

The TTAP Method © an innovative multimodal approach for Alzheimer's Disease created to enhance Cognition and Psychosocial Wellbeing Utilized in Two Pilot Studies with Individuals Diagnosed with Mild and Moderate Alzheimer's Disease.

Research Abstract

Currently, there is a need for strength-based recreation therapy approaches which promote the retention of skills and abilities of those diagnosed with Alzheimer's' disease. These two pilot studies, conducted in 2008, utilized this emerging multi-modal intervention: Therapeutic Thematic Arts Programming for Older Adults (TTAP Method©), an approach which provides stimulation to three distinct brain systems, naturally stimulating person centered programming, encouraging brain wellness and neural regeneration, thereby providing a viable means for enhancing cognitive functioning in those diagnosed with this neurological disorder. Research on TTAP Method© efficacy on those individuals with mild AD at Cornell University is currently being statistically analyzed as this paper is being drafted. Early indications from the Cornell Study indicate that all three pilot studies conducted between 2008-09, strongly indicate that the TTAP Method© may be an effective intervention for slowing the progression of MCI to Alzheimer's Disease. TTAP Method© is person centered, culturally competent, and employs a variety of recreation/art activities.

Overview

The prevalence of MCI in the general population is reported to be as high as 25% for adults 65 years and older,^{1,2,3,4,5} and the progression from MCI to AD per year is reported to be approximately 12% to 14%.^{6,7} Multimodal interventions (a variety of mixed interventions, stimulating all regions of the brain) have proven to be extremely successful in early stages of mild cognitive impairment (MCI)/Alzheimer's disease (AD) for decreasing symptoms.^{8,9} Such interventions are designed to provide a wide variety of stimuli, positively affecting and increasing neuronal activity, responses, and plasticity.^{9,10}

TTAP Method© is a multimodal, art/ recreation process that employs art/recreation interventions within a nine step structure in order to inhibit the progression of MCI to AD.¹¹ The TTAP Method© maximizes interaction among participants, stimulates all aspects of brain functioning, addresses social and emotional needs, and integrates opportunities for life review.¹¹ The TTAP Method© therefore provides the early intervention needed in order to assist older adults in retaining cognitive and psychosocial abilities.^{8,12,13,14}

Methodology

Research on the TTAP Method is rapidly increasing. The first investigation on the TTAP Method© took place at Nazareth College of Rochester with the Hispanic population (Alders, 08).

This study investigated the role of various activities on cognitive performance in a community sample of Hispanic elderly subjects. The primary aim of the study was to examine whether engagement in structured art/recreation activity, such as TTAP Method(c), was predictive of cognitive performance. The research followed a quasi-experiment, pretest/post test format which allowed investigation of the hypothesis that creative activity accounts for positive changes in cognitive functioning. This hypothesis predicts that dynamic, mentally stimulating activity is essential in protecting against cognitive decline associated with age and is positively correlated with cognitive performance.

General procedure: 24 Subjects were interviewed in a Hispanic community center by bilingual interviewers, allowing for culturally sensitive interaction. Information necessary for the evaluation of cognitive functioning was collected in the form of the neurological clock drawing task (Clock Drawing Test- sensitivities: up to .86; specificity: up to .96). The Clock Drawing Test (CDTs) were blindly and independently scored by three raters, using the clock drawing interpretation/scoring system described by Sunderland et al. Participants were also given a pre and post self-report known as the Cognitive Failures Questionnaire (CFQ), pertaining to the frequency of everyday deficits in attention, perception, memory, and motor coordination (CFQ-internal validity: 0.91; test-retest reliability rate: 0.82). Additionally, personal and demographic information was collected at the onset of the investigation, including education, age, gender, country of origin, date of immigration to U.S., and level of social support. Art therapy sessions were provided weekly. The experiment duration totaled 12 weeks.

Participation in creative activity as a factor of cognitive functioning: The statistical significance of the variables was examined using the program SHAZAM ($P < .05$). Dependent variable: Difference in pre/post scores. Independent variable: Number of art therapy sessions attended.

Results:

A total of 8 variables were taken into account. Those variables included: age, country of origin, gender, education level, duration spent in the US, frequency of self-directed art making, living arrangements, and attendance to art therapy sessions.

Only attendance to art therapy sessions was found to have a significant correlation to cognitive evaluation test scores. Correlations among activity and cognitive performance: Cognitive performance scores for both the CFQ and CDT were positively and significantly correlated to participation in art therapy sessions. (The p-values were .010 and .021 respectively).

The second pilot studies were conducted by fourth year students at St. Thomas Aquinas College at Bergen Regional Medical Center, the Alzheimer's locked Unit.

These two studies investigated the subjective responses to the TTAP Method vs. daily recreation therapy sessions. The primary aim of the study was to examine four overall questions 1) Did individuals feel the TTAP sessions increased their overall feelings of quality of life? 2) Did the sessions positively affect their personal needs? 3) Did the sessions enhance verbalization? 4) Does the TTAP Method naturally increase opportunities for cognitive stimulation in programming?

This research study followed an experimental design. Each TTAP Method session was followed with post session questions from the Farrington Leisure Evaluation Scale (adapted for this research study). This format allowed investigation of the hypothesis that those individuals with moderate AD could evaluate and give feedback regarding their likes and dislikes of the

multimodal art/recreation activity. This hypothesis predicts that dynamic, mentally stimulating multimodal approach is essential at any stage of the disease process and can have an overall affect on psychosocial wellbeing, increased verbalization and enhance cognitive stimulation.

General Procedure conducted for Bergen Regional Medical Center: 4 students were assigned to 6 residents (consent forms were administered through legal guardians with IRB approval) diagnosed with moderate levels of Alzheimer 's disease. For seven weeks students meet with the same 6 individuals, and designed a different multimodal TTAP Method session each week for 1 ½ hours. At the end of each session students utilized a modified version of Farmington's Leisure Evaluation Scale (using 1-5 Lickert Scale) and open ended questions, to attain responses from the participants regarding "their voice" in the overall evaluation of each session. The results were tabulated by the students as part of the Research Methods Course in Therapeutic Recreation at St. Thomas Aquinas College, using SPSS software for data analysis.

Results:

Question 1: Findings demonstrated high levels of self satisfaction throughout the 7 sessions rating at 4.85 out of 5. Question 2: The TTAP Method was shown to had a direct effect on residents feelings of needs being met with a 4.9 rating. Question 3: The TTAP Method was shown to increase verbal interactions through both by the students' subjective observations and open ended questions that the residents answered. Question 4: The TTAP Method was found to increases multiple opportunities for stimulation cognition through student observations and residents open end responses which will be discussed in detail.

Implications:

The TTAP Method© is an innovative and viable multimodal recreation/art therapy method for slowing the progression of AD. It is rapidly being incorporated into various research projects in New Zealand, Finland, Australia and the United States due to the fact that it lends itself to systematization while at the same time providing person centered individualized care. The TTAP Method© was developed out of current growing neuroscience research which demonstrates that the life experiences and activities that challenge the mind in a safe and socially validating person centered way result in positive and continuous changes in the human brain, even in the individual with Mild AD, Moderate AD or advanced stages. Therapeutic Thematic Arts Programming – the TTAP Method© incorporates activities that have shown to be emotionally meaningful which has been researched to demonstrated that our cognitive abilities to recall are enhanced if accompanied by a positive emotional event¹⁵. Therapeutically stimulating activities directly enhancing the neuroplasticity of the brain, specifically in the hippocampus region. The TTAP Method© engages participants in a group or individual art/ recreation therapy format which ensures a higher likelihood of full participation from each participant by providing nine steps that accommodate all known information processing styles. Most significant to the therapist serving this ever growing special population is that a wide variety of data sources demonstrate that the recreation/ arts have a positive impact on quality of life. Factors associated with quality of life include but are not limited to; self expression, self-worth, increased socialization, feelings of belonging to something greater, ability to self challenge themselves, and meaningful quality time.^{16,17}

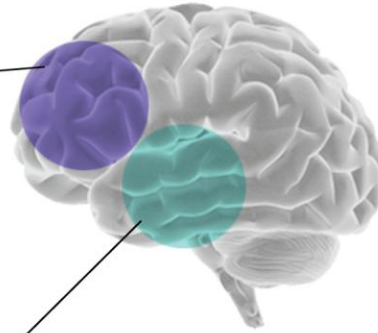
It is my hope that by October, I will be able to additionally add to the discussion the results of the Cornell University and Weil Medical Center outcomes of 8 participants living in the community

diagnosed with early onset AD.

Protocol One: Meditation and Music

Frontal cortex-

Meditation has been shown to improve memory loss and strengthen the prefrontal cortex in a study of 20 individuals diagnosed with mild Alzheimer's disease conducted at University of Pennsylvania in 2007 (Singh Khalsa, D.S., 2007). Meditation in the normal brain has been found to be associated with increased cortical thickness in individuals who meditate (Lazar et al.2005).



Right temporal lobe-

Listening to music has been found to be both emotionally calming and shows decrease in agitation behaviors in a number of studies (Woods, P., & Ashley, J., 1995; Perrin, T., 1997; Protheroe, L., 1999; Peak, J., & Cheston, R.I.L., 2002; Cheston, R. et al., 2007).

Protocol Two: Oil Pastel Drawing, Meditation and Music

Frontal lobes-

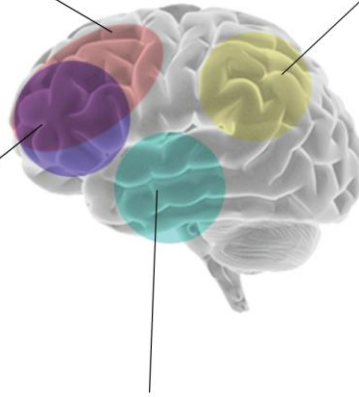
Stimulated when drawing, showed significant and distinct differences in the drawings from individuals diagnosed with frontal lobe degeneration (FTLD). Research shows overall tendency to have more disordered composition, less active mark making and less details (Rankin et al., 2007). Additional research by Crutch & Rossor (2006) demonstrates the use of muted color as the disease progresses through A.D. process.

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Parietal lobe-

Responsible for the processing of cognitive and spatial information, such as where to start drawing a line, the length of the mark on the page and the overall representation of an image. http://www.ninds.nih.gov/disorders/brain_basics/brain.



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Protocol Three: Wreath Sculpture, Meditation and Music

Frontal lobes-

This area is also stimulated when planning, and using imagination. The frontal lobes seem to act as short term memory storage centers, allowing ones idea of where to place leaves or berries on a wreath. Stimulation of this region is being studied correlating to increase memory ability in early to mid- Alzheimer's disease. (Hamidi, M., Tononi, G., Postle, B.R., 2008)

Posterior parietal lobes-

Memory of repeated use of fine and gross coordination when engaged in activities, such as sculpture, has been shown to enhance memory strength. Research demonstrating that the right side of the brain, where creativity lies is less damaged through the disease process which enables continued participation (Wiesmann, M. & Ishai, A., 2008).

Prefrontal cortex-

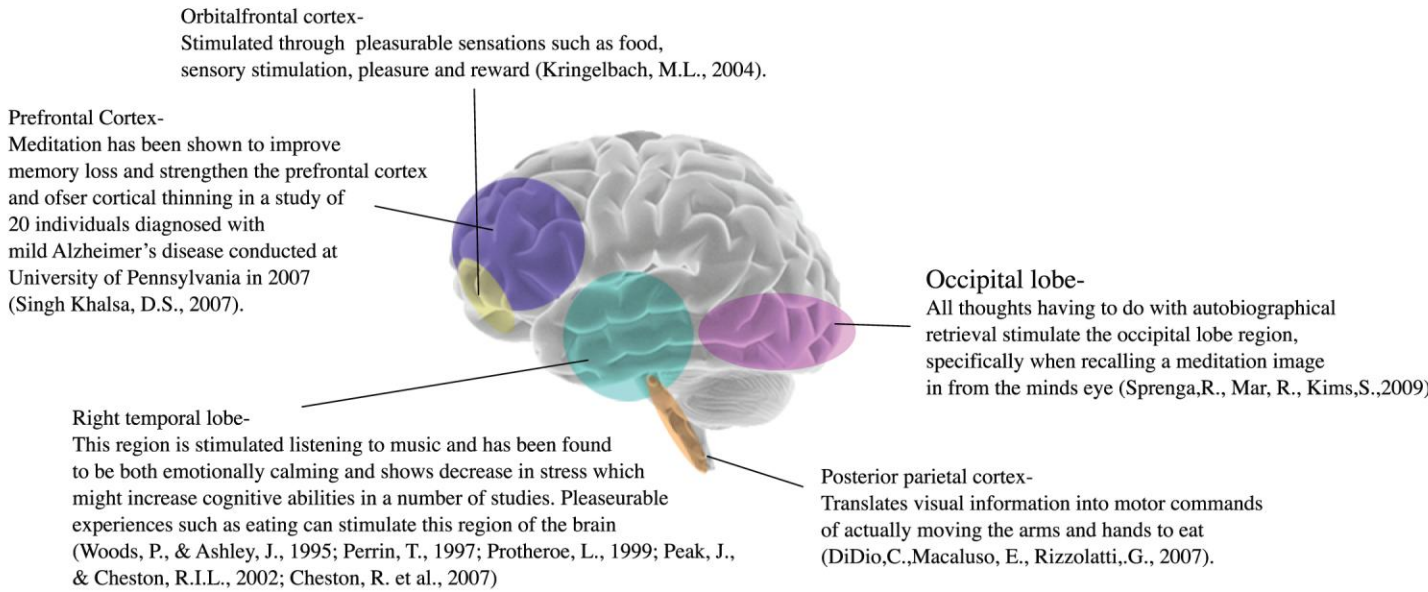
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Protocol Seven: Meditation, Music and Food event



Protocol Four: Meditation, Music and Mask Making

Frontal lobes-

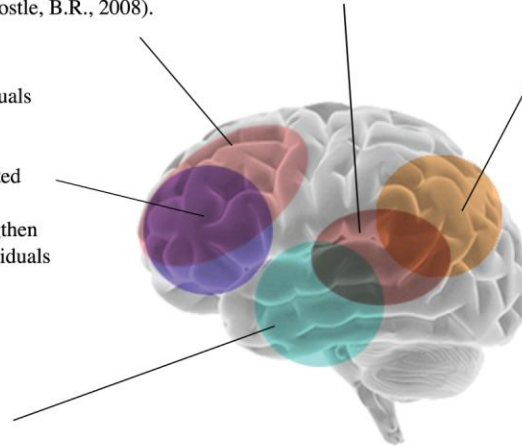
This area is also stimulated when planning, and using imagination. The frontal lobes seem to act as short term memory storage centers which can be stimulated through the process of a mask making art task. Stimulation of this region is being studied correlating to increase memory ability in early to mid- Alzheimer's disease (Hamidi, M., Tononi, G., Postle, B.R., 2008).

Temporo-parietal regions-

This region has been shown to be active when focusing on "self" and "self reflection". Thus, active meditation and participation in a mask making project can be closely correlated to stimulation in this region of the brain (Saxe et al., 2006).

Prefrontal cortex-

In researching the brain activity in individuals when asked to think about themselves and self reflection, it was found that the prefrontal cortex was consistently stimulated (Saxe et al., 2006). Meditation has been shown to improve memory loss and strengthen the prefrontal cortex in a study of 20 individuals diagnosed with mild Alzheimer's disease conducted at University of Pennsylvania in 2007 (Singh Khalsa, D.S., 2007).



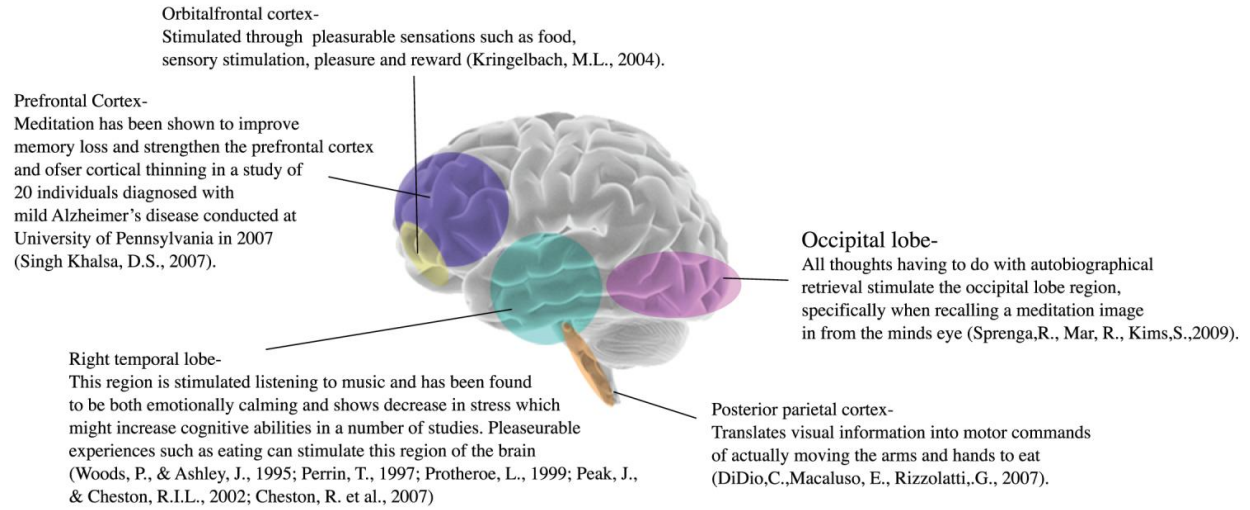
Posterior parietal lobes-

Memory of repeated use of fine and gross coordination when engaged in activities, such as painting a mask, has been shown to enhance memory strength. Research demonstrating that the right side of the brain, where creativity lies is less damaged through the disease process which enables continued participation (Wiesmann, M. & Ishai, A., 2008). Involvement in therapeutic activities has been significantly correlated to increased cognition in those diagnosed with mild Alzheimer's disease (Levine Madori, 2005, 2007, 2009; Alders, A., & Levine Madori, L. in print).

Right temporal lobe-

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Protocol Seven: Meditation, Music and Food event



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