The Effects of Aromatherapy on Stress

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Abstract

PURPOSE: The purpose of the paper is to discuss the effects of aromatherapy on stress (physical symptoms, levels of anxiety, perceived stresses). Stress will be described along with who it affects and the cost. Stress physiology will be described. Aromatherapy and the effects on the olfactory system will be addressed. Finally some of the more recent research on pharmacological effects of some essential oils (EOs) combined with some practical applications will be described.

Table of Figures

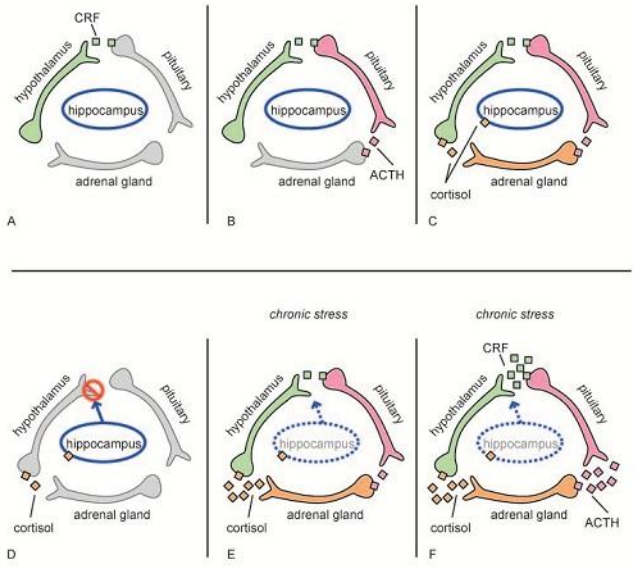

Figure 1. The central role of the HPA axis in stress processing makes it logical that it would be involved in the risk for anxiety disorders. The normal stress response involves activation of the hypothalamus and a resultant increase in corticotrophin releasing factor (CRF) (**A**), which in turn stimulates the release of adrenocorticotrophic hormone (ACTH) from the pituitary gland (**B**). ACTH causes glucocorticoid release (cortisol in humans) from the adrenal gland, which binds to receptors in the hypothalamus, pituitary, and hippocampus (**C**). Glucocorticoid binding in the hypothalamus inhibits CRF release, ending the stress response (**D**). In addition, the hippocampus plays a role in inhibiting the stress response (**D**).In situations of chronic stress, excessive glucocorticoid release may eventually lead to hippocampal atrophy, thus preventing it from inhibiting the HPA axis (**E**). This could contribute to chronic activation of the HPA axis (**F**) and increase risk for an anxiety disorder. ("Back to Basics," 2010)

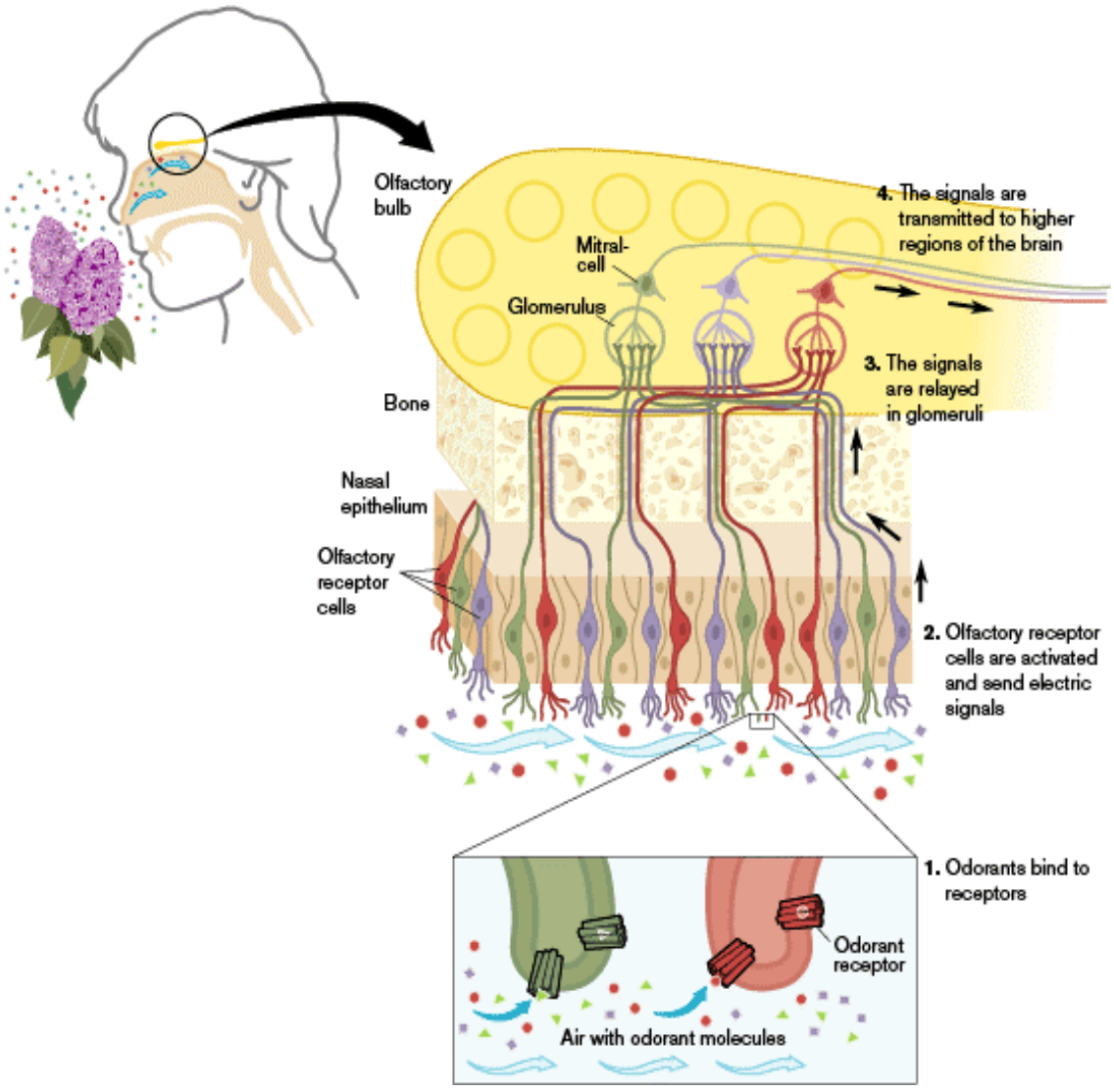

Figure 2. . *Nose and Olfactory System* ("Current Science," 2004)

How Does Aromatherapy Effect Stress

Stress is multi-layered and can affect the entire human body. Viewing heath as a balance, an interlaced relationship between the body, mind, and spirit makes it easy to see the impact that stress creates in our everyday lives.

Stress related disorders cost the nation more that $42 million dollars annually and 75-90% of doctor visits are stress related. More than 19 million people are afflicted by stress and anxiety related conditions each year, but less than one-third of these people seek treatment. 43% of these people are also depressed and have alcohol or substance abuse problems. (Marshall) The disability caused by stress in just as great as the disability caused by workplace accidents or other common medical conditions such as hypertension, diabetes, and arthritis. (Kalia, 2002)

People under stress sleep poorly and are less likely to exercise; they adopt poor eating habits, smoke more and don't comply with medical treatment. (Marshall) Stress also triggers a response by the body's endocrine system, which releases hormones that influence multiple other biological systems, including the immune system. Figure 1 illustrates the Hypothalamic Pituitary Adrenal Axis in stress processing.

Workplace stress is of much concern. Levels of stress-related illness are nearly twice as high for women compared to men. Job stress has been linked with heart disease, muscle/bone disorders, depression, and burnout. Heavy job load, job insecurity, and work that is repetitive and boring all lead to job stress. (Marshall)

Various approaches have been involved in workplace stress management. Aromatherapy, due to easy implementation and effectiveness, is one of them. Essential oils are used to reduce body tension and emotional stress. (Chang & Shen, 2011)

Aromatherapy is the ancient practice of using very concentrated plant extracts called essential oils (EOs). An EO is a volatile, highly concentrated extract from plants. Various parts of plants (flowers, leaves, roots, seeds, sap, or bark) are used depending on the EO. Each specific EO is composed of many individual molecular constituents; the particular constituents and their ratios are unique to a particular EO. (DePaula & Lafferty, 2010)

EOs are extracted from natural raw materials through water or steam distillation. Plant material is heated with water and brought to a boil. The steam containing the volatile EO is run through a cooler where it condenses, and the liquid distillate is gathered. The essential oil appears as a thin film on top of the liquid. In few cases, the oil is heavier than water and sinks to the bottom. Through special technical processes, the oil is separated from the water. (Schnaubelt, 1998)

Expression is a process used to extract EO from citrus fruits. The rind of the citrus fruit is squeezed until the oil globules burst and the essential oil is collected. Essential Oils are stored in amber, cobalt, or violet colored glass bottles in a cool, dry place to prevent degradation and evaporation. Many EOs can dissolve plastic, and plastic is porous and will allow oxidation of the EO. (DePaula & Lafferty, 2010)

Smell, almost more than any other sense, has the ability to bring up memories, change moods or ease tension. Odor molecules travel to the top of the nasal cavity and fit like little puzzle pieces into specific receptor cells on the cilia. The cilia are little bundles of six to eight tiny hairs which extend for each of about 10 million olfactory nerve cells. These millions of nerve cells make up a membrane which is known as the olfactory epithelium. The epithelium serves to transfer electric impulses from the cilia to the olfactory bulb, which it covers. The

olfactory bulb, in turn, sends those impulses along to the amygdala (which is responsible for storing and releasing emotional trauma) and further on to the limbic system of the brain. Because the limbic system is directly connected to those parts of the brain that control heart rate, blood pressure, breathing, memory, stress levels, and hormone balance, essential oils can have some very profound physiological and psychological effects. (Davis, 2002) (Figure 2.)

Euphoric odors, such as clary sage *(Salvia sclarea)*, grapefruit *(Citrus paradisi)*, and jasmine *(Jasminum officinale)* tend to stimulate the thalamus. This stimulation causes the thalamus to secrete neurotransmitter called enkephalins. Enkephalins act as pain killers but also induce feelings of wellbeing or euphoria. Inhaling aphrodisiac odors such as patchouli *(Pogostemon patchouli)* and ylang ylang *(Cananga odorata)* result in the stimulation of the pituitary gland which then secretes endorphins. Endorphins are also painkillers and induce feelings of euphoria and increase sexuality. The pituitary gland also governs the other endocrine glands in the boy including the thyroid, adrenals, and sexual glands. Chamomile *(Roman chamomile)*, lavender *(Lavandula augustifolia)*, and orange blossom *(Citrus sinensis*) are examples of EOs that stimulate the raphe nucleus. When the raphe nucleus is stimulated it releases serotonin. Serotonin acts as a sedative neurotransmitter. When the locus ceruleus is stimulated is releases noradrenaline which is more energizing. Rosemary *(Rosmarinus officinalis)*, lemongrass *(Cymbopogon citratus)*, and juniper *(Juniperus communis)* are stimulating to the body. (www.diy-stress-relief.com, March 7, 2011)

There are precautions involved with the use of essential oils. Do not take EOs internally and do not apply directly to the skin. Clary sage should not be used in pregnancy and may potentiate the effects of alcohol. (Walters, 1998) Grapefruit and orange are phototoxic and should be used in small amounts and exposure to direct sunlight should be avoided for several

hours after applying on the skin. People with a history of seizure disorders should avoid rosemary. (Schiller & Schiller, 2008) Jasmine should also be avoided during pregnancy. It can be beneficial during labor though, as it strengthens uterine contractions and relieves pain. Also to be avoided during pregnancy is juniper, lemongrass, and rosemary. Avoid the use of juniper if a person has kidney disease and it can irritate the skin in large quantities. Patchouli may cause loss of appetite. (Walters, 1998)

EOs can lower a rapid heart rate and slow breathing. International Flavors and Fragrance (IFF) researchers have patented a blend of neroli *(Citrus aurantium),* valerian *(Valeriana officinalis)*, and nutmeg *(Myristica aromata)*to ease stress in the workplace. Nutmeg and valerian can dull the senses and should not be used before driving. (Schiller & Schiller, 2008) When past IFF researcher Henry G. Walter, Jr. placed people in a room scented with lavender, bergamot, marjoram, sandalwood, lemon, or chamomile, they tended to mingle more and were less competitive. According to the subjects' brainwave reactions, all of these scents produced a relaxing effect. In the twentieth century, Italian doctors and researchers Giovanni Gatti and Renato Cayola found that the most sedating oils were neroli, petitgrain, chamomile, valerian, and a low-grade myrrh called opopanax. Ylang Ylang is also one of the most potent aromatherapy relaxants. (Keville, 1996/2009) Use caution when applying bergamot and lemon to the skin as they are phototoxic and marjoram may dull the senses and should not be used before driving. (Schiller & Schiller, 2008)

In a study conducted by Chan and Shen, fifty-four elementary school teachers were recruited to evaluate aromatherapy on decreasing stress. Bergamot essential oil was used for aromatherapy spray for 10 minutes. Blood pressure and autonomic nervous system parameter were recorded 5 minutes before and after the application of the spray. Smoking, drinking

alcohol and coffee were not allowed for six hours before using the spray. Data showed that the aromatherapy spray was effective in promoting parasympathetic activation, reducing blood pressure and heart rate. This study also found that after two 10 minute aromatherapy sprays with bergamot essential oil on elementary school teachers; the parasympathetic nervous system was enhanced. Aromatherapy was effective for moderate to severe anxiety groups. However, there was no significant statistical effect for the light anxiety group. Whether aromatherapy is beneficial for long-term anxiety reduction is still an open issue. (Chang & Shen, 2011)

This has been an overview of the financial and physical effects of stress on the population. Essential oils, what they are and how they are obtained were addressed. An overview of the olfactory system followed. Finally some research findings were shared. One of the main criticisms about aromatherapy is there is not enough research, that is published research. There is a wealth of clinical observation that goes unrecognized because no one documents it in a way that conventional medicine would accept. Most of the current research is done in countries where herbal medicine never went out of style. There is still plenty of room for clinical research in the United States, as we search for safer and less expensive methods to deal with the overwhelming effects of stress and anxiety in our lives.

This article is for educational purposes only and is not intended to replace the services of a health practitioner. The safe and proper use of the oils is the sole responsibility of the reader.

References

The 2004 Nobel Prize in Physiology or Medicine. (2004, December 10). *Current Science, 87*(11). Retrieved from www.ias.ac.in/currsci/dec102004/1500.pdf

Chang, K. M., & Shen, C. W. (2011). Aromatherapy Benefits Autonomic Nervous System Regulation for Elementary School Faculty in Taiwan. *Evidenced Based Complementary Alternative Medicine, 946537*. Retrieved from www.ncbi.nlm.nih.gov/pmc/articles

Davis, Jane. (2002). *Make a Healthier Choice with Essential Oils*. San Francisco: Sparkplug Graphics.

DePaula, G. F., & Lafferty, D. F. (2010). Aromatherapy in Psychiatry. In *Integrative Psychiatry* (p. 112-113). New York: Oxford University Press, Inc.

Hypothalamic Pituitary Adrenal Axis. (2010, April). *Back to Basics*. Hypothalamic Pituitary Adrenal Axis Http://www.neiglobal.com

Kalia, M. (2002). Assessing the economic impact of stress-the modern day hidden epidemic. *Metabolism, 15*, 49-53.

Keville, K. (2009). *The Little Book of Aromatherapy*. New York: Crossing Press. (Original work published 1996)

Marshall, K. MS. (Medical Director Gaia Herbs). *Understanding Everyday Stress: Diagnostics and Botanical Solutions*. Video posted to www.gaiaprofessional.com

Schiller, C., & Schiller, D. (2008). *The Aromatherapy Encyclopedia: A Concise Guide to Over 385 Plant Oils*. Laguna Beach, CA: Basic Health Publications, Inc.

Schnaubelt, K. Ph D. (1998). *Advanced Aromatherapy*. Rochester, Vermont: Healing Arts Press.

Walters, C. (1998). *Aromatherapy: An Illustrated Guide*. Boston: Elements Books Inc.