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## A Sensory-Based Program to Enhance Occupational Performance for Dementia

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This thesis, written under the direction of the candidate's thesis advisor and approved by the program chair, has been presented to and accepted by the Department of Occupational Therapy in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy.

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**A Sensory-Based Program to Enhance Occupational Performance for Dementia**

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A Culminating Capstone Project in Partial Fulfillment of the Requirements for the  
Degree of Master of Science in Occupational Therapy

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## Abstract

Dementia is a neurological disease, causing behavioral and cognitive symptoms, that progressively impairs an individual's ability to engage in meaningful activities. Progressive deterioration associated with dementia impacts occupational performance and independence and quality of life. Sensory based interventions, such as drumming groups, have been hypothesized to be a non-pharmacological intervention for individuals with dementia. The purpose of this study was to analyze the effects of a sensory based intervention program, in this case participation in a drumming group, on functional engagement during self-feeding for individuals with dementia. Researchers gathered data over the course of two days using the Functional Behavior Profile, Self-Feeding Questionnaire, Visual Analog Scale, and the Agitated Behavior Scale as outcome measures. The first day was a baseline day, during which participants did not participate in the drumming group. Researchers completed observational questionnaires measuring the participant's agitation and mood prior to lunch, and during lunch. On the second day, the participants engaged in the drumming group. Agitation, mood, and function was observed before and after the drumming group, and during lunch. Mood was elevated and increased engagement was observed during the drumming group. The effect of the drumming group did not carry over into self-feeding. There was a 20-minute wait period in between the drumming group and lunch time, which may have affected the results. Recommendations for future research include the evaluation of arousal and engagement during the drumming group and its effect on occupational performance.

*Keywords:* Dementia, Sensory-based program, Performance in occupations, Drumming group, Engagement

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## Introduction

Dementia is a neurological disease characterized by cognitive degeneration and a gradual progressive decline in function, decreasing a person's ability to engage in activities that bring meaning into their lives, and eventually deteriorating a person's functional ability to being dependent in all areas of occupational life (Pendleton & Schultz-Krohn, 2013). Dementia affects more than 44 million people worldwide, and 5 million people in the United States. The dementia population is predicted to triple to over 16 million in the United States by the year 2050 (Prince, Guerchet, & Prina, 2013).

A basic tenet of occupational therapy is the importance for individuals, including those with dementia, to engage in occupations that are meaningful to them and to participate in these occupations at as high a level of function as possible. However, individuals with dementia experience progressive memory loss and cognitive disabilities, which interfere with the ability to think and engage in activities (McKeith & Cummings, 2005). In treating individuals with dementia, treatment and symptom management is often a pharmacological approach. While the use of pharmaceuticals (anti-psychotics, antidepressants, anti-anxiety medications) is an effective solution to managing behaviors and psychological symptoms, more holistic and therapeutic treatment approaches are under-utilized. Among non-pharmacological treatment options, approaches that have been shown to help manage behavioral symptoms include participating in a sensory-based program, such as music therapy and drumming groups (Champagne, 2003). Therefore, the objective of this study is to investigate whether a sensory-based program is associated with improvement in behavior, agitation, and mood for individuals with dementia, and

whether this improvement is associated with improved functional performance when self-feeding.

## **Background**

### **Dementia: A Neurocognitive Disease**

Dementia is a chronic condition that is characterized by multiple cognitive deficits including impairment of memory. As the disease progresses, a person with dementia loses language, perception, thinking, judgement, communication, and self-care. Dementia has three stages of progression: early, middle, and late (Stages of Alzheimer's, 2017). Early stage is characterized as a mild cognitive decline, where the patient has mild problems with memory and can still function independently. The middle stage is when the person has moderate memory loss and performance of daily occupations is significantly deteriorated. The late stage of dementia is the most severe stage, in which the person loses all progressive memory, demonstrates behavioral and psychological symptoms, and is unable to perform daily occupations (Stages of Alzheimer's, 2017).

### **Dementia: Behaviors and Symptoms**

Behavioral and psychological symptoms of dementia (BPSD) is defined as an array of symptoms a person with dementia may have as the disease advances into the later stages. BPSD includes psychological reactions, psychiatric symptoms, and behavioral changes. As there is no cure for treating BPSD, caring for an individual with dementia long-term can impact the caregiver's health as well as cause diminishing quality of life of the individual with dementia (Lethin, Hallberg, Karlsson, & Janlöv, 2016). Therefore, understanding how to manage a person's symptoms can contribute to guiding treatments and management of the disease. Different types of dementia have distinct and more prominent types of BPSD. In Alzheimer's

disease, the patient may show more apathy, agitation, depression, anxiety, and irritability. In comparison, Lewy bodies dementia patients experience visual hallucinations, delusions, and REM sleep behavior disorder (McKeith & Cummings, 2005). Certain BPSD symptoms may cause a person to perform risky behaviors, including wandering out of the house or saying inappropriate or aggressive statements. In a study done in Shanghai exploring the prevalence of BPSD in a population of community-dwelling individuals diagnosed with dementia, every participant (n=637) experienced at least one BPSD, with the most common symptoms being sleep disturbance (21.9%), irritability (19.6%), apathy (15.7%), depression (14.4%), and aberrant motor behavior (14.2%) (Haibo et.al., 2013).

Treatment and management of BPSD is often accomplished by pharmacological means, however, evidence suggests that person-centered approaches can be as effective as pharmacological treatment. Apampa and Navti (2014) explain that, “medicines play a key role in the management of persons with dementia by delaying cognitive decline and ameliorating the behavioral and psychological symptoms associated with dementia” (Apampa & Navti, 2014, p. 1). While the use of pharmaceuticals (antipsychotics, antidepressants, anti-anxiety) may be an effective solution in reducing BPSD for some patients, there are multiple side-effects that can affect the patient’s participation in occupations and quality of life (Long, 2017). In a recent Canadian study, persons with dementia taking antipsychotics had a higher risk of ischemic stroke and death (Long, 2017). Using a holistic approach in decreasing BPSD can be promoted through behavioral therapy, modifications in the environment, and therapeutic programs that promote engagement. However, there is a need for more research regarding how to incorporate these strategies into practice and treatment for individuals with dementia.

Current literature presents information of how participation in sensory-based programs is associated with improving BPSD (Cohen-Mansfield, 2018). BPSD includes disturbed thought and perception, mood, behavior, agitation, depression, aggression, and psychosis. BPSD may include behaviors such as yelling, repetitive questioning, apathy, and wandering. As dementia progresses, the symptoms worsen (De Oliveira, et al., 2015). Nonpharmacological interventions, such as a music-based therapy group, have been shown to reduce symptoms of BPSD, specifically, agitation and depression (De Oliveira et al., 2015). In a study that explored the effects of a music group on anxiety and agitation in individuals with dementia, the results demonstrated that participation in a music intervention had a significant effect in reduction of anxiety (Sung, et al. as cited in De Oliveira, et.al, 2015). Nonpharmacological strategies can reduce the use of antipsychotic drugs, which can lead to safety concerns and morbidity(De Oliveira et al., 2015). Undesired side effects of pharmacological treatments, including antipsychotics and benzodiazepines, have promoted a search for alternative treatments for BPSD (De Oliveira et al., 2015).

### **Dementia: Allen Cognitive Levels**

Occupational therapists may use a cognitive assessment called the Allen Cognitive Level Screen – Version 5 (ACLS-5) to determine the progression of dementia and level of cognition. The screen consists of learning three visual-motor tasks, including performing the single cordovan stitch, running stitch, and whipstitch with a needle and piece of leather, with each stitch increasing complexity in activity demands. The assessment measures the perceptual-integrative cognitive abilities and impairment in functional cognition (Allen, 1991). The ACLS-5 identifies six levels of cognition: Level 1 - automatic actions, Level 2 - Postural actions, Level 3- Manual

actions, Level 4 - Goal-directed actions, Level 5 - Exploratory actions, Level 6 - Planned actions (David & Riley, 1990).

## **Dementia: Activities of Daily Living**

Activities of daily living (ADLs), such as bathing and self-feeding, are occupations that dementia patients may have difficulty performing (American Occupational Therapy Association, 2014). BPSD has been shown to have a negative impact on ADLs. As dementia is a progressive disease, participation in ADLs gradually decreases until the late stage, in which the individual with dementia is fully dependent on caregivers. In the United Kingdom, a study was done to observe which activities were impaired at each stage of dementia and to what degree of impairment. The study results found that from early to late stages, the ADLs of bathing, dressing, and continence were diminished rapidly. On the other hand, toileting, transferring, and self-feeding deteriorated at a slower rate across the stages (Giebel, Sutcliffe, & Challis, 2015). In a study done in Hong Kong, researchers analyzed the level of activity participation and how that correlated with the wellbeing of the person with dementia in a long-term care setting. The study found that participants mainly spent their time in a passive state or sleeping, but when an occupational therapist or healthcare provider promoted engagement in meaningful activities, participants were able to maintain positive engagement in activities (Chung, 2004). The study found that after social interaction, eating was “the second most important activity participants were engaged in during the observation period, regardless of their levels of cognitive impairments” (Chung, 2004, pg. 30). The occupation of feeding is a basic activity that all humans require to live. Study findings suggested that being able to self-feed also encourages



social participation and engagement in meaningful activity (Chung, 2004). For many, eating is associated with family, friends, conversation, culture, and celebration.

## **Sensory-Based Programs**

Sensory-based programs apply a Sensory Integration-based approach to adult populations to address sensory integration and sensory processing problems. These processing problems can cause deficits in occupational performance due to the way the nervous system organizes and uses sensory information, resulting in poor emotional regulation, attention, problem solving, skill performance, and interpersonal skills (Mori, 2017). Sensory Processing Disorder (SPD) is the umbrella term used for the identification of sensory modulation disorders, sensory discrimination disorders and sensory-based motor disorders (Champagne, 2003). Sensory modulation programs are used to address SPD (Champagne, 2003). Champagne's sensory modulation program was created as a guide for the incorporation of sensory modulation concepts and strategies (Champagne, 2003). SPD includes the therapeutic use of self, sensory-related assessment processes, integrative sensorimotor therapies, varied treatment approaches, programming and environmental modifications (Champagne, 2003). The programs are meant to be used in conjunction with other assessments or therapeutic interventions to facilitate occupational performance and recovery (Champagne, 2003). Sensory modulation outcomes include: increased self-awareness, increased ability to self nurture, increased resilience, increased self-esteem and body image, increased ability to engage in therapeutic activities, increased ability to engage in self-care activities, increased ability to engage in meaningful life roles, increased ability to engage in social activities, increased ability to cope with triggers, and increased ability to rest and sleep (Champagne, 2003). Sensory modulation approaches may be used by therapists

employing an Ayres' Sensory Integration approach, as well as a host of other specially trained professionals, consumers, and caregivers (Champagne, 2003). This is possible because sensory approaches can be used in program development, school routines, and environmental enrichment efforts in various organizations to positively influence the process of self-organization and positive change (Champagne, 2003). Occupational therapists have been trained and are skilled to identify and treat occupational performance issues that be the result of sensory integration, sensory modulation, and psychosocial deficits (Mori, 2017). Sensory modulation approaches are used by occupational therapists during the assessment and intervention process to help individuals prepare, enhance, and/or maintain the ability to engage in meaningful life roles and occupations. Examples of approaches include orienting/ alerting activities and activities promoting increased connectedness, such as a sensorimotor group (Champagne, 2003). Music Therapy is a common modality for sensory modulation (Champagne, 2003).

Sensory-based programs are a mixture of the concepts of sensory integration, and sensory modulation. Research of current approaches in treating older adults with dementia to decrease negative symptoms and increase quality of life, revealed the trend of using a multi-sensory protocol designed for this population (Tonelli, 2016). Kverno et al. (2009) noted in their literature review of non-pharmacological treatment of individuals with dementia that “individuals with advanced levels of dementia benefited from a greater extent from non-verbal patterned multisensory stimulation (as cited in Tonelli, 2016). Multisensory stimulation incorporates the use of tactile, visual, auditory, olfactory, and gustatory sensory pathways, along with movement, to help the individual interpret his or her environment (Tonelli, 2016). This type of multisensory stimulation can be found in a sensory-based program, such as a drumming group. Sensory modulation is how an individual regulates their responses to sensations. BPSD

characteristics, such as changes in mood, agitation, and behavior are examples of how individuals respond and modulate the sensations around them.

## **Sensory Modulation in Older Adults with Dementia**

Older adults tend to notice less sensory stimulation, engage in less sensory seeking behaviors, and have difficulties inhibiting irrelevant stimuli (Chung, 2006). The dementia-biological model has suggested that neurological changes in the brain and severe brain deterioration are possible factors affecting normal perception and processing of sensory information in older adults with dementia (Chung, 2006). Passive and indifferent behaviors displayed in individuals with dementia can be explained by a disruption of the brain structures responsible for integrating emotional and sensory information necessary for goal-directed behavior (Chung, 2006). An increased use of sensory-based interventions, such as music therapy, has been seen in dementia care with positive outcomes when addressing BPSD (De Oliveira et al., 2015). These interventions focus on providing sensory stimulation to older adults with dementia who are either under-stimulated or over-stimulated (Chung, 2006).

## **Music Therapy**

Music therapy, as defined by The Australian Music Therapy Association, is “a research-based practice and profession, in which music is used to actively support people as they strive to improve their health, functioning, and wellbeing” (Matthews, 2015, p. 576). Music therapy is an intervention that may be used with diverse populations, incorporating all ages and cultures. It has been used with individuals suffering from pain, mental health disorders, and a wide variety of

conditions. Music therapy can be applied in settings such as an individual's home or in skilled care facilities in either group or individual sessions.

There are two types of music therapy; passive and active. Using passive music therapy, such as listening to music, requires no active participation. Active music therapy (AMT) involves engagement of the participant via instrument playing, singing, or song composition. These two types of music therapy affect the brain differently. Studies have shown the amygdala, thalamus, anterior medial frontal cortex, superior temporal sulcus, and temporal poles are activated while listening to music. Multiple studies using functional magnetic resonance imaging (fMRI) and positron emission tomography (PET) scans have demonstrated that use of active music therapy involves additional parts of the brain compared to passive music therapy. In addition to those parts of the brain used for passive music therapy, AMT involves the cerebellum, basal ganglia, and cortical motor areas (Prakash, n.d). The use of music therapy with dementia patients may increase engagement, decrease agitation, and improve mood and behavior. Music therapy intervention may also improve functional performance during tasks and activities.

### **Music Therapy: Effect on Cognition and Behavior**

In a study done to assess how active music therapy improves cognition and behavior in patients with chronic vascular encephalopathy, positive changes were shown in attention, visuomotor coordination, selective attention, and verbal and spatial memory (Giovagnoli, Oliveri, Schifano, & Raglio, 2014).

Before receiving AMT, the patient had severe deficits in episodic and visuospatial memory and attention. After AMT was used as an intervention, improvement was seen in topographic

memory, spatial orientation, and an increase in self-motivation to carry out daily activities. The patient participated in an AMT intervention group with two other adult patients who also were experiencing cognitive decline. The music therapy was implemented by a licensed music therapist. Sessions would begin with activity or songs to evoke emotions from participants. Next, they were asked to play instruments together, either taking a leadership role, following another participant's lead, or to listen to the others playing. Participants were not restricted or directed to playing any specific types of music. They were free to produce rhythm and melodies of their choice by singing or playing instruments. Outcomes were tested using a Neuropsychological assessment and Psycho-behavioural assessment over the course of four evaluations before and after AMT. Neuropsychosocial changes, including significantly improved attention, visuomotor coordination, verbal and spatial memory, as well as a consistent reduction of anxiety were observed after the participant completed the 16 AMT sessions and were still apparent at three month follow up (Giovagnoli, Oliveri, Schifano, & Raglio, 2014).

Music therapy is being used successfully with patients with chronic brain diseases or dysfunction to decrease distress from cognitive decline and to increase emotional well-being, which in turn, increases motivation and interest in participating in activities (Giovagnoli et al., 2014). Standardized neuropsychological assessments were used before and after 3 patients received AMT intervention, including creative and interactive music playing, to test short term memory, long term memory, selective and divided attention, visuomotor coordination, and apraxia in individuals with degenerative cognitive decline. The Multiple-Ability Self report Questionnaire (MASQ), Beck Depression Inventory (BDI), State Trait Anxiety Inventory (STAI1, STAI2), Lubben Social Network Scale (LSNS), and World Health Organization Quality of Life (WHOQoL 100) were also used to assess cognitive abilities and behaviors. The

outcome showed AMT played a positive role in decreasing anxiety and improving cognition and psycho-behaviour (Giovagnoli, Oliveri, Schifano, & Raglio, 2014).

## **Music Therapy and Dementia**

Due to an increased interest in non-pharmacological creative therapeutic approaches in dementia care, music therapy is being explored as an intervention in a multitude of settings for the treatment of BPSD in the dementia population. Non-pharmacological interventions are necessary to avoid cerebrovascular events and other side effects associated with pharmacological treatment. It is suggested that a combined approach of pharmacological and nonpharmacological interventions would be best to manage BPSD (Ueda, Suzukamo, Sato, & Izumi, 2013). Studies have indicated music therapy is associated with a reduction in anxiety, and agitated behavior by activating the amygdala in patients with dementia. Behavioral symptoms for this study were measured by the Cohen-Mansfield Agitation Inventory and the Neuropsychiatric Inventory (Ueda, Suzukamo, Sato, & Izumi, 2013).

The methodology being used to study how music affects individuals with dementia focuses on the medical and neuroscience model. Music is the stimulus the brain is receiving as input to initiate output. Studies have shown that music is associated with improved communication. In a research study conducted in Watertown, UK, done with a social group for individuals with dementia and their caregivers, called Singing for the Brain, music was used to elicit responses during interviews with participants. When individuals had difficulty in communicating responses to the interviewer, they sang familiar lines from songs to respond to the questions. Music was also used as a stimulus to evoke memories during the interviews. It allowed the interviewer to gather personal data about participant's lives (Hara, 2011).

## **Drum Therapy**

Rhythm-making has been used as a healing ritual in many cultures, worldwide, for years, and currently, drumming is being used as a therapeutic intervention, including with the elderly population. Drum therapy (Dt) is an active music therapy intervention that has been shown to have benefits in areas of social outcomes, mood, anxiety, stress relief, and relaxation (Fleming & Gallant, 2017). Dt is being used in many different settings to promote wellness, to empower the participant, and to achieve therapeutic goals. Rhythm perception is innate in newborns and continues to develop in adults (Wang & Huang, 2014). Rhythm plays a functional role in cognition, such as attention and coordination via beta rhythms, neural brain waves associated with consciousness and logical reasoning, which are produced in the basal ganglia and motor cortex (Cannon, McCarthy, Lee, Lee, Borgers, Whittington, & Kopell, 2014).

The Elders Drum Project is an occupational therapy program that uses drumming and drum making to achieve objectives, improve functional status, create social participation, and enhance the wellbeing of residents in a skilled nursing facility. Five participants were interviewed and observed to collect data and analyze whether drum therapy had positive effects. Inclusion criteria for the study included that cognitive functioning had to be within normal limits and subjects were required to both understand the intention of the study and to be able to give their consent to be a participant.

Participants in the project demonstrated improved abilities, goals, and health, both physically and psychologically, in addition to improvement in self-directed engagement in purposeful activity, as measured through semi structured interviews and observations. In addition, health status was measured through the use of psychosocial, sensorimotor, and cognitive skills (Fleming & Gallant, 2017). The participants in this study did not have dementia.

The Elder's Drumming Group objectives were to improve physical and psychological health in older adults. The results of the study show promise for the use of drumming as a nonpharmacological treatment for residents of long term care facilities.

## **Conclusion**

Pharmaceutical interventions have been commonly chosen over therapeutic interventions in order to quickly treat and manage sx's of BPSD. Research has found that non-pharmacological interventions, such as music therapy, can encourage positive functional outcomes including improving behavior, cognition, and decreasing BPSD. Drumming groups combine motor movement with auditory and tactile input, making this a sensory-based program. However, research on sensory-based programs is often focused on changes in BPSD, and does not study the effect on functional performance. Therefore, further research is necessary in order to learn more about the effectiveness of sensory-based programs, such as a drumming groups, as an intervention to improve functional performance for individuals with dementia.



## **Statement of Purpose**

The purpose of this study was to examine whether participation in a sensory-based program can improve function for individuals with dementia when completing occupational activities. The hypothesis of this study was that participating in a sensory-based program, a drumming group, would result in improved mood, decreased agitation, and increased functional performance, when compared to baseline. The study's research question was: Does participation in a drumming group have a positive impact on functional performance among individuals with dementia, as measured by a lower level of agitation, and a higher level of function, mood and self-feeding compared to when participants do not participate in the group?

## **Theoretical Framework: Sensory Integration**

Sensory integration (SI) is both a theory and frame of reference that will be used to shape this study. Ayres SI is used to explain behavior and plan intervention (Roley, Mailloux, Miller-Kuhaneck, & Glennon, 2007). SI describes typical sensory integration development, sensory integration dysfunction, and guides interventions. Ayres' theory emphasizes that in order for an individual to act efficiently in their environment, they must be able to process sensations appropriately with their body and integrate the sensory input with information around them (Schell, Gillen, & Scaffa, 2014). The SI theory contributes to the understanding of sensory processing and its impacts on learning, social-emotional development and neurophysiological processes (Schell, Gillen, & Scaffa, 2014).

SI is a way of describing the neural organization of sensory information for functional behavior (Case-smith & O'Brien, 2015). Jean Ayres definition of SI is the "organization of sensation for use" (Case-smith & O'Brien, 2015). Ayres considered sensory input to be sensory nourishment for the brain, just as food is nourishment for the body (Case-smith & O'Brien, 2015). Wilbarger, a colleague of Ayres, built on this concept with the term sensory diet, an intervention program that involves provision of individualized sensory experiences and activities throughout the day to support optimal functioning with sensory integration challenges (Case-smith & O'Brien, 2015). Occupational therapists use SI approaches such as, sensory-based programs, when working with individuals whose participation restriction appears to be due to difficulty processing and integrating sensory information and is not specific to individuals with dementia (Schaaf & Davies, 2010).

Sensory modulation approaches may be used by therapists employing an Ayres' Sensory Integration approach (Champagne, 2003). Bundy and Murray emphasized that individuals who

have difficulty modulating sensation will have difficulty interacting with people and their environment (Schell, Gillen, & Scaffa, 2014).

This study applied concepts from the SI framework (multi-sensory protocol & sensory modulation) to create a sensory-based drumming group that will elicit sensory input for the participants. The participants in this study present with deficits in modulating sensation, and the interventions utilized are designed to address these deficits. The constructs of the SI model were used to support the methodology of this study and to determine the validity of the drumming group as a potential treatment option for individuals with dementia. This framework can be used to determine whether sensory-based interventions, such as a drumming group, can improve engagement, functional performance, and mood. Occupational therapists can be guided by this framework to understand how increased sensory input, auditory and tactile, may impact an individual's (with dementia) ability to participate in meaningful activities.

## **Ethical Considerations**

For this study, the student researchers obtained approval from the Institutional Review Board for the Protection of Human Participants (IRBPHP). The study adhered to the American Occupational Therapy Association Code of Ethics (2015). Principles that were followed include beneficence, nonmaleficence, autonomy, justice, fidelity, and veracity.

The principle of beneficence requires that the researchers demonstrate a concern for the well-being and safety of the participants of the study (AOTA, 2015). To demonstrate beneficence, the participants completed a consent form to participate in this study without coercion from the researchers (Appendix A). Due to the study involving the dementia population, participants were not able to give their own consent. Therefore, to keep beneficence, the researchers asked the participant's power of attorney to complete a proxy consent (Appendix B). The principle of beneficence promotes good and prevents harm from occurring to the participants, and the necessary steps were taken to promote legal practices during this study.

The principle of nonmaleficence refers to the obligation of preventing harm to the participants, even if potential risk is without malicious or harmful intent (AOTA, 2015). In the consent form, it informs the participant and their power of attorney that they have the right to terminate their participation in the study at any time. Potential harm that may arise during the study include feelings of fatigue, increased behavioral and psychological symptoms of dementia, and other symptoms of distress. Rest breaks were available, if the participant reported experiencing these symptoms.

The principle of autonomy asks that the researcher respect the rights of the participants to self-determination, privacy, confidentiality, and consent (AOTA, 2015). The researchers provided the participants with consent and proxy consent forms prior to their participation in the

study. The researchers also respected the participant's decision to withdraw from the study at any time. confidentiality was protected by assigning identification numbers to subjects, and storing confidential information in a secure location.

The principle of justice requires the researcher to provide fair and equitable treatment of the participants (AOTA, 2015). The researchers ensured participants were treated fairly throughout the study and that all participants had equal opportunity to positive health outcomes that may have derived from participation in drum therapy group. The researchers provided participants with impartial treatment regardless of economic status, disability, religion, culture, gender, ethnicity, or race (AOTA, 2015).

The principle of fidelity was used throughout the study to ensure respect of the profession of occupational therapy and of all health professions. The researchers were not only respectful of the participant in the study, but also of the caregiver, related staff members, and fellow researchers..

The principle of veracity required the researchers to demonstrate honesty, accuracy, and to be comprehensive and objective when reporting findings (AOTA, 2015). When participants and their power of attorney signed the consent and proxy consent form, they were provided honest and complete information regarding the study and thereafter for the duration of study. Researchers did not take credit for another researcher's work.

For this study, the researchers utilized four assessments to assess the participant's behavior and physiological performance: Agitation Behavior Scale (ABS) (Appendix C), Functional Behavior Profile (FBP) (Appendix F), Visual Analog Scale (VAS) (Appendix E), Self-Feeding Questionnaire (SFQ) (Appendix D). The FBP is public domain. The researchers contacted the owners of the ABS and VAS measures and received permission to use them in the

study. The researchers developed the SFQ following the AOTA Code of Ethics (2015). In preparation of this study, the researchers took the necessary steps to follow all ethical and legal procedures.

## **Methodology**

### **Quantitative Design**

This was a quantitative study using quantitative data collection and analysis strategies. Participants were recruited at a skilled nursing facility and were asked to participate in a drumming group. Four measures were administered at baseline and after participation in the group to assess whether function, mood, behavior, and agitation improved after participating in a drumming group.

### **Participants**

A total of eight residents at Ensign Cloverdale Health Center participated in the study. (n=8). There were three male participants and five female participants. There was one Chilean, one Filipino, one Russian, and five Caucasian participants. Seven participants were English speaking and one was Spanish speaking. Participants' ACL levels ranged from 2.8-4.8.

### **Recruitment**

The study design used a convenience sample strategy to recruit participants. Participants who participated in the facility's drumming group were invited to participate in the study. The participants ranged between ACL levels three and four. The researchers worked with the facility staff to identify participants, and the staff obtained permission for the researchers to contact the participant's power of attorney. The researchers asked for consent from the participants and their power of attorney.

## Measures

**The Functional Behavioral Profile (FBP) (Appendix F).** The Measurement Instrument Database for the Social Sciences (2017) describes the FBP as a tool used to provide caregivers with a method of describing a person's capabilities in performing tasks, social interaction, and problem solving. The FBP contains 27 items evaluating performance of daily living activities. Each item is rated from zero to four according to the individual's behavior, and the total score is derived from the instrument (Measurement Instrument Database for Social Sciences, 2017). In this study, the FBP was utilized before and after the participants engaged in the drumming group. By using the FBP, the researchers rated the participant's capabilities in performing functional skills, including engaging in social interaction activity, problem solving, and duration in completing the task. The researchers modified the FBP and removed the problem solving section of the measure, as the problem solving questions addressed functional skills that were not used when engaging in self-feeding. The FBP had a total summary score of 27. The Internal Consistency of the FBP was determined excellent as proven through Cronbach's alpha's (Functional Behavior Profile, 2018). Concurrent Validity of the FBP was also proven as excellent (Functional Behavior Profile, 2018).

**Agitated Behavior Scale (ABS) (Appendix C).** The ABS was developed to assess the extent of agitation during the acute phase of recovery from acquired brain injury (Bogner, 2000). The ABS includes 14 questions related to agitated behaviors. The ABS can be useful with populations such as individuals recovering from acquired brain injuries and nursing home residents with progressive dementias (Bogner, 2000). The ABS uses a 1-4 numerical scale to determine whether agitation is present and to what degree: absent, slight, moderate, or extreme.



The ABS has been shown to have strong interrater reliability and construct validity (AbilityLab, 2012). The ABS was utilized before and after the drumming group.

**Self-Feeding Scale Questionnaire (SFQ) (Appendix D).** The SFQ was a measurement created by the researchers to measure an individual's level of engagement during self-feeding. The questionnaire was divided into five questions about the occupation of self-feeding with another section that rated engagement on a scale from 0-4. An example question from the form is, "Is the patient engaged in the self-feeding process?" An example of the engagement rating scale is "none or very little of the time." The questionnaire was administered during lunch of the baseline and drumming day. The self-feeding scale had a total summary score of 20.

**Visual Analog Scale (VAS) (Appendix E).** The VAS was developed as a mood assessment for adults (18 years or older) in clinical situations, in which the administration of assessments involving linguistic and cognitive stimuli/responses might not be feasible (Stern, 1996). Patients with neurological disorders such as dementia, stroke, and traumatic brain injuries are the target population when administering this scale (Stern, 1996). These patients have the possibility of experiencing concurrent mood and anxiety disorders, which may interfere with their cognitive responses. The VAS has seven visual analog mood items ranging from 1 (very upset) to 7 (very happy). The test could be self-administered, or administered by a trained examiner (Stern, 1996). In a study that used the VAS to evaluate the effects of a group music intervention when managing behavioral and psychological symptoms in Chinese elderly with dementia, the measure showed good levels of reliability (Ho et al., 2018). The researchers used the VAS on baseline day and drumming day as an observation tool to measure mood.

## **Study Design**

The study design was a pre-test post-test quantitative study. Inclusion in the study required that participants be within the Allen-Cognitive Levels of 3 and 4 and be able to cognitively and physically engage in the drumming group. Allen-Cognitive Level 3 includes the ability to do manual actions in response to tactile cues, while Allen-Cognitive Level 4 includes goal-directed actions and demonstration of an awareness of a familiar end-product, but fails to solve new problems, anticipate, or correct mistakes (Allen, 1991). Participants were excluded from the study if they were in the late or end stage of dementia (ACL Levels 1-2), had upper extremity impairments hindering their ability to drum, or other factors that would interfere with the study.

## **Drumming Group**

This quantitative pilot study explored whether engaging in a sensory-based program could positively impact an individual with dementia in order to help increase engagement in a functional activity. The study analyzed the effect of participating in a drumming group and the behavioral changes in individuals with dementia.

Participants participated in a drumming group for 30 minutes led by a certified drumming instructor. The instructor acted as a guide and administered many different drumming sequences and rhythms for the participants to follow. Each individual had the opportunity to introduce themselves with a beat, bang the drum in a sequential order, sing a song while drumming on beat, and also create a beat for everyone to mimic. The drumming instructor also facilitated

social interaction with the participants, including engaging the participants including singing a song and creating different beats.

After the drumming group, participants performed in the ADL task of self-feeding, which was supervised or assisted by their caregiver. The researchers filled out four different measurements that captured the participant's mood, agitation, engagement in self feeding, and functional behavior before and after the drumming group. Data was collected over two days (Figure 1), a baseline day and a drumming day. On the baseline day, in which there was not a drumming group, the researchers conducted observations only during lunch, using the four outcome measures VAS, ABS, FBP, and SFQ to determine the participant's baseline scores as dependent

variables. On the baseline day, prior to lunch, the ABS and VAS were administered. During lunch on baseline day, the FBP and SFQ were administered. On drumming day, the same four measures were repeated, however, the participants engaged in a drumming group before lunch. Both before and after the drumming group, the ABS and the VAS were administered. During lunch, the FBP and the SFQ were

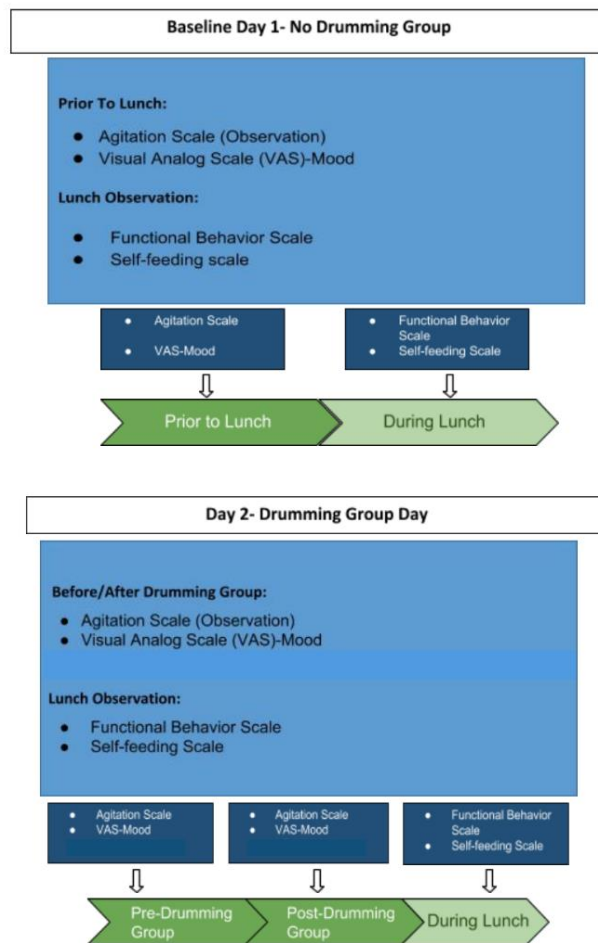


Figure 1 Research Schema

administered. The researchers went in pairs to the facility to observe the participants during lunch and before/after participating in the drumming group.

## **Data Collection Procedures**

The researchers received training by their faculty advisor and practiced collecting data by rating videos using the four measures prior to starting the study to ensure satisfactory interrater reliability. Adequate interrater reliability was confirmed. To eliminate possible bias or error, the researchers observed and rated the participants in pairs, and results were averaged.

Code numbers were assigned to the participants in place of their name to ensure confidentiality. Data that was collected on the SFQ, VAS, FBP, and ABS was entered onto an excel master data sheet under the participant's code number.

## **Data Analysis**

Data collected from the four measures were documented in Excel spreadsheets that were only accessed by the researchers and their advisor. The excel spreadsheets were then analyzed on a data analyzing program called Statistical Package for the Social Science (SPSS). A pretest posttest design was utilized to analyze whether the drumming group had an effect on the participant's mood and behavior when performing self-feeding. After gathering the data sets from the pretest and posttest, a T-test was used to compare the means of the scores to determine whether a significant difference existed between the scores before and after the drumming group.

## Results

### Baseline Results

At baseline, agitation had a mean of 1.09 (M=1.09) and a standard deviation of 0.15 (SD= 0.15), demonstrating a low level of agitation. Mood had a mean of 3.75 (M=3.75) and a standard deviation of 1.28 (SD=1.28), demonstrating low mood. The functional activity of self-feeding had a mean of 2.26 (M=2.26) and a standard deviation of 0.82 (SD=0.82) demonstrating low engagement in self-feeding. Functional behavior had a mean of 2.92 (M=2.92) and a standard deviation of 1.15 (SD=1.15) indicating decreased engagement in social interactions and activities.

### Comparison of means

A paired t-test was conducted to compare mood, agitation, functional behavior, and self-feeding skills before and after participation in a drumming group (Table 1). There was a positive improvement in mood before and after participation in the drumming group. A positive trend of improvement was noted in the ABS, FBP, and SFQ after participation in the drumming group, but the scores did not reach significance.

	Baseline Mean (SD)	Drumming Mean (SD)	t-value	p-value
VAS	3.75 (1.28)	5.63 (0.74)	-4.71	0.002**
ABS	1.09 (0.15)	1.01 (0.03)	NS	0.164
FBP	2.92 (1.15)	3.03 (1.24)	NS	0.43
SFQ	2.26 (0.82)	2.73 (1.29)	NS	0.41
** p < .0001				

Table 1 Data Results

## Discussion

This study investigated whether participation in a sensory-based program, specifically a drumming group, would increase functional performance, mood, and self-feeding among individuals with dementia. At the beginning of the drumming group, a few of the participants expressed confusion and agitation in the activity they were being asked to take part in. Other participants were disengaged and sleeping. Many of the participants presented with a flat affect. During the course of the drumming group, the participants became more engaged and their mood improved, as the researchers observed participants smiling, spontaneously singing songs, and actively participating. Furthermore, participants were responsive to their name and additional direct cues throughout the group. These observations were consistent with the significant improvement in mood noted in the study.

There was not a significant change in functional performance following the drumming group, as measured during a self-feeding session. This may have been due to fatigue after participation in the group or the duration of time between the end of the drumming group and when the participants were served lunch. Positive trends were noted in agitation and functional behavior, however, participants' agitation level was low at the start of the drumming group. Insignificant change may also have been due to a floor effect, in that there was not a need to lower levels of agitation, and the scales did not have much room for improvement. Researchers were surprised by insignificant results in self-feeding and functional behavior, but were encouraged by the positive trends in all measures and significant change in mood. This study was quite small, and further investigation in a larger study is warranted. Results from the study indicate that a sensory-based intervention program, such as a drumming group, may improve mood and engagement for individuals with dementia.

## Limitations

Limitations to this study include the extended time gap between the end of the drumming group and a participant receiving their lunch tray. Due to logistics, there was a 20-minute delay between when the group ended, and when participants were served their lunch. This delay may have diminished the effects of the drumming group on participants' self-feeding performance. Another possible limitation could have been the lack of tracking of medications before, during, or after the drumming group. The data collectors were not disclosed information regarding medication. Therefore, medication could have also impacted results. The small sample size is an additional factor that may have influenced the results. This was a pilot study, and the size of the research sample was small. A future study with a larger sample size will likely provide more robust results. Fatigue also may have interfered with accurate scores due to participants experiencing more activity in the drumming group than they do in a typical day (without the drumming group). Lastly, measurements may not have adequately captured the effects of the drumming group. Researchers agreed that measurement of arousal, alertness, and engagement would have been appropriate to capture during the drumming group, as participants appeared to become more "awake" during the group, and these measures would have been more likely to capture the benefits observed during the group.

## **Implications for Practice and Future Research**

The findings from this study have implications for occupational therapy practice in long-term care for the growing dementia population, and include the following:

- The study demonstrated that participating in a drumming group improves mood and engagement.
- A suggestion for future research would be to measure arousal or engagement as an outcome measure during participation in a drumming group.
- Providing sensory-based interventions may be a viable non-pharmacological intervention for the dementia population.



## Conclusion

This study explored the effectiveness of a drumming group as a non-pharmacological intervention for improved mood, and overall functional engagement for individuals with dementia. The study's results are preliminary findings that facilities should consider when creating future group programs for their residents. The medical stigma that surrounds individuals with chronic conditions involves patient abandonment. This often comes from the idea that the progressive nature of a condition, such as dementia, does not permit these individuals to engage in meaningful activities. The study's findings suggest that participation in a sensory-based program has a multitude of benefits. This research will hopefully inspire future healthcare professionals to provide additional non-pharmacological methods to slow decline within the dementia population, while increasing engagement and quality of life.

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## Appendix A

## CONSENT FORM TO BE A RESEARCH PARTICIPANT

### DOMINICAN UNIVERSITY OF CALIFORNIA

1. I understand that I am being asked to participate as a Participant in a research study designed to assess whether participation in a sensory modulation program drumming group has a positive effect on engagement in ADLs for individuals with dementia. This research is part of Heather, Jacob, Ivy, and Naomi's Student Senior Thesis research project at Dominican University of California, California. This research project is being supervised by Susan Morris, PhD, OTR/L, Occupational Therapy Department, Dominican University of California.
2. I understand that participation in this research will involve taking part in a Sensory Modulation drumming group for 30 minutes.
3. I understand that my participation in this study is completely voluntary, and I am free to withdraw my participation at any time.
4. I understand that disclosed information will be kept confidential. All documents will be identified using an identification number, and only the research team will have access to the identification number key. Only overall results and conclusions from the study will be shared with Ensign personnel.
5. I understand that my participation in this study is completely voluntary and I am free to withdraw my participation at any time.
6. I am aware that all study participants will be furnished with a written summary of the relevant findings and conclusions of this project. Such results will not be available until May 1, 2018.
7. I understand that by participating in this study, I am contributing to the development of quality dementia care in assisted living facilities. I may experience improved behavior when performing meaningful occupations. I may also experience fatigue and increased behavioral symptoms of dementia.
8. I understand that my participation involves no physical risk, however, if I experience any problems or serious distress due to my participation, I am free to withdraw from the study. The researchers may be contacted at [drumming4dementia@gmail.com](mailto:drumming4dementia@gmail.com).
9. All procedures related to this research project have been satisfactorily explained to me prior to my voluntary election to participate.



10. I understand that if I have any further questions about the study, I may contact the researchers at [drumming4dementia@gmail.com](mailto:drumming4dementia@gmail.com) or her research supervisor, Susan Morris ([susan.morris@dominican.edu](mailto:susan.morris@dominican.edu)). If I have further questions or comments about participation in this study, I may contact the Dominican University of California Institutional Review Board for the Protection of Human Participants (IRBPHP), which is concerned with the protection of volunteers in research projects. I may reach the IRBPHP Office by calling (415) 482-3547 and leaving a voicemail message, by FAX at (415) 257-0165 or by writing to the IRBPHP, Office of the Associate Vice President for Academic Affairs, Dominican University of California, 50 Acacia Avenue, San Rafael, CA 94901.

**I HAVE READ AND UNDERSTAND ALL OF THE ABOVE EXPLANATION REGARDING THIS STUDY. I VOLUNTARILY GIVE MY CONSENT TO PARTICIPATE. A COPY OF THIS FORM HAS BEEN GIVEN TO ME FOR MY FUTURE REFERENCE.**

---

Signature

---

Date

## Appendix B

## **PROXY CONSENT FOR RESEARCH PARTICIPATION**

### **DOMINICAN UNIVERSITY of CALIFORNIA PROXY CONSENT FOR RESEARCH PARTICIPATION**

#### **Purpose and Background**

Heather August, Jacob Gantan, Ivy Torres, and Naomi Wong, occupational therapy graduate students, and Susan Morris, PhD, OTR/L, Assistant Professor, Department of Occupational Therapy at Dominican University of California, are doing a study assessing whether participation in the drumming group improves individuals with dementia ability to participate in other functional activities.

My family member is being asked to participate because s/he suffers from dementia.

#### **Procedures**

If I agree to allow my family member to be in this study, the following will happen:

1. My family member will be observed while he/she drums with other participants. The drumming group will last 30 minutes.
2. The researchers will review my family member's medical records to obtain information about the nature and extent of his/her dementia.
3. The caregiver will complete the questionnaire describing the family member's performance of occupations in an enclosed office/room at the facility.

#### **Risks and/or discomforts**

1. My family member may become uncomfortable or upset during the 30-minute drumming group. Participants may elect to stop in participation in the drumming group at any time.
2. Study records will be kept confidential. No individual identifiers will be used in any reports or publications resulting from the study. All personal references and identifying information will be eliminated when the data are transcribed, and all participants will be identified by numerical code only, thereby ensuring confidentiality regarding the Participant's responses. The master list for these codes will be kept by Ms. Susan Morris, PhD, OTR/L, in a locked file, separate from the transcripts. Only the researcher and their faculty advisor will see the coded transcripts. One year after the completion of the research, all written and recorded materials will be destroyed.

#### **Benefits**

There may be a direct benefit to your family member from participating in this study. The anticipated benefit of this study is a better understanding of the effect that sensory modulation drumming groups have has on individuals with dementia. Examples of positive outcomes include improvement in self-feeding, behavior, and increased occupational engagement.

**Costs/Financial Considerations**

There will be no costs to me or to my client as a result of taking part in this study.

**Payment/Reimbursement**

There will be no reimbursement or compensation for participation in this study.

**Questions**

I have talked to the researchers about this study and have had my questions answered. If I have further questions about the study, I may contact them at [drumming4dementia@gmail.com](mailto:drumming4dementia@gmail.com) or Susan Morris at [susan.morris@dominican.edu](mailto:susan.morris@dominican.edu). If I have any questions or comments about participation in this study, I should first talk with the researchers. If for some reason I do not wish to do this, I may contact the Dominican University of California Institutional Review Board for the Protection of Human Participants (IRBPHP), which is concerned with protection of volunteers in research projects. I may reach the IRBPHP Office by calling (415) 482-3547 and leaving a voicemail message, or FAX at (415) 257-0165, or by writing to IRBPHP, Office of Associate Vice President for Academic Affairs, Dominican University of California, 50 Acacia Avenue, San Rafael, CA 94901.

**Consent**

I have been given a copy of this consent form, signed and dated, to keep.

PARTICIPATION IN RESEARCH IS VOLUNTARY. I am free to decline to have my family member be in this study, or to withdraw from it at any point.

My signature below indicates that I agree to allow my family member to participate in this study.

\_\_\_\_\_

Signature of Participant's Family Member/Guardian

\_\_\_\_\_

Date

\_\_\_\_\_

Signature of Person Obtaining Consent

\_\_\_\_\_

Date

## Appendix C

## AGITATED BEHAVIOR SCALE

Patient \_\_\_\_\_ Period of Observation:  
 Observ. Environ. \_\_\_\_\_ From: \_\_\_\_\_ a.m. \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
 Rater/Disc. \_\_\_\_\_ To: \_\_\_\_\_ a.m. \_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_

At the end of the observation period indicate whether the behavior described in each item was present and, if so, to what degree: slight, moderate or extreme. Use the following numerical values and criteria for your ratings.

- 1 = absent: the behavior is not present.
- 2 = present to a slight degree: the behavior is present but does not prevent the conduct of other, contextually appropriate behavior. (The individual may redirect spontaneously, or the continuation of the agitated behavior does not disrupt appropriate behavior.)
- 3 = present to a moderate degree: the individual needs to be redirected from an agitated to an appropriate behavior, but benefits from such cueing.
- 4 = present to an extreme degree: the individual is not able to engage in appropriate behavior due to the interference of the agitated behavior, even when external cueing or redirection is provided.

## DO NOT LEAVE BLANKS.

- \_\_\_\_\_ 1. Short attention span, easy distractibility, inability to concentrate.
- \_\_\_\_\_ 2. Impulsive, impatient, low tolerance for pain or frustration.
- \_\_\_\_\_ 3. Uncooperative, resistant to care, demanding.
- \_\_\_\_\_ 4. Violent and or threatening violence toward people or property.
- \_\_\_\_\_ 5. Explosive and/or unpredictable anger.
- \_\_\_\_\_ 6. Rocking, rubbing, moaning or other self-stimulating behavior.
- \_\_\_\_\_ 7. Pulling at tubes, restraints, etc.
- \_\_\_\_\_ 8. Wandering from treatment areas.
- \_\_\_\_\_ 9. Restlessness, pacing, excessive movement.
- \_\_\_\_\_ 10. Repetitive behaviors, motor and/or verbal.
- \_\_\_\_\_ 11. Rapid, loud or excessive talking.
- \_\_\_\_\_ 12. Sudden changes of mood.
- \_\_\_\_\_ 13. Easily initiated or excessive crying and/or laughter.
- \_\_\_\_\_ 14. Self-abusiveness, physical and/or verbal.
- \_\_\_\_\_ Total Score

You have permission to use the Agitated Behavior Scale as long as you do not alter it. Training materials can be found at [ohiovalley.org](http://ohiovalley.org).

Jennifer Bogner, PhD, ABPP  
Professor  
Division Director of Rehabilitation Psychology  
Vice-Chair of Research  
Department of Physical Medicine and Rehabilitation  
Ohio State University  
[480 Medical Center Drive](#)  
Columbus, Ohio 43210  
P: [614-293-3830](tel:614-293-3830)  
F: [614-293-4870](tel:614-293-4870)

On Feb 18, 2018, at 7:37 PM, Heather August <[heather.august@students.dominican.edu](mailto:heather.august@students.dominican.edu)> wrote:

Hello,

My name is Heather August, and I am an Occupational therapy graduate student at Dominican University of California. I am writing to you to ask permission for my thesis group to use the Agitated Behavioral Scale as a measure in our graduate research project on using a sensory based intervention program with dementia patients. Look forward to your response,

Sincerely,

Heather August, OTS

[heather.august@students.dominican.edu](mailto:heather.august@students.dominican.edu)

## Appendix D



	0- none or very little of the time	1- 25% of the time	2- 50% of the time	3- 75% of the time	4- Most of the time, more than 75% of the time
1. Engaged in self-feeding process					
2. Alert, eyes open and attending to meal					
3. Resistant to touch, retracts from touch					
4. Attending to verbal directions and cues of CNA					
5. Correctly responds to verbal directions and cues from CNA					

Table 2 Self-Feeding Scale Questionnaire

## Appendix E

## Mood Visual Analog Scale

*“Please, indicate the face that best describes your current mood:”*



**Naomi Wong** <naomi.wong@students.dominican.edu> Feb 23 (1 day ago) ☆  
to castilla ▾

Hello,

My name is Naomi Wong, and I am an occupational therapy graduate student at Dominican University of California. I am writing to you to ask permission to use your Mood Visual Analog Scale that you developed for your "Experience-Sampling Methodology with a Mobile Device in Fibromyalgia" article as a measure in our graduate research program on using a sensory based intervention program with patients with dementia.

Looking forward to your response,

Sincerely,

...

**Diana Virginia Castilla López** 5:28 AM (15 hours ago) ☆  
to me ▾

Dear Naomi,

Thank you for your kind interest in our work. You have our permission to use the scale referring always the original work.

Castilla, D., Botella, C., Garcia-Palacios, A., Farfallini, L., & Miralles, I. (2012). Experience-sampling methodology with a mobile device in fibromyalgia. *International Journal of Telemedicine and Applications*, 2012, 1–7. <http://doi.org/10.1155/2012/162673>

I'm sending you attached the article of the RCS of this project. May be you are also interested in the visual scale base on faces (page 4).

Garcia-Palacios, A., Herrero, R., Belmonte, M. A., Castilla, D., Guixeres, J., Molinari, G., Baños & R. Botella, C. (2014). Ecological momentary assessment for chronic pain in fibromyalgia using a smartphone: A randomized crossover study. *European Journal of Pain*, 18(6), 862–872. <http://doi.org/10.1002/j.1532-2149.2013.00425.x>

You can also use this scale referring the work. On the other hand, we have used this face-scale also with elderly users with mid cognitive impairment with positive results (we are working an article of this study but I can't sending you because is in draft state yet).

Please, feel free to contact me anytime,

Best regards,  
Diana

...

## Appendix F

## The Functional Behavior Profile

Baum, C., Edwards, D. & Morrow-Howell, N.  
Washington University, St. Louis Mo.

The FBP is designed to obtain from the primary caregiver the overall capacity for their loved one to engage in tasks, social interactions and problem solving. All of the questions relate to how their loved one performs in their daily activities. As a reference, the caregiver should respond based upon the person's behavior during the past week. (It can be administered in interview or self scored format).

The participants:

Score

1. Is able to concentrate on a task for :
 

4_____	3_____	2_____	1_____	0_____	
over 25 min.	5-15 min.	3-5 min.	1-3 min.	<1 min.	T__
  
2. Finishes the tasks that have been started.
 

4_____	3_____	2_____	1_____	0_____	
Always (100%)	Usually (80%)	Sometimes (50%)	Rarely (20%)	Never (<10%)	T__
  
3. Performs work that is neat.
 

4_____	3_____	2_____	1_____	0_____	
Always (100%)	Usually (80%)	Sometimes (50%)	Rarely (20%)	Never (<10%)	T__
  
4. Can use tools or instruments in performing tasks (correct eating utensil)
 

4_____	3_____	2_____	1_____	0_____	
Always (100%)	Usually (80%)	Sometimes (50%)	Rarely (20%)	Never (<10%)	T__
  
5. Can manipulate small items (hand work, buttoning, makeup)
 

4_____	3_____	2_____	1_____	0_____	
Always (100%)	Usually (80%)	Sometimes (50%)	Rarely (20%)	Never (<10%)	T__
  
6. Activities are appropriate to the time of day (sleeps at night, alert during the day)
 

4_____	3_____	2_____	1_____	0_____	
Always (100%)	Usually (80%)	Sometimes (50%)	Rarely (20%)	Never (<10%)	T__
  
7. Performs work that is accomplished within a reasonable time frame.
 

4_____	3_____	2_____	1_____	0_____	
Always (100%)	Usually (80%)	Sometimes (50%)	Rarely (20%)	Never (<10%)	T__
  
8. Makes simple decisions independently like what to wear, what to eat , what to do around the house.
 

4_____	3_____	2_____	1_____	0_____	
Always (100%)	Usually (80%)	Sometimes (50%)	Rarely (20%)	Never (<10%)	T__
  
9. Can solve a problem when given repeated assistance.
 

4_____	3_____	2_____	1_____	0_____	
Always (100%)	Usually (80%)	Sometimes (50%)	Rarely (20%)	Never (<10%)	T__

10. Takes responsibility for tasks that previously have been theirs.(Includes responsibilities for cooking, cleaning, home-maintenance).

4_____	3_____	2_____	1_____	0_____	T__
Always	Usually	Sometimes	Rarely	Never	
(100%)	(80%)	(50%)	(20%)	(<10%)	

11. Can respond to a one-step command. ( directions to do only one thing, like “sit here”, or “take my hand”).

4_____	3_____	2_____	1_____	0_____	T__	S__
Always	Usually	Sometimes	Rarely	Never		
(100%)	(80%)	(50%)	(20%)	(<10%)		

12. Shows enjoyment in activities.

4_____	3_____	2_____	1_____	0_____	S__
Always	Usually	Sometimes	Rarely	Never	
(100%)	(80%)	(50%)	(20%)	(<10%)	

13. Participates in activities.

4_____	3_____	2_____	1_____	0_____	S__
Always	Usually	Sometimes	Rarely	Never	
(100%)	(80%)	(50%)	(20%)	(<10%)	

14. Performs activities without frustration.

4_____	3_____	2_____	1_____	0_____	S__
Always	Usually	Sometimes	Rarely	Never	
(100%)	(80%)	(50%)	(20%)	(<10%)	

15. Continues an activity when frustrated.

4_____	3_____	2_____	1_____	0_____	S__
Always	Usually	Sometimes	Rarely	Never	
(100%)	(80%)	(50%)	(20%)	(<10%)	

16. Can identify familiar persons.

4_____	3_____	2_____	1_____	0_____	S__
Always	Usually	Sometimes	Rarely	Never	
(100%)	(80%)	(50%)	(20%)	(<10%)	

17. Initiates conversation with staff/residents.

4_____	3_____	2_____	1_____	0_____	S__
Always	Usually	Sometimes	Rarely	Never	
(100%)	(80%)	(50%)	(20%)	(<10%)	

18. Socializes when others initiate the interactions.

Always	Usually	Sometimes	Rarely	Never
(100%)	(80%)	(50%)	(20%)	(<10%)

19. Expresses him or herself appropriate to the situation.

4_____	3_____	2_____	1_____	0_____	S__
Always	Usually	Sometimes	Rarely	Never	
(100%)	(80%)	(50%)	(20%)	(<10%)	

20. Is able to make a decision when presented with choices.

4_____	3_____	2_____	1_____	0_____	S__
Always	Usually	Sometimes	Rarely	Never	
(100%)	(80%)	(50%)	(20%)	(<10%)	

21. Can learn a simple activity without difficulty ( stirring, wiping dishes).

4_____	3_____	2_____	1_____	0_____	S__
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Always	Usually	Sometimes	Rarely	Never
(100%)	(80%)	(50%)	(20%)	(<10%)

SubTotal T\_/11 S\_/11

Total Score: \_\_\_\_\_

Scoring: Total those marked according to the key on the side (defines the factors) You can use the task performance, social interaction, and problem solving scales separately or use a total score