**Essential Oils and Thyroid Conditions**

**Overall research on essential oils and the thyroid**

Essential oils are scented liquids extracted from some specific plants using pressure or steam. Basically, essential oils are composed of natural chemicals with characteristic odor and flavor. These oils are applied in various medical fields and aromatherapy. The essences of these oils are manufactured under the leaves surfaces, barks, and peels of certain special plant cells. Biologically, this process is aided by the solar energy and some air, soil and water elements. Therefore, upon the crush of the plant, it releases its fragrance and essence. It is these essences extracted from natural plants that become essential oils, and are pressed mechanically or obtained through steam distillation.

In the health sector, many of these essential oils are used in aromatherapy, which entail for healing and cosmetic purposes. Examples of volatile oils that have been widely applied in aromatherapy include Roman chamomile, geranium, lavender, tea tree, lemon, cedarwood, and bergamot (Olivia, 2016). However, each one of the volatile oils has a different chemical composition, smell, and absorption abilities, which depend on individual users. This implies that even those plants of the same species may produce oils of diverse chemical compositions. Notably, the volatile oils are very concentrated, volatile, and evaporate very quickly when unprotected from open air.

Most essential oils have been used across the world due to their aromatic and therapeutic benefits. In other areas, they have been applied in emotional and wellness uses either in form of single oils or complex blends based on the expected outcomes (Prema, n.d). In connection with thyroid conditions, the essential oils are usually administered through aromatic diffusion, tropical application and sometimes consumed as dietary supplements (Trentini, 2014). It is crucial to note that the volatile oils are chemical potent, which describes their improved level of activity in most of the applications. Through this characteristic, they have a unique effect on the brain and the olfactory system and affect physiological functions of the skin. Their effects are important in regenerating, oxygenating, and defending the immune system, which is comparable to human blood.These essential oils have some salient characteristics. Notably, a few of the most volatile oils are anti-inflammatory in nature. Some of the example of anti-inflammatory agents includes Cypernium, vitality, lavender and basil. Moreover, some are antiseptic/anti-viral depending on the various degree of effectiveness (LaRee, 2012). For instance, Deliverance, MelaPlus, eucalyptus, etc. possess tis unique trait.

With respect to the thyroid, these essential oils are vital in maintaining the general body metabolism at a constant level (Dr. Axe, 2018). This is achieved through its antibiotic, antiseptic, anti-fungal, antioxidant, anti-parasitic, anti-viral and antidepressant properties (Prema, n.d). The essential oils aid in providing both nutrients and oxygen to the cells to facilitate proper disposal of carbon dioxide and other related wastes. Through this activity, they aid in increasing the blood flow within the human body, improved negative ions utilization and an improved efficiency of the immune system coupled with a reduction in blood viscosity. Therefore, these vital oils improve blood wave function and lead to a beautiful balance of the body .In aromatherapy, essential oils have widely been used and applied in physical, mental, emotional, and spiritual balance. Therefore, the paper undertakes to explore into how these vital oils have been used in treating thyroid conditions, for example, hypothyroid.

Thyroid disease or condition is a medical abnormality that occurs in the body due to either under- or over-functioning of the thyroid gland (Vandana et al., 2017). This gland is essential as it helps in terms of thyroid hormone production that is responsible for regulations of the metabolic activities within the body (Olivia, 2016). In other terms, thyroid disorders are the medical conditions that adversely affect the thyroid gland physiologic functions. Depending on the type of the thyroid disorder, such complications do affect either the structure or function of the thyroid. The brain is involved in regulating the functions of the thyroid gland through feedback mechanisms (Mahdy, n.d). For low levels of thyroid hormone, the hypothalamus, which part of the brain, produces the thyroid-releasing hormone (TRH) that compels the pituitary gland to release thyroid-stimulating hormone (TSH). The TSH causes stimulation in the thyroid gland to increase the release of T4 (Vandana et al., 2017). Additionally, the thyroid disease can cause an enlargement of the thyroid gland and an ultimately increased discomfort in front of the neck. Therefore, the paper also discusses on hypothyroidism. Hypothyroidism is a condition in which the thyroid gland produces inadequate quantities of thyroid hormone. In most cases, it results from complications related to the thyroid gland, the pituitary gland or the hypothalamus. Some of the basic symptoms of hypothyroidism include fatigue, poor mental concentration, dry skin, constipation, fluid retention and feeling cold, depression among others (Johnathan, n.d).In many cases, Hashimoto's thyroiditis is a common cause of hypothyroidism; whereby the body immune system attacks the thyroid gland. Therefore, the tissue will die upon the attack and cease to produce hormones. This situation is called the autoimmune disorder.

**How essential oils treat thyroid conditions**

Generally, scents are able to initiate physical reactions in individuals’ bodies as fast as possible and later have lasting effects. Scientifically, some essential oils react biochemically, which copies mechanism of the anti-anxiety medicines that react with some neuro-receptors. Therefore, aromatherapy is able to tap the healing power of scents perpetuating from the volatile oils to achieve the overall balance in mind, body, and spirit (Wei, 2017). Hence, some of these essential oils help in relieving stress-causing relaxation of the body and aid in the general achievement of better sleep (The Alternative Daily, 2015). For instance, a detailed analysis of the various essential oils reveals that lavender volatile oil has relaxing effects.  Ideally, this essential oil lowers the blood pressure, reduces the heart rate, and regulates the skin temperatures. Through these activities, the oil is able to calm down the nervous system and lead to the general achievement in a relaxed state of brain waves (Wei, 2017). In addition to this, it can result in mild-insomnia that facilitates better sleep among individuals. Furthermore, lavender (as an essential oil) helps in reducing the general anxiety and depression among many women. By reducing depression, it achieves the healing effects of reducing hypothyroidism. The reduced depression is usually achieved in women with postpartum depression. In dental facilities and intensive care units (ICUs), the lavender aids in reducing anxiety related to surgery. The consistency of relaxation of various body parts is further observed in the ability of lavender to stimulate the various brain pathways (Aromatherapy.com, 2010).This effect is inclusive of the limbic system that ultimately influences the human emotional response and the memories. Proof of this analysis has been made possible by the use of both the electroencephalography (EEG) and the functional magnetic resonance imaging (fMRI) of the brain.

Furthermore, the chemical composition of lavender makes it a better garden herb for alleviating the detrimental effects of hypothyroidism. For example, within its components are camphor, terpinene-4-ol, linalool, linalyl acetate, beta-ocimene and 1, 8-cineole (Ali et al., 2015). However, the constituents differ in terms of concentration and therapeutic effects; and these factors are greatly influenced by the species. Ali et al., (2015) contends that the anxiety patients with irregular sleeping patterns may use lavender under their pillows to improve the general feeling of well-being, leverage mental alertness, and finally mitigate on aggression and anxiety. Finally, its sedative and stimulation properties are responsible for improving the general health when used in aromatherapy for treating various diseases. With reference to hypothyroidism, however, they are inhaled as relaxants and strong antioxidants that aid in the management of certain severe diseases.

Other than the lavender, tea-tree is another vital essential oil used in the treatment of hypothyroidism-related disorders. The herb is used in aromatherapy belongs to the family Myrtaceae. The major constituents of this plant’s oil are terpinen-4-ol and an alcoholic terpene that usually possess clean musty aroma. Additionally, it has an alpha-Sabine aroma that contains antibacterial and antifungal effects and is responsible for its salient anti-viral characteristics (Ewao.com, 2011). The terpinen-4-ol makes it a better immune booster. Additionally, it has other properties like anti-inflammatory, antiviral, insecticidal and immune stimulation that make the thyroid gland free from infection whose effects could lead to lower production of thyroid hormones, which helps in terminating hypothyroidism (Ali, et al., 2015). Regarding the aforementioned symptoms of hypothyroidism, the tea-tree oil is used in the treatment of blisters, cold scores, burns, and attainment of oily skin. This implies that it has widely been applied in the treatment of ailments associated with respiratory disorders such as a cough, bronchitis, and asthma.

Similarly, the eucalyptus has a very strong and fresh aroma that aids in opening up airways in human beings (Dhifi et al., 2016). Basically, this aromatic oil is antimicrobial, antifungal, antibacterial, antiviral and anti-inflammatory (Ali, et al., 2015). Therefore, this characteristic is vital in terms of dealing with respiratory complications including colds, coughs, asthma, muscle pain, skin care and dental care. By easing respiratory processes including the relief from colds and coughs, this oil is very important in protecting individuals from thyroid diseases. For example, eucalyptus, Bergamot oil is used in aromatherapy to curb the effects of stress, anorexia, and depression in human beings. The oil is occasionally applied in treating skin-related infections including psoriasis and eczema. Therefore, it has the ability to relieve one of malaise. Consequently, it has the capability to counter the adverse effects of hypothyroidism when used in aromatherapy. Even the cedarwood is able to calm and alleviate stress and anxiety-related conditions through its ability to provide spiritual lift. Coupled with this, is its ability to thwart the effects of respiratory disorders and skin diseases.

**The effectiveness of essential oils (EOs)**

Research has findings show that bacteria are responsible for inflammatory disorders in human beings. Such inflammation may cause pain if not treated in time with the appropriate essential oils. For instance, the gram-negative have greater ability to resist EOs as compared to gram-positive ones. Based on the cell-wall structure of the two types of bacteria, gram-positive bacteria cell wall facilitates the penetration of hydrophobic molecules across the cell walls and take part in the chemical reactions within the cytoplasm. The phenolic compounds that exist within the EOs display antimicrobial action against gram-positive bacteria (Nazzaro, et al., 2013). Therefore, the effects of the bacteria depend on the concentrations of the compounds; whereby they deactivate enzymes at higher concentrations while at lower concentrations, they can compromise the metabolic reactions production by curtailing energy production by some enzymes. The mentioned activity, of EOs on bacteria makes them very effective components of treating thyroid conditions.

 For the effective understanding active therapeutic agents in EOs, there is need for an analysis of the mechanisms through which these EOs act on targeted sites in the body. Notably, the antimicrobial activities of all essential oils depend upon the chemical compositions of those EOs and the quantity of the single components (Mallappa, Mohd and Uma, 2016). More quantities of EOs contribute to vegetables, fruits or spices to inducing a self-defense mechanism against pathogens. However, the existence of such molecules in the EOs is usually in either active or inactive nature. Some would be activated through other chemical processes including subjection to either biotic or abiotic stress (Nazzaro, et al., 2013). Therefore, depending on the quantities of such molecules, they affect the rates of antimicrobial activity (Mallappa, Mohd, and Uma, 2016). For instance, higher levels of cinnamic aldehyde, eugenol or citral confer such microbial characteristics to Essential Oils (Nazzaro, et al., 2013).

Essential oils behave differently against bacteria cells. This behavior is dependent on various activities of EOs and their effects on the cell wall as well as the cytoplasm of those particular bacteria. Since the EOs are hydrophobic, the hydrophobicity facilitates the interruption of bacterial structures to facilitate higher permeability chances owing to the fact that the bacteria will not be able to separate the essential oils from the cell membrane of the bacteria. Therefore, the cell will not be able to maintain its functions; like cell’s energy status, transportation of solute substances and the regulation of metabolic processes of the cell. Additionally, the cell membranes are responsible for controlling the turgor pressure of the cell. Therefore, the consequences of toxicity of the cell membrane and their respective roles are vital in explaining how effective these essential oils are with respect to their antimicrobial activity (Nazzaro et al., 2013).

The hydrophobic property of these essential oils is important in the destruction of microbial cells upon penetration and this effect eventually leads to interference with the cell’s functionality. This expounds why essential oils are very effective in handling gram-negative bacteria as compared to gram-positive bacteria. This destructive nature prevents the growth of cancerous cells within the thyroid that could lead to abnormal functioning of the thyroid gland and finally cause the inadequate production of thyroid hormone [(Natalie, 2009).](http://cssf.usc.edu/History/2009/Projects/J1732.pdf) Precisely, this antimicrobial activity of essential oils prevents hypothyroidism.

Gram-negative bacteria are able to prevent the penetration of essential oils into the cell wall of the microorganisms. However, this is not advantageous to the bacteria since the EOs on the bacterial walls can restrict the transportation of various molecules into the cell by meddling with the proteins on the cell wall. As a result, the essential oils on the cell wall will be able to subvert the phospholipid bilayer and lead to the obliteration of plasma membrane. This implies that the composition and roles of such plasma membrane will be terminated and that some important intracellular components will cause a general inactivation of the vital enzymes coupled with interference with some electron transport systems (Nazzaro, et al., 2013). When this happens, such microorganisms will not be able to cause complications related to hypothyroidism.

Other therapeutic properties of essential oils are linked to their effects on the detoxification enzymes. For example, the genotoxins can cause the destruction of internal antioxidants and antioxidant enzymes, including superoxide dismutase (SOD), catalase, and glutathione peroxidase (GPx) (Gautam, Mantha and Mittal, 2014). Depending on the phases, the detoxification enzymes are able to destroy detrimental compounds. Therefore, essential oils play vital roles during the induction of detoxification enzymes. This action facilitates the prevention of induced-toxicity and destroys cells that might lead to the destruction of vital hormone-producing organs. For example, Citral is one of the compounds that catalyze the action of phase II detoxification enzymes to prevent thyroid-related disorders from taking lead activities in the thyroid (Gautam, Mantha, and Mittal, 2014).

Notably, cancerous cells have detrimental effects on the body and may occasionally affect the production of thyroid hormones. Therefore, the essential oils have inherent preventive mechanism against cancer. Additionally, the antioxidant property of essential oils aid in scavenging free radicals produced in the disease state (Gautam, Mantha & Mittal, 2014). Such mechanism helps in curtailing the growth of cancerous cells that could lead to tumors. The prevention of such abnormal growths hinders the interference with thyroid glands that could lead to the abnormal production of thyroid hormones if not treated. Hence, the anticancer activity of essential oils prevents hypothyroid conditions in human beings.

The essential oils do not treat cancer but rather used to manage symptoms of metastatic cancer or any other type of cancer at nearly early stages. This is possible because the small receptors that exist in the nose respond to scents of essential oils when used in aromatherapy. The response is possible because the EOs communicate chemically by sending signals to the limbic system of the brain through the nerves (National Cancer Institute, 2017). When the signals reach the brain, an individual reacts accordingly to changes in mood and emotions. Therefore, the smells have relieving effects of regulating the quantities of thyroid hormones produced by the thyroid glands.

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