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ALPHA WAVE STIMULATION ON COGNITIVE FUNCTION IMPROVEMENT AND CHANGES IN BRAIN MAPPING IN MILD COGNITIVE IMPAIRMENT

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Background: The impact of the development of health technology includes the growing number of elderly people in Indonesia. Based on the 2017 National Statistics Agency (BPS) National Census Data, the number of elderly people is 23.4 million (8.97 percent) of the total population of Indonesia. In 2035 it is estimated at 48.2 million of the population (15.8 percent). It is also involved by interactions with mild cognitive functions and even to dementia, so interventions are needed to improve the quality of life of the elderly. Developing evidence based model for non drugs intervention for cognitive impairment prevention. The Quantitative of Electroencephalography (Brain-QEEG Mapping) can help law enforcement for mild cognitive problems (Mild Cognitive Impairment / MCI) and can increase the progression of health diseases supported by alpha wave stimulation therapy (8-12Hz).

Aims: To examine the effectiveness of alpha wave stimulation in improving cognitive function and changes in brain mapping in vascular MCI compared to non-vascular MCI.

Method: This study is experimental with pretest and post test study design. A population that been used are old age participant of diabetes gymnastics group in Prof. Dr. Soerojo Psychiatric Hospital Magelang. The subjects are 30 people by non-random sampling technique that consists of 18 people participant of vascular MCI and 12 participants of non-vascular MCI. Study instrument that been used is MOCA INA. Before and after the alpha wave stimulation intervention (using the alpha/theta protocol for 10 period in 2 weeks electrode placement on the frontal area), MOCA INA and Brain Mapping were examined on pre and post intervention. The statistical analysis technique used is the F-test and χ^2 -test, with $\alpha = 5\%$.

Result: The result showed significant progress on cognitive enhancement with p value 0,0002 in MCI and p value 0,0003 MCI vascular group. The brain wave also showed some changes particularly in MCI group, they were some significant changes on decreasing slow wave and increasing fast wave.

Conclusion: We can conclude that alpha wave stimulation is effective on enhancing cognitive and improving brain wave for mild cognitive impairment.

Keyword: alpha wave stimulation, brain mapping, mild cognitive function (MCI)

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