex	Peppermint, melaleuca, helichrysum, clove, lavender, eucalyptus, lemon, cypress, rose, or bergamot
Periodontal disease	Melaleuca, helichrysum, myrrh, or rose
Teething	A combination of lavender, sweet marjoram, Roman chamomile, ylang-ylang, sandalwood, or vanilla bean extract
Toothache	Clove, melaleuca, or Roman chamomile

### ESSENTIAL OILS AFFECTING OVERALL WELL-BEING<sup>6</sup>

Anxiety	Bergamot, Clary Sage, Cedarwood, Frankincense, Lavender, Geranium, Neroli, Mandarin, Patchouli, Rose, Roman Chamomile, Vetiver, Sandalwood
Fear	Bergamot, Clary Sage, Cedarwood, Frankincense, Jasmine, Grapefruit, Lemon, Orange, Neroli, Vetiver, Roman Chamomile Sandalwood
Stress	Benzoin, Clary Sage, Bergamot, Geranium, Frankincense, Jasmine, Grapefruit, Lavender, Neroli, Mandarin, Roman Chamomile, Patchouli, Rose, Vetiver, Sandalwood, ylang-ylang
Panic Attacks	Frankincense, Lavender, Helichrysum, Rose, Neroli

### PLANTS AND THEIR ESSENTIAL OILS USED IN CLINICAL DENTISTRY

Particular essential oils can be used to treat a large variety of conditions and therefore would be best suited to be kept in the dental office. These

include melaleuca, helichrysum, Roman chamomile, clove, and lavender.

**Melaleuca:** It is commonly known as tea tree oil. It comes from a plant in Australia that resembles a shrub. Its properties were discovered by Aborigines who would chew on the leaves and brew them as a tea. Melaleuca is commonly known as an antiseptic and an antifungal agent. Terpenoid and cineole are believed to be the chemical compounds in melaleuca oil that make it clinically effective. Terpenoid contributes to its healing properties and cineole facilitates disinfection of surfaces where it is applied.<sup>12</sup> A study conducted on German chamomile and melaleuca found that melaleuca was more effective at removing the smear layer and was a better choice for disinfection for root canals with less possibility of toxicity.<sup>13</sup>

**Clove:** Clove oil is rich in minerals, such as calcium, hydrochloric acid, iron, phosphorus, sodium, potassium, and vitamins A and C. Its main chemical compound is eugenol, which is full of antioxidants and insecticidal components. Clove can be used as a topical application to relieve pain and promote healing.<sup>14</sup> Kuwait University researchers completed a study that examined whether clove oil could replace benzocaine as a topical anesthetic. They concluded that clove oil can be used in place of benzocaine topical. The use of clove oil as a topical anesthetic agent instead of benzocaine will reduce the dose of drugs the patient absorbs and is a less expensive alternative.<sup>15</sup>

**Lavender:** The active ingredients in lavender oil are terpenes and sesquiterpines. Although most consider lavender to be mainly used in aromatherapy, it also has anti-inflammatory and antimicrobial components. It is known for its relaxing, carminative, and sedative effects and its ability to eliminate nervous tension. Researchers from London's King's College determined that lavender aromatherapy used in dental offices reduces anxiety levels in patients.<sup>16</sup> A study by Venkataramana et al (2016) provide an evidence that Lavender is an effective means of reducing current anxiety levels and should be perceived as a means of "on-the-spot" reduction of anxiety.<sup>17</sup>

**Orange:** In a study conducted by Jafarzadeh et al (2013), orange oil aromatherapy proved successful for reducing childhood anxiety<sup>18</sup> which confirmed a Brazilian study conducted by Goes et al (2012) on healthy men which significantly reduced the anxiety levels of the men in the orange oil group compared to the two groups (tea tree oil or a control (water)).<sup>19</sup>

## AROMATHERAPY AND SAFETY ISSUES

The essential oils are generally safe with minimum adverse effects. Several of these have

been approved as food additives and fall in the category of generally recognized as safe by the U.S. Food and Drug Administration.<sup>20</sup> In addition, with the benefits there are potential safety concerns. Phototoxic reactions may occur with citrus peel oils such as lemon or lime. Some of the chemical allergies could even be caused by pesticides, if the original plants are cultivated.<sup>6</sup> Allergic reactions have been reported in few instances, especially with topical administration.<sup>20</sup> Pregnant women, people with severe asthma, and people with a history of allergies should only use essential oils under the guidance of a trained professional after consultation of physician. Hyssop oil therapy should be avoided in pregnancy and in people with a history of seizures. Stimulating essential oils, such as rosemary and spike lavender should be avoided in people with high blood pressure. Reversible prepubertal gynecomastia was reported in one study on repeated exposure to lavender and tea tree oils by topical administration.<sup>21</sup> People with estrogen dependent tumors (such as breast or ovarian cancer) should not use oils with estrogen like compounds such as fennel, aniseed, sage, and clary-sage.<sup>20</sup>

## CONCLUSION

Managing dental anxiety has been suggested as one of the most difficult task for dental practitioners. The most common way of managing is the use of conscious sedation or general anesthesia but the therapies such as aromatherapy are gaining acceptance by general population. The inhalation of different odors in aromatherapy been related to relaxation, alertness, attention, performance, and healing. In addition, a great number of essential oils are currently in use as aromatherapy agents to relieve stress and depression. Thus these oils are considered a holistic complementary therapy utilized for increased comfort and reduce stress.

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