

Enhancing mood, relaxation and memories through the TTAP[®] approach in residents with MCI

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Abstract

This paper describes a pilot study conducted at an independent senior living center with residents suffering from Mild Cognitive Impairment (MCI). This 7 week quasi-experimental, pre-post design was implemented. For the 7 week period, students for St. Thomas Aquinas College were randomly assigned to residents who are diagnosed with early onset Alzheimer's disease. The pre and post questions are designed to measure the residents' moods, memories, socialization and relaxation. The results of the study indicated an important correlation of participation in TTAP Method[®] programming which uses a meditation prior to each activity to enhance the resident's feelings of increased memory abilities, mood enhancement and overall feeling of relaxation.

Introduction

This is both a qualitative and quantitative study that is based on verbal self-expressive questions. All questions are asked in response to the use of the Therapeutic Thematic Arts Programming (TTAP Method[®]), which is an approach that provides stimulation to three distinct brain systems, encouraging brain wellness and neural regeneration, thereby providing a variable means for enhancing cognitive functioning in older adults [1,2]. The TTAP Method[®] has a twelve-step intervention that directs the focus of therapy on proven factors in helping cognition: the reinforcement and utilization of remaining strengths, for example, accessing long-term memory, or controlling motor coordination [1,2]. This method has specific direct therapeutic interventions that through the stimulation of different regions of the brain, can strengthen cognition while retaining their remaining strengths [3]. The TTAP Method[®] has proven to have many therapeutic benefits coming from the arts, including language, communication, music, dance and drama [2] along with the physiological effects on the brain by stimulating the different regions of the brain through various activities [2]. This study's findings support the clinical research originally done in 2005, 2007, 2010, 2011, 2012, 2013 and 2014. The results from these studies have overall showed a significant relationship between active participation in the therapeutic activities and leveling of cognition functioning and psychosocial wellbeing [4]. The TTAP[®] approach enhances interaction through stimulation which positively increases neuronal activity, responses, and plasticity and addressing social, emotional and cognitive needs [1,3].

Overview: It is estimated that about 5.1 million people in America alone, have Alzheimer's Disease. Alzheimer's Disease is a progressive disease that decreases brain function and results in chronic memory loss and confusion. This is increasing in the aging population and this disease is projected to double between 2010 and 2050. This makes 20% or 88.5 million people in America having or developing Alzheimer's Disease [5]. Early Symptoms of Alzheimer's Disease include finding it hard to remember things, getting lost and losing things or putting them in odd places [6]. Later signs of Alzheimer's Disease are forgetting how

to brush one's teeth, wandering away from home, and being confused about people, time and places [6]. Researchers have studied how stimulation of the brain can slow down cognition. Staying cognitively active through socialization and intellectually are associated with lower risk of developing Alzheimer's Disease [7] Activities to decrease the risk of developing Alzheimer's Disease such as crosswords, volunteering, reading newspapers, establish the brain's "cognitive reserve," or the brain's ability to operate effectively even when it is damaged or some brain function is disrupted [7,8]. Those who have Mild Cognitive Impairment (MCI) are also in a greater risk for Alzheimer's Disease. After a 2.5 year follow up period in a study with 221 participants with MCI and 565 with cognitive impairment, 57 people who had MCI 25.8% developed Alzheimer's Disease, making it a 6.7 higher risk for those who have MCI compared with cognitive impairment to develop Alzheimer's Disease [9]. The estimated rate of people with MCI who develop Alzheimer's Disease is 10-15% a year [10]. In a recent 32 systematic review, an average of 32 percent of people who had MCI got Alzheimer's within 5 years [11].

This study was conducted in Dowling Gardens located in Sparkill, New York for a seven-week period. The TTAP Method was implemented with 10 geriatric residents of the independent living home who had signs of early Alzheimer's Disease. Students studying Therapeutic Recreation at St. Thomas Aquinas College were randomly assigned to a resident. Those residents in this study were chosen by the senior living staff because they were showing symptoms of withdrawal

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from socialization and lack of participation from daily activities. Out of the ten residents, nine were Caucasian female and one was a Caucasian male. The mean age was 85. The twelve step TTAP Method® structured each session of the seven weeks. The seven sessions were interrelated with the twelve steps of the TTAP Method®: Meditation and drawing, meditation and sculpture, meditation and movement, meditation and poetry, meditation and theme event, meditation and phototherapy, meditation and sensory stimulation, meditation and drama therapy, meditation and food or cooking [12]. Each step stimulates a different part of the brain and in doing so strengthens cognition and psychosocial abilities (Table 1). One of the main goals is to increase the time of the sessions from 30 minutes a session to more than an hour sessions (Graph 1). The longer the sessions the more stimulation of the brain and cognition which overall increases the resident’s quality of life.

Data collection

Prior to each session, the residents and family members completed consent forms to participate in this study. They also had the option to attend each week or nonattendance along with the freedom to withdraw from this study at any time.

This study collected both objective and subjective data which includes data from each session average score from pre-and post-questions along with verbal responses. The data from the pre-and post-questions were collect at the beginning and end of each session. It was based off a five point Likert Scale, five being the highest and 1 being the lowest. The pre session questions involved one social question: 1) How would you rate your daily interactions thus far? one memory question:

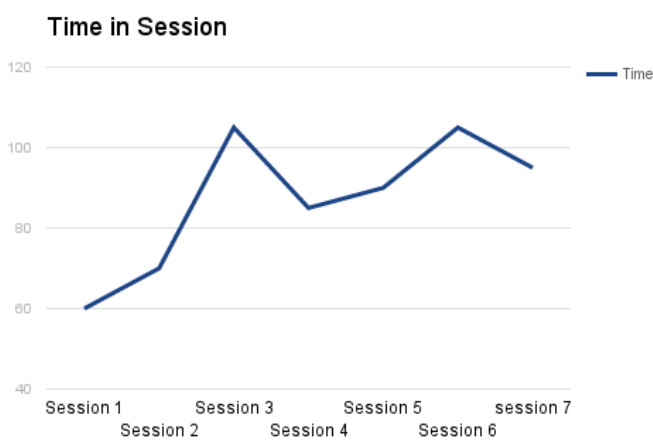
1) Did you recall any memories from your past today?, a relaxation question: 1) How relaxed are you right now?, a cognitive question: 1) Have you learned something new today and one mood question: 1) How has your mood been today?. The post-session questions also involved one social question: 1) How would you rate your daily interactions thus far now? one memory question: 1) Did this activity bring up any old memories, a relaxation question: 1) How relaxed are you after this activity?, one cognitive question: 1) Did this activity make you learn something new?, and one mood question: 1) How is your mood after this activity?. This is a qualitative study without the use of a control group. The data collected supports previous studies and findings within the field of Therapeutic Recreation along with the objectives of the TTAP Method® (Table 2).

Objectives of the TTAP Method®

This method encompasses five main objectives. The first objective is to embrace the *use it or lose it* concept by stimulating all areas of the brain to enhance cognitive, emotional, physical, and social capacity. Secondly, to provide opportunities for the individual to integrate life experiences into group experiences through object relations in the creative arts process. Thirdly to provide a system in which the individual can reintegrate into a supportive social group to foster feelings of safety and support and thereby increase social participation. Fourthly, to engage in participant in a multitude of creative arts experiences: music, drawing, sculpture, movement, poetry, and special theme events. Lastly to provide programming that enables the *flow* to flourish [1]. The TTAP Method® also has fundamental concepts related to the Accountability Model of Service. The concepts of functional intervention, leisure education, and recreation participation, all of which are critical for leisure satisfaction and enjoyment [2]. This method provides the participant with the opportunity to believe he or she is in control of and contributing to events and activities [2].

Stimulate optimal brain function

Although there is no known cure for Alzheimer's Disease, research has been done on brain plasticity, neural regeneration and cognitive reserve in Alzheimer’s patients that demonstrate the positive changes that can be activated through visual, auditory, and sensory stimulation [1]. Though the use of the TTAP Method® participants will be provided with visual, auditory, and sensory stimulation [1,2]. A study was conducted at Nanyang Technological University in Singapore, to look at the effects of DBS, or Deep Brain Stimulation, where it targeted the ventromedial prefrontal cortex. It showed that after constant stimulation to the part of the brain responsible for a higher level of cognitive function, saw increased memory. Also, there



Graph 1. As illustrated in graph 2, the time spent in programming naturally increases to 60 minute sessions to over 100 minute sessions.

Table 1. Shows the twelve steps of the TTAP Method®, their progression, what stimulation is presented during each step, and the brain region that is being stimulated throughout the session.

Step	Process	Stimulation	Brain Region
1	Individual thought to group ideas	Linguistic	Broca's Region
2	Group ideas to music/ guided imagery	Musical/ Visual	Visual/ auditory cortex
3	Music/ Guided Imagery to 2D sculpture	Visual	Temporal
4	Image into 3D image/sculpture	Spatial	Parietal/ Occipital
5	Sculpture into movement	Kinesthetic	Motor cortex
6	Movement into word/poetry/stories	Linguistic	Frontal Lobe
7	Words into food for thought	Spital	Sensory cortex
8	Food for thought into phototherapy	Intrapersonal	Reticular Formation
9	Phototherapy to themed event	Interpersonal	Broca's/ Wernicke's area
10	Sensory Stimulation	Kinesthetic	Sensory Cortex / Parietal
11	Drama Therapy	Kinesthetic/ Music	Temporal Lobe
12	Evaluation and Feedback		

Table 2. The data collected supports previous studies and findings within the field of Therapeutic Recreation along with the objectives of the TTAP Method®.

Age	Gender
84	Female
88	Female
81	Female
84	Female
87	Female
84	Female
91	Female
83	Female
89	Female
78	Male

were new neurons being formed in the brain [3,13]. The findings of this research show that the potential of enhancing the growth of brain cells using DBS, meaning that new brain cells can be created [13]. The TTAP Method® will bring stimulation to the brain in the affective system, strategic system and the recognition system [3]. Integrated in the TTAP Method® is the Bloom's Taxonomy of Learning (1956) as it pertains with higher forms of thinking which need to be increased with those who have Alzheimer's Disease [14]. The disconnection of the prefrontal cortex and the hippocampus in Alzheimer's patients suggest that memory breakdown is related to the decreased integration of activities that work with these regions of the brain [15]. By stimulating all types of learners with the TTAP Method® increases participation therefore having a protective effect on the hippocampus [3]. Through technological advances in modern medicine, there is a new understanding developing about the brain's functioning and and it's ability to regrow cells in the hippocampus and the amygdala [2].

Social needs

Research has shown that strong social ties are significantly less likely to display cognitive decline compared to those who are isolated or have weak social ties [16]. The *use it or lose it* concept not only pertains to the TTAP Method® but also to our social and physical wellbeing [2,16]. The lack of social interaction has a direct relationship with cognitive decline and on the hippocampus, making it more difficult for those who have Alzheimer's to use their short term memory and language abilities [2]. By social interaction, the brain is able to use its brain reserve which makes the brain function despite damage to the brain. Research has shown that those who social more survive up to 20 percent longer compared to those who have isolated lives. For those who have an isolated life, they are more than twice at risk for developing dementia or other cognitive disease [17]. Those who have a strong social connection can reduce the risk or onset of Alzheimers [16]. The TTAP Method® has a direct person centered approach that naturally enhances feelings of self-worth. This has a direct correlation towards creating social groups and support systems [2,3]. Socialization is fundamental in the well-being of an aging individual.

Emotional needs

Emotions prepare the body for action, guide decisions, and what needs action and what needs to be remembered [18]. Older adults are more likely to get out of a negative state of mind compared to younger adults even though they have a decrease of social ties, health, cognitive agility. Older adults are better at regulating their emotions although there are still some unknowns. Many older adults suffer from depression which is combined with feelings of hopelessness [3]. Many older adults with Alzheimer's have depressive mood, anxiety hallucinations, delusions or apathy [19]. In Csikszentmihaly's (1990)

theory of flow is shown through the TTAP Method®. The flow allows optimal human experience and gives control back to the individual. The nine characteristics that can be accomplished in the TTAP Method® are clear goals, feedback regarding process, exercise of skill, intense concentration, diminished awareness of mundane concerns, a sense of control, a loss of self-consciousness, altered sense of time, and enjoyment of the experience for its own sake [2]. The emotional support of having the independence to make their own creative abilities can help individuals overcome difficulties the individual may be facing. The TTAP Method significantly alleviate cognitive impairments and overall improvement in individual functioning [3].

Communication needs

One of the effects of Alzheimer's is the diminution of the ability to communicate [20]. Communication is a key function to be able to live independently and for socialization. With communication decreasing with age and due to Alzheimer's disease, the life consequences of this can be avoidance of social situations which can cause a decline of self-confidence, anxiety and depression. [3,21]. The late stages of Alzheimer's disease have shown loss of verbal communication making the individual go from an independent person to a total dependent to others around them and blind to reality. Elder speak, which is a type of speech that is given to those in many healthcare settings [21-23]. The is a deterioration of speech even from early onset of the Alzheimer's so it is important to clarify and sometimes simplify words or phrases as to not upset or frustrate the individual [2]. Since speech is important in maintaining social roles, and not being able to leads to depression and lower self-esteem, the TTAP Method® will be sensitive to the loss of communication and make sure there is no communication breakdown causing frustration for the individual.

Discussion

By using the TTAP Method® all aspects of life were increased. The participants regularly said how happy coming to the program makes them and how they feel more relaxed each time they come. The TTAP Method® made social interaction easy in the group settings and many would often sit the the waiting room talking to each other before the session. As the weeks went by, residents would make sure they would sit next to each other during the program. This study made them use their cognitive reserve which enhances efficient brain stimulation [2]. With the use of the TTAP Method® all learning styles were used to provide opportunities and participation, and full expression of self. The change the chain reaction of an individual from being independent to being diagnosed with Alzheimer's and having memory loss, depression, and lack of interest in activities, the TTAP Method® will enhance the feelings of self-worth and self-esteem which will then lead to an increase motivation to participate and socialize while decreasing isolation and anxiety. Through the group sessions of this seven-week study, it is clear that the TTAP Method® has been emotionally meaningful and therapeutic stimulating [1]. It incorporates the life in order to promote memory retention, perceived social values of self, decreased disorientation, reduced fear and anxiety, and improved self-esteem and social interaction [3].

Results

Over the seven-week period, students collected gathered data that correlated to the five psychological domains of social, memory, relaxation, cognitive and mood. The students created a rating for each of the seven sessions. The mean rating for each session is shown below which compare the before session and after session ratings. The mean

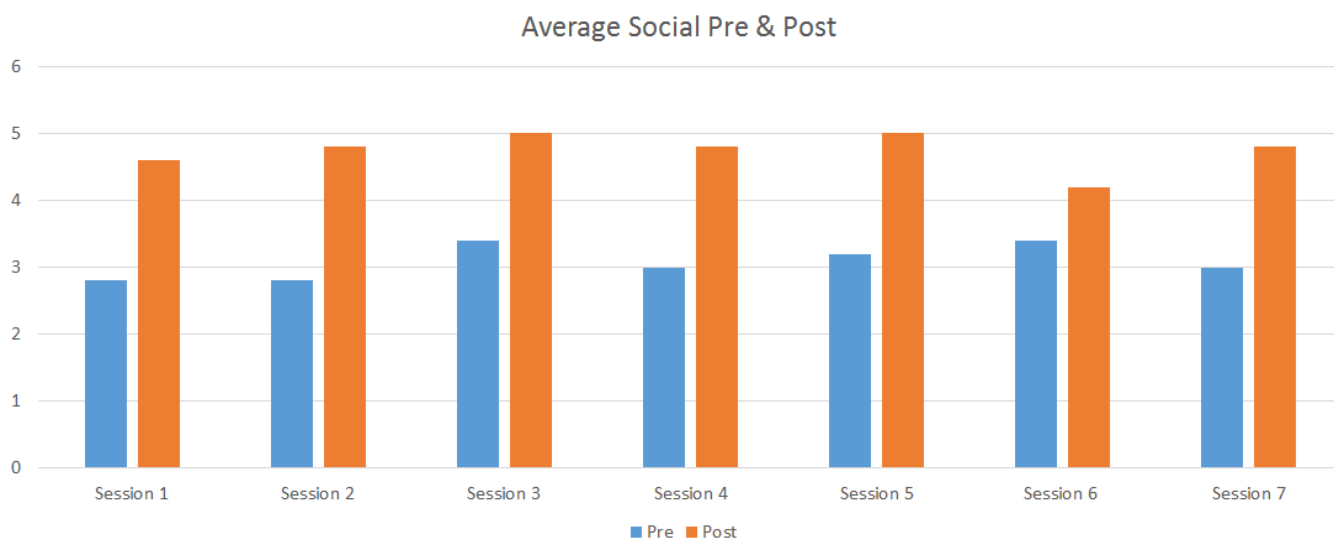


Figure 1. Average Social Pre and post.

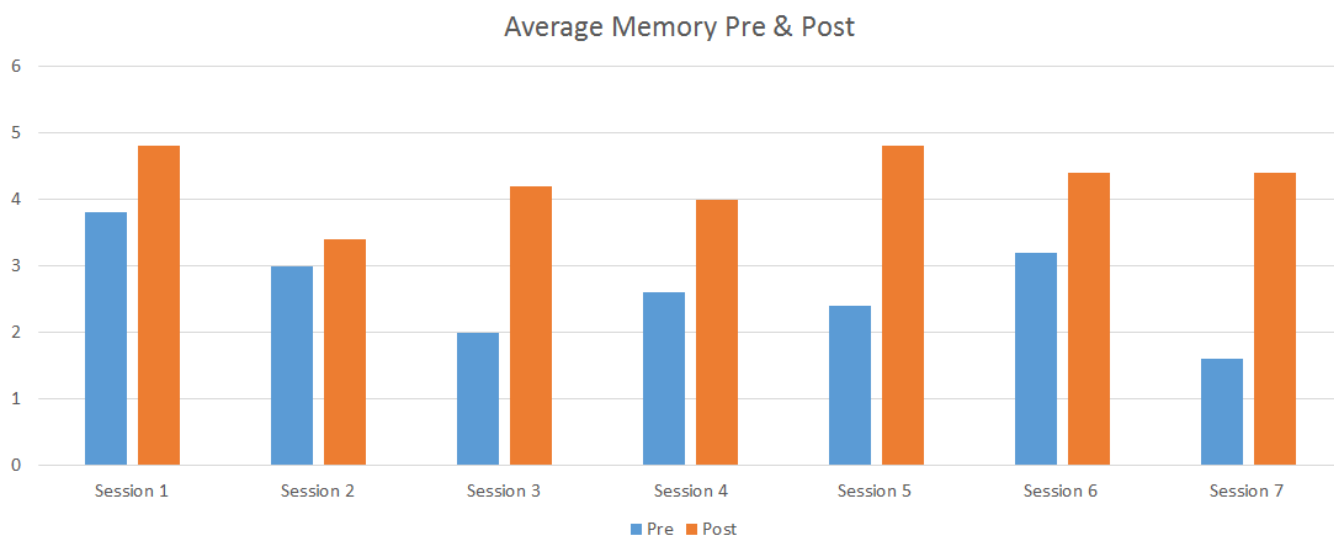


Figure 2. Average Memory Pre and post.

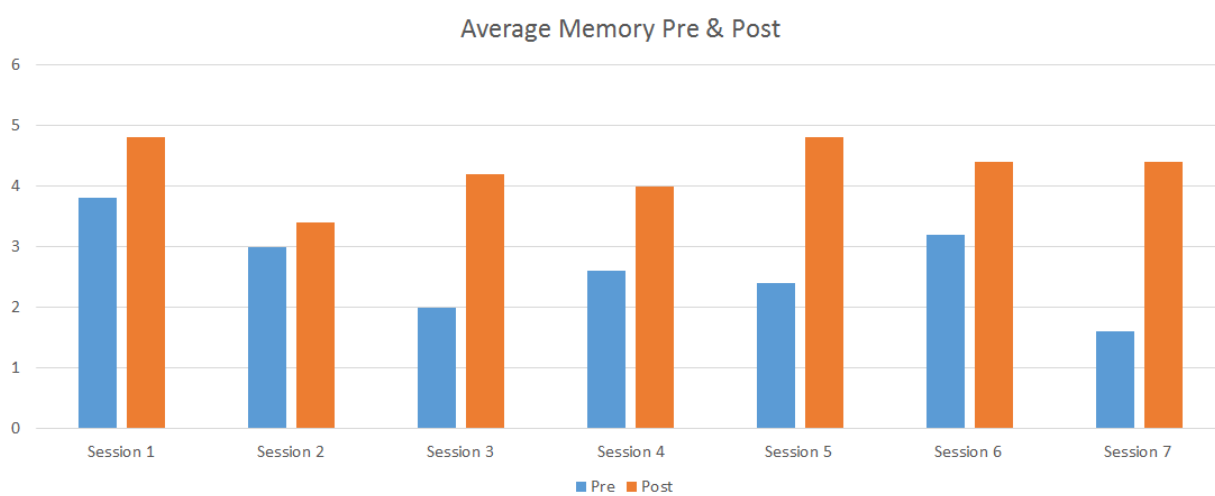


Figure 3. Average relaxation Pre and post.

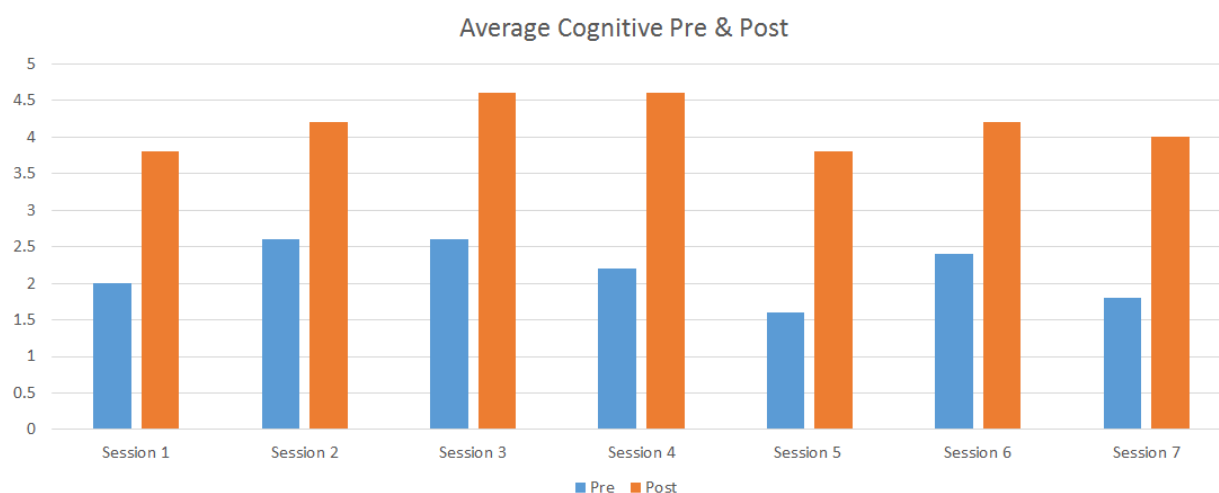


Figure 4. Average Cognitive Pre and post.

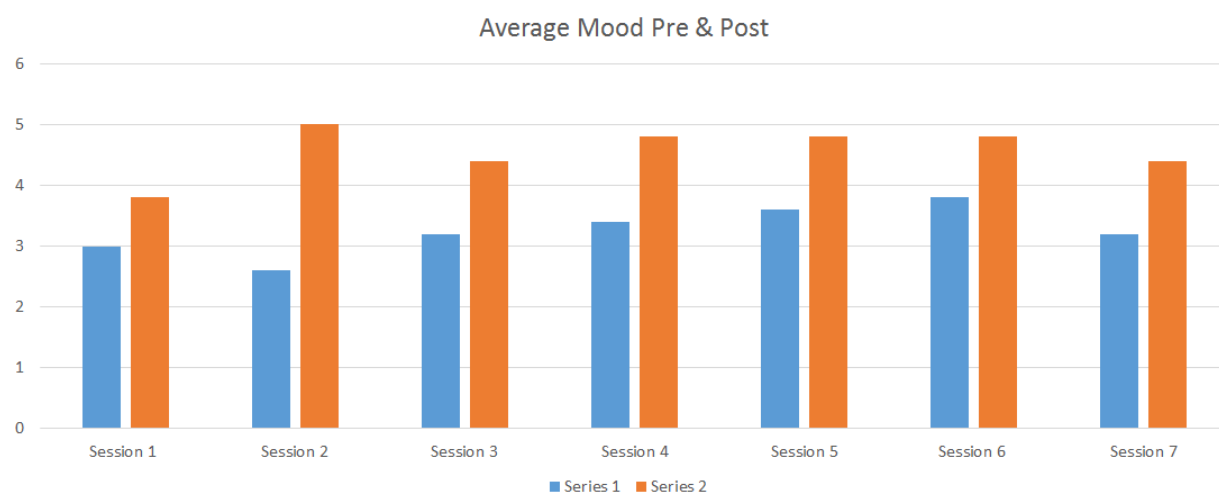


Figure 5. Average Mood Pre and post.

for social was a averaged low of 2.8 for pre and an averaged high of 5 for post. The memory average low for pre- was 1.6 and the average high for post was 4.8. The mean for relaxation pre-session was a low of 3 and the post session average high of 5. The mean for cognitive pre- session was a low of 1.6 and a high of 4.6 for post session average. The low for the premood session was a 2.6 and a high of 5. Social, relaxation and mood were big factors in this study as they increased the most. These 10-individual's quality of life has increased due to the TTAP Method® and the structured programming it has. In addition to the data collected on the positive progress these individuals have had, the students also collected the time in session. The first session lasted 60 minutes and as weeks went on, programming lasted to more than 105 minutes. The times deviated due to the different activities each student chose and how much the participants participated in that group session. The TTAP Method® aided in the natural increase of time spent in each session while also increasing the individual's socialization, memory skills, relaxation, cognitive and mood despite the presence of Alzheimer's. Each student found that additional benefits were present in each session in addition to the ones collected. Most participants found each session exciting and brought happy emotions. The residents looked forward to each week and we're always excited to know that the students would be back the following week.

Some comments were collected when the residents were reflecting on one's works and a comment was made from one resident stating "I feel very comfortable doing this" and "I feel very relaxed". In a different session, comments were made that one resident "loves coming to the program" and another said that this activity "reminds of my favorite people in the word, my mother, husband and children". The comments and the results of this study show how people with Alzheimer's can have a positive and high quality of life. Below are graphs indicating the mean rating for pre and post questions each session (Figure 1-5).

References

1. Madori LL (2009) Uses of therapeutic thematic arts programming, TTAP Method®, for enhanced cognitive and psychosocial functioning in the geriatric population. *American Journal of Recreation Therapy* 8: 25-32.
2. Madori L (2007) Therapeutic Thematic Arts Programming for Older Adults. Health Professions Press. Baltimore, USA.
3. Melville L (2016) Meditation and TTAP Method ® with Residents Diagnosed with Early Stage Alzheimer's Disease. *Journal of Alzheimer's Parkinsonism and Dementia* 1: 1-5.
4. Madori L, Alders A (2010) The Effect of The TTAP Method on Cognitive Performance in Hispanic Elderly. *Journal of American Art Therapy Association* 3: 1-18.
5. Alzheimer's Foundation of America - Alzheimer's Disease Statistics (2016). Retrieved

- November 05, 2016, from <http://www.alzfdn.org/AboutAlzheimers/statistics.html>.
6. National Institute on Aging (2016) The Leader in Aging Research. (n.d.). Retrieved November 12, 2016, from <https://www.nia.nih.gov/alzheimers>.
 7. Preventing Alzheimer's Disease: What Do We Know? National Institute on Aging." U.S National Library of Medicine. September 2012. Accessed November 12, 2016. <https://www.nia.nih.gov/alzheimers/publication/preventing-alzheimers-disease/search-alzheimers-prevention-strategies/>.
 8. Scarmeas N, Stern Y (2004) Bilingualism and Cognitive Reserve: A Critical Overview and a Plea for Methodological Innovations. *Curr Neurol Neurosci Rep* 4: 374.
 9. Boyle PA, Wilson RS, Aggarwal NT, Tang Y, Bennett DA (2006) Mild cognitive impairment: risk of Alzheimer disease and rate of cognitive decline. *Neurology* 67: 441-445. [[Crossref](#)]
 10. Janoutová J, Janout V, Sery O, Hosák L (2015) Is Mild Cognitive Impairment a Precursor of Alzheimer's Disease? Short Review. *Central European Journal of Public Health* 23: 365-367.
 11. Alzheimer's Association (2016) Alzheimer's disease facts and figures. *Alzheimers Dement* 12: 459-509. [[Crossref](#)]
 12. By Mayo Clinic Staff Print (2015) Alzheimer's disease. Retrieved November 05, 2016, from <http://www.mayoclinic.org/diseases-conditions/alzheimers-disease/home/ovc-20167098>
 13. Ristau S (2011) People Do Need People: Social Interaction Boots Brain Health in Older Adults. *Journal of the American Society on Aging* 35: 70-76
 14. Diament M (2008) Friends Make You Smart. *AARP Bulletin*.
 15. Alissa S (2016) Benefits of Deep Brain Stimulation for Alzheimer's". *Alzheimers.net*.
 16. Clark D (2015) Bloom's Taxonomy of Learning Domains. Retrieved November 21, 2016, from <http://www.nwlink.com/~donclark/hrd/bloom.html>
 17. Grady CL (2016) Altered brain functional connectivity and impaired short-term memory in Alzheimer's disease *Oxford Journals* 124: 739-756
 18. Ristau S (2011) People Do Need People: Social Interaction Boosts Brain Health In Older Adults. *American Society of Aging* 7: 70-76.
 19. Diament M (2008) Friends Make You Smart. *AARP Bulletin*.
 20. Mather M (2012) The emotion paradox in the aging brain. *Ann N Y Acad Sci* 1251: 33-49. [[Crossref](#)]
 21. Oude MW, Tilborg, Kessels, Roy PC (2015) Perception of Emotions in Mild Cognitive Impairment and Alzheimer's Dementia: Does Intensity Matter? *Translational Neuroscience*.
 22. Friedman R, Tappen RM (1991) The effect of planned walking on communication in Alzheimer's disease. *J Am Geriatr Soc* 39: 650-654. [[Crossref](#)].
 23. Yorkston KM (2010) Communication and Aging. *Phys Med Rehabil Clin N Am* 21: 309-319.