

International Conference on

PHYSICAL EDUCATION, SPORTS MEDICINE AND DOPING STUDIES

August 08-09, 2018 Osaka, Japan

Acute effect of multisensory stimulation on electroencephalography in patients with dementia**Kwan-Hwa Lin and Tsu-Wang Shen**

PT PhD, Department of Physical Therapy, Tzu Chi University, Taiwan

PhD, Department of Medical Informatics, Tzu Chi University, Taiwan

Introduction: Multi-sensory stimulation (MSS), previously known as snoezelen, is usually provided to stimulate the senses through the provision of unpatterned visual, auditory, olfactory and tactile stimuli in a leisure room for people with learning disabilities. Preliminary investigations have suggested that MSS is beneficial for improving cognition, life of quality in people with dementia. However, one leisure room requires large space with sensory modalities which can be expensive. In this study, a portable recliner with MSS was developed.

Objectives: The purpose of this study was to record the brain activity before and after MSS in persons with dementia.

Method: Six old persons living in the long-term care facility with mild to moderate dementia were recruited. The participants were arranged individually to sit on a recliner for 10 minutes. The chair was equipped with music-induced vibration for tactile stimulation and music-induced optic fibers lightening for visual stimulation. The 14-lead electroencephalography (EEG) was recorded before, during and after MSS. The EEG was analyzed by time-frequency Fourier transform. The α wave (8~12 Hz), β wave (12~30 Hz), θ wave (4~8 Hz) and δ wave (0.5~4 Hz) were quantified. The nonparametric Wilcoxon-signed rank test was performed.

Results: The energy of α , β , and θ waves especially in frontal-temporal lobes increased significantly after MSS.

Conclusion & Significance: This was a pilot study, and the preliminary data indicated that the frontal-temporal activities increased immediately after MSS. After musical vibration, the increase in α wave might increase relaxation. The increase in β wave might increase attention to environmental stimulation. Furthermore, the increase in θ wave might be related to subconscious mood change after MSS. Therefore, the change in the brain activities with MSS might be beneficial for persons with mild dementia.

Acknowledgement: The authors thanks the experimental assistance by Houu-Wooi Lim and Hsuan-Yu Hsu, Tzu Chi University. The research grant was supported by Ministry of Science and Technology, Taiwan (MOST 106-2218-E-320-001-).

Recent Publications

1. Baker R, et al (2003) Effects of multi-sensory stimulation for people with dementia. *Journal of Advanced Nursing* 43: 465-477.
2. Ozdemir L, Akdemir N (2009) Effects of multisensory stimulation on cognition, depression and anxiety levels of mildly-affected Alzheimer's patients. *Journal of the Neurological Sciences* 283: 211-213.e
3. Mahboubinia M, et al (2012) The effect of Multi Sensory Stimulation (MSS) on cognitive disturbances and quality of Life of male patients with Alzheimer's disease. *Iranian Rehabilitation Journal* 10: 50-55.
4. Taher AV, Ahmadi MK, Zamir FP (2015) Effects of multi-sensory stimulation on cognition function, depression, anxiety and quality of life in elderly persons with dementia. *International Journal of Sport Studies* 5: 355-360.
5. Yuvaraj R, et al (2014) On the analysis of EEG power, frequency and asymmetry in Parkinson's disease during emotion processing. *Behavioral and Brain Function* 10: 12-19.

Biography

Kwan-Hwa Lin has completed BPT from National Taiwan University and PhD in Physiology and Biophysics from University of Kentucky, USA. Her expertise is in neurological physical therapy, especially in the field of Parkinson disease, spinal cord injuries and the elderly. She is in charge of a Human Motion and Behavior Analysis Laboratory in Tzu Chi University, and has several studies and publications related to gait analysis and motor control. She has received several research grants from government, i.e., The Ministry of Science and Technology, Taiwan, and the results include new inventory patents. She has written the book "Neurological Physical Therapy" in Chinese in 2012, and won "Who's Who in Asia 2012".

khlin03@mail.tcu.edu.tw