




2015

Combination of Music and Aromatherapy to Improve the Efficiency of Motor Functions and Speech in Patients Paralyzed From Stroke.

Mounica Bevara

Virginia Commonwealth University

Follow this and additional works at: <https://scholarscompass.vcu.edu/urespsters>

 Part of the [Alternative and Complementary Medicine Commons](#), [Physiotherapy Commons](#), [Somatic Bodywork and Related Therapeutic Practices Commons](#), [Translational Medical Research Commons](#), and the [Vocational Rehabilitation Counseling Commons](#)

© The Author(s)

Downloaded from

Bevara, Mounica, "Combination of Music and Aromatherapy to Improve the Efficiency of Motor Functions and Speech in Patients Paralyzed From Stroke." (2015). *Undergraduate Research Posters*. Poster 187.

<https://scholarscompass.vcu.edu/urespsters/187>

This Book is brought to you for free and open access by the Undergraduate Research Opportunities Program at VCU Scholars Compass. It has been accepted for inclusion in Undergraduate Research Posters by an authorized administrator of VCU Scholars Compass. For more information, please contact libcompass@vcu.edu.



Smelling Sounds: The Combination of Music and Aromatherapy to Improve the Efficiency of Motor Functions and Speech in Patients Paralyzed From Stroke.

Mounica Bevara • Virginia Commonwealth University

Introduction:

Currently the fifth leading cause of death and the highest cause of disability in the United States, stroke is a disease that can target anyone at anytime. A stroke is an attack on the brain that occurs when oxygen flow to the brain is unavailable. The oxygen-deprived brain cells degenerate and functions that are controlled by the area of the brain that has been affected are lost. Abilities such as motor and speech functions, muscle control, and memories are jeopardized. A small stroke may result in minor problems such as muscle pain, weakness or discomfort. However, a larger stroke may lead to paralysis and the loss of speech and motor functions.

Ayurvedic medicine employs massage therapy in a number of nations, mainly prevalent in southern India. Practitioners of massage therapy use oils from herbs in order to relieve stress and prompt mobility in patients that have been paralyzed due to various reasons. Although aromatherapy has been used in ayurvedic practices, it has not been paired with music therapy, which would enhance the effect of the complementary treatment. Music therapy has also been employed in many practices to treat mental disorders but not much research has been conducted to determine the effect on physiological treatments.

Methods:

Physiotherapy is a healthcare profession that aims to diagnose, and repair disease and disability through training mechanisms. Various third world nations that do not have easy access to western medicine opt to use ayurvedic methods of healing. Ayurvedic treatment is based of natural practices using various techniques that do not involve drug based western medicine. The idea of this way of healing is to avoid antioxidants and toxic materials to treat patients, but rather to utilize products and practices such as herbs, minerals, and metals in massage therapy, aromatherapy and a multitude of approaches.

Results:

Results were obtained through research of various databases and the study of multiple previous studies.

Aromatherapy Treatment using *A. calamus* and *Gingko biloba*:

Aromatherapy using oils extracted from lavender and *Gingko biloba*, has the ability to inhibit apoptosis. The inhibition of apoptosis will prevent the degeneration of valuable brain cells, therefore retaining valuable cells that store memories in the hippocampus and cells that originate motor functions as well as speech.

Entrainment Mechanisms in Rhythm Perception

Entrainment is musical processing by the brain in response to rhythm perception. Rhythm perception refers to the brains ability to sync up rhythms with external auditory stimuli that will trigger a response in motor or speech functions. By allowing aromatherapy to be administered in combination with music therapy, patients have a chance at obtaining motor functions faster as the brain engages in musical processing that can also prompt non-musical learning.

Correlating the Olfactory and Auditory Systems Through Transduction:

Transduction refers to the notion of various sensory systems throughout the body working together in order to relay information. In this case, the auditory and olfactory systems function as one in order to obtain the most effective response from a sound and a scent combined. Either the auditory or the olfactory will be stimulated by external stimuli and will circulate the information to the other sensory systems. When discussed in relation to brain function, transduction will allow the auditory and olfactory systems to share information in order to emit an appropriate motor function or to assist in memory retention.

Conclusions:

Music and aromatherapy are more effective when administered together because stimulating both the auditory and olfactory system allows for transduction between the two hemispheres of the brain, therefore prompting transduction between the two systems as well as reticulospinal pathways that connect the spinal cord to the brain. Using aromatherapy for post-stroke symptoms is most effective when using oils from herbs such as lavender, turmeric, *A. calamus* and *Gingko biloba*. This is mainly because they have strong scents that can effect the stimulation of pathways in the spinal cord. Music therapy can also affect pathways that lead to the brain in the same manner and can lead to the activation of deactivated pathways to prompt muscle function and motor movement.



Acorus calamus



Gingko biloba

Works Cited:

Barnett, Jeffery. "Aromatherapy." *Complementary and Alternative Medicine for Psychologists: An Essential Resource* (2014): 181-191. *American Physiotherapy Association*. Web. 5 Sept. 2015.
Godwin, Kyle, Joan Wasserman, and Sharon Ostwald. "Cost Associated with Stroke: Outpatient Rehabilitative Services and Medication." *Topics in Stroke Rehabilitation*. 18.1 (2011): 675-684. *PubMed*. Web. 18 Nov. 2015.
Han, Seok, Volker Gudziol, Antje Hähner, and Thomas Hummel. "Background Sound Modulates the Performance of Odor Discrimination Task." *Experimental Brain Research* 212.2 (2011): 305-314. *PubMed*. Web. 8 Sept. 2015.
Heron Mary and Lambertus Hesterman. "Physiotherapy for Paralysis." *Australian Journal of Physiotherapy*. 20.4 (1974): 175-185. *ScienceDirect*. Web. 15 Oct. 2015.
Houghton, Peter and Melanie Howes. "Plants used in Chinese and Indian Traditional Medicine for Improvement of Memory and Cognitive Function." *Pharmacology Biochemistry and Behavior* 75.3 (2003): 513-527. *ScienceDirect*. Web. 16 September 2015.
Langhorne, Peter, Wagenaar, Robert, and Dr. Cecily Partridge. "Physiotherapy after stroke: More is Better?" *Physiotherapy Research International*. 1.2 (1996): 75-88. *Wiley Online Library*. Web. 3 Dec. 2015.
Manyam, Bala. "Dementia in Ayurveda." *The Journal of Alternative and Complementary Medicine*. 5.1 (1999): 81-88. *Mary Ann Liebert, Inc.* Web. 4 Dec. 2015.
Pandian, Jeyaraj Dural, Gagan Toor, Rajni Arora, Paramdeep Kaur, K. V. Dheeraj, Ranjeet Singh Bhullar, and Padmawati N. Sylaja. "Complementary and Alternative Medicine Treatments among Stroke Patients in India." *Topics in Stroke Rehabilitation* 19.5 (2012): 384-394. *PubMed*. Web. 25 September 2015.
Ross, Ivan. "Medicinal Plants of the World." *Chemical Constituents, Traditional and Modern Medicinal Uses*. 1. 2 (2003): 232-234. *PubMed*. Web. 3 Dec. 2015.
Rossingol S, and Melville Jones. "Audio-spinal Influences in Man Studied by the H-reflex and its Possible Role in Rhythmic Movements Synchronized to Sound." *Electroencephalography and Clinical Neurophysiology*. 41.1. (1976): 83-92. *PubMed*. Web. 17 Nov. 2015.
Shin B and Lee MS. "Effects of Aromatherapy Acupressure on Hemiplegic Shoulder Pain and Motor Power in Stroke Patients: A Pilot Study." *Journal of Alternative and Complementary Medicine*. 13.2 (2007): 247-252. *PubMed*. Web. 24 September 2015.
Thaut, Michael. "Neurologic Music Therapy in Stroke Rehabilitation." *Current Physical Medicine and Rehabilitation Reports*. 2.2 (2014): 106-113. *Springer*. Web. 1 Sept. 2015.
Thaut Michael, Gerald McIntosh, and Volker Hoemberg. "Neurobiological Foundations of Neurologic Music Therapy: Rhythmic Entrainment and the Motor System." *Frontiers in Psychology*. 5.1185. (2015): 1-6. *PubMed*. Web. 22 Oct. 2015.
Wesson, Daniel and Donald Wilson. "Smelling Sounds: Olfactory-Auditory Sensory Convergence in the Olfactory Tubercle." *The Journal of Neuroscience*. 30.8. (2010): 3013-3021. *Society for Neuroscience*. Web. 18 Nov. 2015.

Acknowledgements:

I would like to thank UROP for presenting me with this opportunity, Professor Mary Boyes from rhetoric for providing me with a platform to research a topic I am passionate about. Thank you!