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POTENTIAL IMPLICATIONS FOR MUSIC THERAPY ON NURSING ASSESSMENT OF  
PATIENTS WITH DEMENTIA IN HOSPICE

by

Kamilla Akmuradova

A thesis submitted to the Graduate College  
in partial fulfillment of the requirements  
for the degree of Master of Music  
School of Music  
Western Michigan University  
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# POTENTIAL IMPLICATIONS FOR MUSIC THERAPY ON NURSING ASSESSMENT OF PATIENTS WITH DEMENTIA IN HOSPICE

Kamilla Akmuradova, M.M.

Western Michigan University, 2019

Patients with Alzheimer's disease (AD) display symptoms that cause disturbances in memory, learning, language, motor ability, and behavior. Hospice medical professionals frequently experience difficulty when performing any treatment physical in nature, such as conducting a physical assessment, changing a wound dressing and wound care, and administering medications, since patients with (AD) often exhibit symptoms of agitation, anxiety, and combative behaviors before and during procedures. In addition, complex communication and cognitive impairments cause challenges with assessment and intervention planning. Music as a complex auditory modality can enhance state of alertness, physical movement, facial expressions, physiological responses (e.g., heart rate), and communication consequently improving assessment and treatment. This paper presents a collaboration of a music therapist with nurses to investigate the effects of collaborating professions co-treating versus standard care alone on people diagnosed with advanced Alzheimer's dementia on measures of consciousness, affect, cognition, verbal response, and agitation within a hospice setting. In addition, this project provides guidelines on the education of RNs on the application of music in their practice and an overview of hospice services, etiology and physiology of Alzheimer's disease, development of hospice music therapy, and thorough research of music therapy interventions.

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## INTRODUCTION

The United States has a large and expanding population of older adults. According to the most recent data available from Administration on Aging, persons 65 years of age or older represented 14.9% (47.8 million) of the US population in 2015 and are projected to more than double in population by 2060. Older adults on average account for 80% of home care visits and 90% of skilled nursing facility placements and have more office visits with doctors and overnight hospital stays than the younger population (Administration on Aging, 2015). One of the leading causes of cognitive disability and poor health in individuals over age 65 is Dementia, particularly Alzheimer's disease (AD), which is the most common type of dementia. (Alzheimer's Association). Alzheimer's is a degenerative disease of many cerebral functions and includes impairments in intellectual functions, memory, orientation, language, attention, executive functions and alterations in behavior.

Pathophysiological brain changes that lead to Alzheimer's disease are caused by trauma, vascular disease, infection, and progressive neurodegeneration and atherosclerosis (Storey, Levine, & Shega, 2008). Clinical manifestations of AD include memory loss, disorientation, loss of facial recognition, understanding language and expression of thought (Storey et al., 2008). Unfortunately, at the present moment no cure exists for progressive AD. The treatment goal is to identify pathogenic mechanisms causing the disease and delay the progression. Therapies focus toward maximizing the remaining capacities, restoring functions if possible, and controlling behavior changes. Medications exist to control delirium, depression, and hallucinations. The most essential components of supportive management are assisting families to understand the dementing process and caring for individuals (Storey et al., 2008).

The majority of patients during the end stage of the disease suffer from other chronic conditions. Due to that factor, many of these patients are prescribed seven to eight separate medications daily, mainly to target chronic conditions, behavioral symptoms, and manage pain (Tjia et al., 2010). Most patients require simultaneous use of several different medications because of the complexity of their preexisting medical and psychological conditions and to improve quality of life during the dying process (Lee, Bain, & Maio, 2007). With each additional medication prescribed, the patient is exposed to an increased risk of potential harmful side effects due to drug-drug interactions and/or drug-disease interactions (Lee et al., 2007). Medications that are commonly prescribed for patients at the end of life, such as psychotropic drugs, cardiovascular agents, and pain medications are commonly associated with higher risk of adverse side effects, such as: decreased activity level, hallucinations, increased risk for falls, confusion, drowsiness, constipation and respiratory depression (Lee et al., 2007).

AD patients receiving hospice care present with multiple complex symptoms. Impairments in cognition, receptive and expressive language, and increase in behavioral symptoms constitute unique challenges for hospice medical workers to provide quality care for patients with AD. Furthermore, determining pain and discomfort levels are difficult if not impossible. A few studies emphasized increased need for improved knowledge and skills and clearer policies when working with advanced dementia patients (Chang et al., 2009; Snow et al., 2004). Ryan, Gardiner, Bellamy, Gott, and Ingleton (2011) described medical team's experiences that were identified as "problematic" with respect to dementia patients. They stated that working with groups of people who are unable to report their symptoms, especially pain, experience confusion and difficulty communicating their needs, and those with behavioral challenges make the assessment practices and care management difficult. Another study (Chang et al., 2009)



echoed similar concerns in caring for individuals with advanced dementia. Their findings reported concerns about managing physical and behavioral symptoms, conducting accurate assessments especially for pain, and owing to the inability of people with advanced dementia to communicate their symptoms.

Music therapy is a non-invasive and non-language-based modality that can address various physical and behavioral symptoms, improve cognition and quality of life with no or minimum side-effects during medical procedures and personal care. Based on the research, patients show less agitation and anxiety during various medical procedures when partnered with music therapy (Cadwalader, Orellano, Tanguay, & Roshan, 2016; Karagozoglu, Tekyasar, & Yilmaz, 2013; Krout, 2000). Music therapy is one of the most widespread supportive therapies in hospice and palliative care. There is a growing body of evidence demonstrating the efficacy and benefits of music therapy in assisting with a variety of common end-of-life issues, with studies indicating the positive outcomes of music therapy. Clements-Cortes (2016) reported that music can increase awareness and exploration of emotional needs and stimulate physical and mental experience for the terminally ill. Davis and colleagues (1999) described how music therapy techniques can serve as a distraction to reduce the pain perception and as a relaxation prompt to increase oxygen supply, reduce muscular tension, and decrease older adults' anxiety or fear. Other areas music therapy has been impactful on individuals receiving hospice care include: reducing pain perception, muscle tension, anxiety, agitation, heart and respiratory rates, restlessness, and depressive symptoms; enhancing self-esteem, comfort and relaxation; increasing positive mood; and improving and/or facilitating communication with others; (Hilliard, 2003, 2005; Krout, 2001; Liu, 2015; McConnell, 2016; Payne Buse et al., 2017).

While there is a growing body of research with respect to music therapy as a music-based assessment in co-treatment with other disciplines in palliative care, it is not as extensive as music therapy literature in addressing patients' needs, caregiver support, and music therapy techniques at the end of life. Based on the existing research, we know that music therapy interventions can increase various functional domains and assist during procedures to address anxiety, discomfort and body tension in various medical settings. However, research evaluating the efficacy of music therapy and its impact on the quality of interdisciplinary assessment and services provided when working collaboratively for terminally ill patients in hospice setting is scarce. Krout (2004) discussed this phenomenon in his article expressing his personal experiences while working with other disciplines in coordinated visits. He observed that "...different disciplines can come together, play off each other, and interact dynamically...during the shared creative music between other team members, the patient, and me..." (Krout, 2004, p. 4). This experience was also substantiated in the extant literature by O'Kelly and Koffman (2007). A qualitative study explored the role of music therapy within the multidisciplinary palliative care team through in-depth interviews with 20 health professionals from five different hospices. They found that the health care professionals suggested that "the effectiveness of their own discipline had been enhanced by the music therapist's involvement, whether this was through 'opening up' the patients to discussing feelings with each other, or by enhancing the effectiveness of physiotherapy" (O'Kelly and Koffman, 2007, p. 239).

### **Preliminary Inquiry Related to Study Development**

The student researcher conducted a preliminary inquiry about utilization of music therapy in multidisciplinary sessions and attitudes toward its incorporation with multiple disciplines. Through personal experience, she observed that other disciplines perceived patients differently

when music/music therapy was present. For example, a Nurse Practitioner (NP) observed and conducted a pre-recertification assessment during a music therapy session with a hospice patient diagnosed with Alzheimer's disease. The patient was having a hard time allowing her to assess vital signs. With the addition of music therapy, the patient allowed for completion of the assessment, was more oriented to the session, showed less confusion when answering questions and showed no signs of agitation while actively participating in therapy. The NP stated she was curious and excited to observe the patient in a music therapy session. Her approach toward the patient was less "scientific" and more personal. When asked about her experience she stated that she was surprised by the patient's responses to music, since she mostly observed the patient sleeping. She added, that it felt as if through music we grew closer in relation and more connected. Then she added - "I still cannot believe the difference, it's almost as though it brings them back for a brief moment in time" (C. Donazzolo, personal communication, March 4, 2018). In another instance a social worker (SW) stated that she likes to coordinate visits with the music therapist because the music awakens patients in ways nothing else does. She said: "The music connects with something alive in their spirit. Your music opens the door for me to interact with them while they are in a good space. I felt like I could reach them in ways just talking could not" (L. Cambell, personal communication, March 5, 2018). This phenomenon resonates with Krout's words, where disciplines come together and connect during the treatment process.

This graduate thesis project has two functions. First, it can serve as a potential proposal for future research since a thorough method section has been included to determine the efficacy of music therapy on nursing assessment in hospice setting during a combined music therapy session with a standard nursing visit versus standard care alone in hospice. Second function of this paper was to guide music therapy professionals on the utilization of music therapy

interventions alongside care providers in the hospice setting and to educate care providers on utilization of patient-centered music in their clinical practice. This paper also seeks to provide an overview of hospice services, etiology and physiology of Alzheimer's disease, development of hospice music therapy, and thorough research of music therapy interventions in hospice.

## **LITERATURE REVIEW AND THEORETICAL FOUNDATIONS**

### **History Leading to the Development of Hospice**

Lifestyles, morals, values, spiritual and political beliefs all vary from one person to another, making them unique. As lives are all unique, deaths are also experienced individually. For some, the process of dying proceeds rapidly with little to no pain and discomfort; for others, dying is an exhausting and timely journey. While a curative form of medicine prevails in the world, palliative medicine continues to grow and expand as a recognized field in the United States at the end of life due to the increasing aging population.

When religion was threatening the scientific progress during the Renaissance, the focus on medicine to treat disease was established. It was during that time when the concept of separation of body from mind resulted in the long-standing medical slogan, believing that treating a disease can be separated from caring for the person who is suffering. Even to this day, despite apparent acceptance of the need for whole person care, the separation of mind and body continues to pervade medical practice.

Today's health care professionals are taught to provide quality treatment. However, the word "quality" is perceived differently between medical providers and patients. In a medical context "quality" has two dimensions- objective and subjective (Gerteis, 1993). Gerteis (1993) states that the objective dimension of the word focuses on the skill and competence of professionals and the ability to accomplish what they are meant to accomplish, medical

procedures and diagnostics, reliably and effectively. The subjective dimension relates to the quality of human relationships: the perception of humans of illness, the sense of well-being, and the encounter with healthcare professionals and institutions. The modern hospice movement critiques the impersonal, medical, and technological-based treatment of dying patients and embraces the philosophy treatment to regard death as a normal and natural part of life. The term palliative care refers to care for the whole person for patients who are experiencing a life-threatening disease or a debilitating chronic illness (Storey, Levine, & Shega, 2008).

Palliative care entails both the objective and subjective experience of the patient. Instead of focusing solely on treatment and eradication of the disease, the palliative model of care recognizes the importance of symptom management, relief of suffering, and support for the best quality of life for both patients and their families to make the illness more humane. The terms palliative care and hospice care are often used interchangeably in the medical field and are referred to the same approach of care, though this is a misconception. The difference between palliative and hospice is that palliative care allows a person to seek curative and aggressive treatment and does not entail a 6 month life expectancy, while in hospice care one comes to terms that curative treatment is no longer an option, and an individual has a life expectancy of six month or less (Hilliard, 2005). Palliative and hospice care is provided in residential settings, such as private homes, hospice centers, skilled nursing facilities, assisted living facilities, nursing homes and other long-term care facilities.

The origin of the modern hospice movement started in the 20th century with a leading figure Dr. Cicely Saunders, a physician and social worker. In 1950s and 1960s Saunders gained interest in pain management and holistic care and began to implement an ancient hospice concept with modern day medical techniques to care for the dying. Saunders is credited with developing

the art and science of modern hospice care and was a founder of one of the hospices in the United Kingdom, which soon became the model for other countries to follow. She established physician training programs to improve palliative care and formulated the basic principles of hospice care which used a "medical model" that recognized the emotional, spiritual, and social aspects of care. In the mid-1960s, following Saunders philosophy, Dr. Elisabeth Kubler- Ross motivated the growth of hospice care across the United States (Hilliard, 2005; Storey et al., 2008). Through interviews with patients and medical professionals, Kubler- Ross introduced death in a more approachable and predictable manner (Hilliard, 2005). Thanks to her work, hospices and palliative care units were opening and providing services throughout the US and Canada (Hilliard, 2005; Storey et al., 2008).

The hospice industry grew considerably after the enactment of Medicare services in 1982, especially after Medicare reimbursement rates increased by 20% in 1989 (Miller, Lima, & Mitchell, 2010). Medicare hospice benefits more than doubled since 2000. During this time, hospice went beyond caring for those with cancer to include all patients with life threatening illnesses, such as end-stage cardiac and pulmonary disease, advanced dementia, and other neurological conditions (Miller et al., 2010; O'Mahony et al., 2008).

In addition to their physical illness, patients with a terminal diagnosis present with various emotional and behavioral symptoms. Allen (2013) states that patients with deficits in physical, psychological, social, spiritual, and economic domains may exhibit negative symptoms and, in many cases, result in intensified trauma and suffering. Physical symptoms like nausea, pain, fatigue, and muscle tension are very frequently encountered and can be quite debilitating, interrupting day-to-day activities. The most common psychological symptoms include fear, stress, depression, anger, and anxiety. Emotional repercussions may include feelings of

hopelessness and changes in self-esteem and self-image. Changes in social status can be affected as well, causing isolation, difficulties in relationships, family, socialization, and other social environments (Allen, 2013). It is merely impossible to predict how individuals and their families will cope. Such complexity in symptoms and challenges in multiple domains are best addressed with a comprehensive multidisciplinary team of professionals.

Hospice services are provided by an interdisciplinary team to address the multifaceted sides of a disease. Such teams consist of doctors, nurses, social workers, chaplains (spiritual care), bereavement support, volunteer services, and adjunctive therapies (massage, music, aroma, pet, art, etc.). They provide expert medical care, pain management, and emotional and spiritual support specifically tailored to the patients' family members' needs.

Although, each member of the team has his or her own role in caring for the patient, professional roles often overlap (Hilliard, 2005). For example, a patient may be experiencing pain and emotional distress. A nurse identifies the issue and with the physician's approval prescribes medication for the pain. A nurse then refers a social worker to provide support and help identify appropriate coping skills for the emotional distress. During the psychosocial assessment, the social worker recognizes that the patient has a love for music and refers music therapy for additional support and non-pharmacological pain management. During a music therapy session, family expresses exhaustion for caring for the patient twenty-four hours a day. The music therapist requests the volunteer coordinator to refer a volunteer to allow the family a couple of hours of rest. The hospice team is most successful in addressing patient and family needs when members communicate and collaborate with each other (Hilliard, 2005).

## **Degenerative Dementias**

Over the lifespan, people show slow progressive decline in intellectual capability. Such decline is called normal cognitive aging (Grossman & Porth, 2013). Therefore, it is important to differentiate normal cognitive aging from disorders that affect memory and cognition. As Grossman & Porth (2013) stated short-term memory is usually well preserved during normal cognitive aging, although people do have more difficulty manipulating information. In terms of long-term memory, older people show impairment in the retrieval process. During normal cognitive aging the decline is not severe enough to interfere with normal life. In fact, many older adults lead fulfilling lives. Non-normative cognitive decline causes permanent damage to the areas of cerebral hemispheres or subcortical areas responsible for memory and learning.

Dementia is a disease of non-normative aging. The essential feature of dementia is impairment of short- and long-term memory. The disturbances in cognition are so severe that they interfere with activities of daily living (Grossman & Porth, 2013). People with dementia also lose the ability to think clearly and solve problems, perform normal activities, such as getting dressed and eating.

They also lose the ability to control their emotions and might exhibit personality changes.

Common forms of dementia are Alzheimer's disease, vascular dementia, frontotemporal dementia, Parkinson's disease, Huntington's disease, dementia with Lewy bodies, and Creutzfeldt-Jakob disease (Grossman & Porth, 2013). Alzheimer's disease (AD) is the most frequently occurring, and this research will focus on patients diagnosed with AD.

### **Alzheimer's Disease**

Alzheimer's Disease is a neurodegenerative terminal illness with an average life expectancy of four to seven years after diagnosis (Curtis, 2010). Dementia of the Alzheimer's disease occurs in middle or late life and is the most often occurring of all cases of dementia. One



in ten people age 65 and older were estimated to have AD in 2018 (Alzheimer's Association). The prevalence of the disorder increases with age and affects more than 5.7 million Americans. Based on the statistics by Alzheimer's Association, AD is one of the costliest conditions to society. The Alzheimer's Association's estimated direct costs for caring for individuals with AD in 2018 was \$277 billion, and numbers are projected to rise in future years. Patients with Alzheimer's very frequently present with behavioral disturbances. In 2011, Medicare Part D costs averaged \$7.6 billion for antipsychotic drugs, the second highest class of drugs, and accounted for 8.4% of Part D spending. Individual atypical antipsychotics average in price from \$100 to \$600 per month (Long, 2017). People with dementia have twice as many hospital stays per year and are more likely to have other chronic conditions than other older people (Alzheimer's Association, 2018).

After Medicare increased services to patients of noncancer diagnosis, patients enrolled in hospice with dementia diagnoses, specifically Alzheimer's disease, started to rise. This population accounts for 14.8 percent of all hospice patients, topping the non-cancer diagnoses (Concordance Healthcare Solutions). Alzheimer's disease is the 6th leading cause of death in the United States. Between 2000 and 2015, Alzheimer's disease related deaths increased 123%, while deaths from heart disease decreased by 11%. Alzheimer's disease is the only top ten cause of death in the United States that cannot be prevented, cured or even slowed (Alzheimer's Disease Association).

Alzheimer's disease has an insidious and progressive course. The disease progresses from mild short-term memory deficits, difficulty with language, changes in behavior to total decline in cognition and executive functioning. Pathophysiological aspects of Alzheimer's disease are characterized by changes to neurotransmitters, cortical atrophy and loss of neurons due to

amyloid plaques, and neurofibrillary tangles. Due to atrophy, there are ventricular enlargements from the loss of brain tissue (Carlson, 2013).

Various stages of the disease have been identified by the Alzheimer's Association. Progression of symptoms corresponds with the progression of underlying nerve cell degeneration (Joyce, 2015). In the first two to three years after onset, damage typically begins with cells involved in limbic system which is involved in learning and memory. Short term memory loss during this stage can easily be associated with normal forgetfulness that occurs in older adults. Although most older adults have difficulty recalling incidental information, adults with Alzheimer's randomly forget important and unimportant things. They may forget where things are placed, get lost easily, and have trouble performing novel tasks. About three to six years after onset, the disease gradually spreads to parietal lobe, which is responsible for critical thinking, judgement, and behavior. During the moderate stage, dramatic changes and increased impairments occur in cortical functioning impacting language, problem solving, and spatial relationships. Individuals may lose the ability to perform motor tasks, although the motor system remains intact, causing apraxia. Agnosia also may occur where patients are unable to identify or recognize objects despite intact sensory function. Misinterpretation of auditory and visual stimuli, extreme confusion, disorientation, disorganization of thoughts, and inability to carry out activities of daily living may also be evident during the moderate stage. Six to eight years after the onset, the damage affects cells in the late frontal lobe that control and coordinate movement. Motor disturbances such as walking, swallowing and moving may be evident. This stage is characterized by the complete loss of autonomy and ability to respond to the environment, even though sensation remains intact. Most people are bed bound and death occurs due to chronic debilitation (Grossman & Porth, 2013; Joyce, 2015). The Alzheimer's Association estimates that

between 2000 and 2015, deaths from AD have increased significantly while deaths from other major causes have decreased.

The diagnosis of Alzheimer's disease is based on clinical findings. There are no tests to confirm the disease. The actual confirmation of the diagnosis can only be obtained from microscopic examination of the tissue taken from a cerebral biopsy or at autopsy. There is no curative treatment for Alzheimer's dementia, though drugs can be used to slow down the progression of the disease and control behaviors symptoms and depression. Two major goals of care are to provide socialization and support for the family (Grossman & Porth, 2013).

### **Development of Music Therapy in Palliative Care**

Music and medicine have been linked together throughout history. In ancient times music was been used to alleviate suffering and anxiety (Light, Love, Benson, & Mörch, 1954). The value of music was recognized and accepted centuries ago, before the scientific or statistical study of its effects was made (Light et al., 1954). In the middle ages, music was played in hospitals in Cairo; Renaissance physicians used music as a preventative medicine; Baroque musicians wrote about the curative effects of music; and 17th century writings of music recount the beneficial effects on psychological functioning (Davis, Geller, & Thaut, 2008).

Development of music therapy techniques in palliative care began in the 1980s (Cortes, 2016). It primarily developed and expanded from music therapists describing therapeutic techniques and practices. There are four distinct types of music methods utilized with people receiving palliative care, ranging from passive to more active interventions which can be categorized as follows: receptive, improvisational (or creative), compositional, and re-creative (Brucia, 1998). Each category of experiences has its own unique characteristics and therapeutic applications. These methods engage in different interpersonal processes, involve a different set

of sensorimotor behaviors and cognitive skills, and evoke different kinds of emotions, therefore stimulating different areas of the brain (Brucia, 1998).

### **Receptive music therapy**

Receptive methods are common at the end-of-life. Patients frequently have discomfort, pain, and decreased energy levels, requiring more passive responses on the part of the patient such as listening to music (Clements-Cortés, 2016). Receptive methods include interventions encompassing music listening, lyric analysis, entrainment, and music and imagery (Brucia, 1998). Music listening involves a music therapist inviting the patient to select a song or the music therapist choosing the song for the patient based on the patient's cultural, personal values, or certain criteria, such as age. This receptive technique is an acceptable introduction to lyric discussion or simple relaxation (Bruscia, 1998). Lyric analysis involves listening to the chosen song with the patient and music therapist engaging in a discussion of the lyrics and their meaning afterwards. Lyric analysis allows for exploration of feelings and expression of thought. Entrainment requires a music therapist to match or manipulate patient's breathing pattern or heart rate for a desired outcome (Clements-Cortés, 2016). Entrainment is based on the isoprinciple, which is a technique that is matched with a mood of a client, and then gradually altered for a desired outcome (Davis et al., 2008). For example, to slow down rapid breathing the therapist begins by matching the breathing rate of the patient musically and gradually slows the tempo so that the patient's breathing will mimic the slower tempo (Clements-Cortés, 2016). Very often a music therapist takes the patient's heart rate before starting to play, to match the tempo of live music to the heart rate, which enhances the feeling of relaxation. Music and imagery and music and progressive muscle relaxation involve the music therapist providing either live, improvised or recorded music accompanied by a script depicting scenery, a journey, or other

imagery (Clements-Cortes, 2016). Progressive muscle relaxation includes directions on tensing and relaxing major muscle groups and deep breathing, which redirects focus to the body to decrease stress, anxiety, and pain perception.

Receptive music therapy is frequently used with patients diagnosed with dementia to address the behavioral and psychological symptoms. As dementia often presents with behaviors such as agitation, aggression and anxiety, extensive research demonstrates the benefits of receptive music therapy in relieving such behaviors. There is an extensive research showing benefits of receptive methods at the end of life. In meta-analysis by Pedersen, Andersen, Lugo, Andreassen, & Sütterlin, (2017), the results of 12 studies found active and receptive music therapy reduced anxiety, depression and agitated behavior displayed by people with dementia as well as improved cognitive functioning and quality of life. Raglio et al., (2015) examined the effects of active and receptive music therapy on behavioral and psychological symptoms of dementia and found that both methods reduced patients' negative behaviors related to the disease. A recent systematic review and meta-analysis by Tsoi et al., (2018) yielded interesting findings regarding active and receptive music therapies. They focused on evaluating effectiveness of receptive and active music therapy on caring for persons with dementia. In reviewing 38 trials involving the use of music therapy for 1,418 participants, they found that receptive music therapy significantly decreased agitation and behavioral problems compared to standard care alone, while no significant difference was found between active music therapy and standard care. This study suggested that individuals with dementia benefit more from receptive music therapy rather than from active music therapy interventions.

## **Creative music therapy**

Creative music therapy encompasses improvisational and compositional methods. Improvisational music therapy methods require a patient to create music extemporaneously, forming a melody, rhythm, or song (Bruscia, 1998). Improvisations can be instrumental and/or vocal, in a group setting or duet. Patients in hospice care often feel alone, misunderstood, isolated, confused and even neglected. Music improvisation is a modality for patients to express themselves in a nonverbal way that could lead to self-understanding and managing stress and tension. For the music therapist, it is a modality to build a relationship with the patient to start the healing process in a subtle, non-invasive manner. Clements-Cortes (2016) identified three kinds of improvisational techniques: empathetic, referential and active (Clements-Cortes, 2016). Empathetic improvisation involves the therapist designing an improvisation specifically tailored to the patient's current emotional or physical state. This improvisation allows patients to understand, experience and express their own emotions in a safe environment through music, instead of words. Empathetic improvisation serves as an outlet for negative feelings and emotions permitting patient to find relief and comfort. Referential improvisation is when therapist gives a verbal reference to base the improvisation on, such as a story, topic, person, event, or place. The music therapist or patient picks a referent that is expressed musically. Referential improvisation is more structured and can be used to introduce patients to the concept of improvisation and teach them how to express themselves based on the verbal reference (Bruscia, 1998; Clements-Cortes, 2016). Topics such as "illness", "healing", "dying" are difficult to conceptualize. Clements-Cortes states that conveying and expressing such concepts are easier through musical improvisation. In active improvisation, patients have more freedom to explore and express their emotions as it is the most unstructured way of musical expression.

Active improvisation allows the patient a way to explore creativity, express freedom, spontaneity, playfulness, develop interpersonal and group skills, and feel included (Bruscia, 1998). Active improvisation is most suitable for patients with dementia as it does not require complex cognitive and executive skills. Patients with dementia can typically keep the beat and follow musical cues like melody and rhythm naturally. Active improvisation stimulates their senses, cognition, and physical functioning.

Compositional music therapy refers to a process where a music therapist helps individuals write original lyrics, melodies, accompaniment, an instrumental piece, or poetry (Bruscia, 1998). This term also is used to describe the process of writing lyrics to pre-existing songs. Composition is an important tool for music therapists to use with patients in palliative care who have difficulty expressing their emotions (Bruscia, 1998; Clements-Cortes, 2016). When a music therapist engages a patient in a songwriting process, it allows him/her to externalize unexpressed feelings and thoughts, increase communication with family members, portray images, and/or create a lasting musical memory (Bruscia, 1998; O'Callaghan, 1997). O'Callaghan (1996) analyzed the lyrics of 64 songs written by 39 palliative care patients in music therapy sessions. Most songs were used by patients to express important messages, such as reflections about themselves, gratitude to other people, and memories. Other recurring themes were reflections upon patients' significant others, self-expression of adversity, imagery and prayers. It has been proposed that songwriting in music therapy may alleviate some of the physical, social, emotional or spiritual needs of patients in palliative care (O'Callaghan, 1996).

Lyric writing in palliative care closely resembles writing poetry. Poems are just one step away from becoming a song, as it just needs to be set to music (O'Callaghan, 1997). Process and

therapeutic outcomes of poetry are very similar to songwriting. Both provide opportunities to externalize thoughts, can be a vehicle for reminiscence and expression, and aid in exploration of grief and acceptance (O'Callaghan, 1997). Songwriting with patients with dementia or other cognitive deficits is used less frequently. If songwriting is implemented, it is likely more structured in nature. In this student researcher's professional experience, songwriting was usually implemented with patients with vascular dementia rather than with end-stage Alzheimer's. AD patients are more successful when invited to give concrete responses rather than explore abstract ideas. Techniques such as "fill-in the gap" at the end of a lyrical line or word substitution, re-writing a familiar song works well with patients with cognitive deficits.

### **Re-creative music therapy**

Re-creative music therapy involves patients reproducing or performing a precomposed piece of music, vocal or instrumental (Bruscia, 1998). Most often, re-creative experiences are vocal and instrumental in nature. Vocal interventions include singing, chanting, vocalizing to a melody, or learning and performing a vocal piece of music. Instrumental re-creative methods include playing or performing a precomposed piece of music using a musical instrument. Since re-creative experiences are highly structured and organized, they allow development of specific skills and behaviors on the part of the patient (Bruscia, 1998). Such interventions are utilized to achieve goals such as improving reality orientation and attention, stimulating memory, increasing communication, and stimulating verbalization. Vocal re-creative experiences allow terminally ill patients and their families to engage in meaningful interaction, initiate reminiscence, and express emotions (O'Callaghan, 1997). There are also physical benefits of therapeutic singing as it addresses breath control, maximizes oxygenation by engaging the



diaphragm, enhances physical relaxation, and reduces discomfort and anxiety (Clements-Cortes, 2016; Thaut, 2014).

Due to cognitive deficits experienced by patients with dementia, they are unable to reproduce a song with lyrics. Most often they are most successful in vocalizing to a melody on an open vowel or syllable or filling in words at the end of musical phrases with temporal and musical prompts. Re-creative instrumental experiences with patients with dementia at the end of life mostly focus on playing a percussive instrument with the therapist playing a pre-composed piece. Instrumental playing is a wonderful way to promote participation and increase focus. It promotes expression of feeling and enhances mood and quality of life (Clements-Cortes, 2016). Patients who are musicians and have maintained their ability to play an instrument should be encouraged to play that instrument since it increases self-identity and esteem, as long as playing does not interfere with their physical well-being and exacerbates pain or discomfort.

### **Combined music therapy**

Combined music therapy methods integrate music with different techniques such as movement, life review, and drawing or painting. Movement is rarely exercised with individuals on hospice services, especially with a population that experiences excessive cognitive deficits and are bed bound. Physical strength and ability to follow verbal and visual commands are usually ceased for individuals with late stage Alzheimer's disease. Contrary to this thought, Mathews, Clair, & Kosloski (2001) observed the effects of rhythmic music on the engagement of persons with early and moderate stages of dementia in an exercise regimen designed to maintain strength and flexibility. They found that people with dementia showed increased levels of participation in a series of 14 exercise activities when rhythmic recorded music was present.

A frequently used technique in music therapy is life review. It is a technique that allows clients to review significant events in their lives. This technique provides an opportunity to reflect upon their accomplishments, acknowledge and process regrets, draw conclusions, and come to acceptance (Clements-Cortes, 2016; Duffey, Somody, & Clifford, 2008). Duffey et al., (2008) acknowledged that the “process of life review is an important psychological task that involved making sense of a lived life” (Duffey et al., 2008, p. 48). She also suggests that conducting life reviews constitute important steps in coming to terms with unresolved conflicts, allowing people to find meaning in their lives, and finally finding peace of mind. Reminiscence is considered to be valuable and cost-effective when working with older adults (Duffey et al., 2008).

**Table 1**

*Music Therapy Methods Table (Modified from Clements-Cortés, 2016)*

Receptive	Creative	Re-creative	Combined
Music listening Lyric analysis Entrainment Music and imagery	Song writing Poetry Instrumental/vocal improvisation	Singing/chanting/vocalizing precomposed songs Playing precomposed instrumental piece	Music and movement Music and other art experiences Life review and reminiscence

### **Effects of Music Therapy in Hospice**

From the extensive reviews and studies, we know that people with neurodegenerative conditions, such as dementia, enjoy and respond to music therapy methods even in the late stages of the disease process. With the modern developments in imaging techniques and cognitive neuroscience research we can now better understand why people with neurodegenerative

diseases such as Alzheimer's dementia respond to music even when verbal communication has ceased. Additionally, such developments in neuroscience can explain differences and similarities between neural mechanisms involved in musical and nonmusical cognition. For example, mechanisms that drive cognitive processes in music such as attention and memory are also shared by equivalent processes in nonmusical cognition (Thaut, 2009). Brain research involving music has shown that music, as a high structured auditory language, stimulates the cognitive, sensorimotor, and affective processes of the brain, not just engage music-specific brain areas (Thaut, 2015).

Musical perception involves substantial memory capacity as it requires recognition of note sequencing, identification of rhythmic patterns, and harmonic structures. Music utilizes wide cortical and subcortical structures and different regions of the brain to perceive different aspects of music (Thaut, 2015). Functional-imaging studies by Peretz & Zatorre (2005) showed which areas of the human brain are involved when engaged by music. They indicated that pitch discrimination occurs in a region of the superior rostral temporal gyrus and lateral to the primary auditory cortex. The inferior frontal cortex is involved in recognition of harmony. Right auditory cortex is involved in perception of the strong underlying beat in music and left auditory cortex is involved in identification of rhythmic patterns. The cerebellum and basal ganglia are involved in timing of musical rhythms, as they are in the timing of movements. Motor changes are involved when singing or playing an instrument and auditory systems are involved recognizing changes in harmony, rhythm, and other elements of music (Carlson, 2013; by Peretz & Zatorre, 2015).

Brain areas affected by Alzheimer's disease are the ones that are implicated in memory function: medial temporal lobe, frontal lobe, and basal forebrain. For patients with dementia, memory for music appears to be intact even in the later stages of the disease (Cuddy & Duffin,

2005). Recent findings indicate that emotional stimuli engage specific cognitive and neural mechanisms that enhance explicit memory (Schultz, 2009).

Music has a unique ability to elicit memories and emotions. In many of his writings, Thaut (2010, 2015, 2014) mentions that our memories are strongly linked with our emotions. The stronger the emotion, the stronger the memory will be engraved in our brain. One of the areas of the brain that is strongly implicated in processing emotional stimuli is amygdala as it plays a particular role in creating and storing long term memories (Schultz, 2009).

Cuddy and Duffin (2005) found that in patients with severe Alzheimer's a mini-mental cognitive test with the score of eight was able to sing along to familiar melodies when verbal and writing abilities were completely impaired. Additionally, through behavioral observations the participant was able to respond to distorted familiar music with facial grimacing. They proposed that musical memories can survive longer than nonmusical memories and are accessible to persons with neurologic memory disorders possibly due to the fact that many subcortical structures needed for music perception are spared from the deterioration from the disease and stronger cortical areas may support and reinforce the weaker ones through 'co-activation' during music processing in Alzheimer's patients (Cuddy & Duffin, 2005; Thaut, 2010).

Research also shows that patients with Alzheimer's display significantly better recall of autobiographical memories after listening to familiar songs when compared to verbal directions or just silent conditions (Cuddy et al., 2015; Cuddy et al., 2017; El Haj et al., 2013). In El Haj et al., (2013) subjects produced more detailed memories during exposure to self-chosen music condition than to researcher-chosen music or during silence.

As mentioned previously, when engaged in music activities different cortical and subcortical areas of the brain are activated, stimulating non-musical functions. Gallega and

Garcia (2017) analyzed the effects of active music therapy on cognitive, psychological, and behavioral problems in patients with moderate and severe AD. They found positive changes in AD participants different functions. Behavioral symptoms, especially anxiety and depression, decreased significantly. Cognitive function, such as orientation and memory improved regardless of the severity of the disease. Language improvements were also observed, such as object naming, speech fluency and increased communication. Chu et al., (2014) conducted a study with 104 mild, moderate, and severe patients with Alzheimer's Disease to assess changes in memory, orientation, depression and anxiety. By pairing movement and instrumental play with rhythmic music, they observed significant changes in orientation to place and time, attention, short term memory, and language as measured by the Chinese version of Mini-Mental Examination and Cornell Scale of Depression. Significant decrease in anxiety was also found in participants with severe AD.

Individuals with dementia frequently exhibit behavioral symptoms of agitation, anxiety, restlessness that interfere with quality of life and daily living. The amygdala is believed to be involved in complex cognitive functions that influence overall emotion and behavior (Schultz, Castro, Bertolucci, 2009). It is speculated that such behaviors occur in the AD population due to a significant atrophy of the amygdala. A substantial amount of research focuses on music therapy and music listening effects related to outcomes on the behavioral and psychological symptoms of dementia, especially agitation and anxiety (Brotons & Pickett-Cooper, 1996; Gerdner & Swanson, 1993; Goddaer & Abraham 1994; Tabloski, Mckinnon-Howe, & Remington, 1995). Most of the studies found a significant decrease in agitated behaviors and a reduction in the recurrence of disruptive behaviors in individuals with late dementia.

Sakamoto et al., (2013) demonstrated that individuals with severe Alzheimer's disease benefited from receptive interventions as observed by decrease in behavioral symptoms, such as stress and anxiety levels and increase in positive facial emotions. The study also demonstrated increase in cognition as patients increased in memory recall. Clement et al., (2012) resonates with the findings of previous studies that music therapy interventions increase positive mood, facial expressions and "discourse valence" (Clement et al., 2012, p. 536). In addition, they also found that the effects of music therapy remained significant up to two weeks after the end of interventions on discourse valence and up to four weeks on mood. Raglio et al., (2015) conducted a systematic review to assess changes in mood and depressive symptoms in patients with neurological disorders after music therapy. The results were consistent with previous studies demonstrating that music stimulation can improve, mood (Clement et al., 2012), decrease agitation and anxiety (Gallega and Garcia, 2017), and verbal fluency (Chu et al., 2014; Sakamoto et al., 2013).

A number of articles report improved language and cognitive skills in patients with AD following a music therapy session. A study by Brotons and Koger (2000) compared the effects of music therapy to conversational sessions to see whether language improvements are merely a result of a simple interpersonal interaction with a therapist or the effects of music. Cognition, comprehension, repetition and naming were better following music therapy than conversational sessions with a therapist (Brotons and Koger, 2000). Bruer, Spitznagel, & Cloninger (2007) found temporary improvements in cognition the day after the music condition treatment for older adults with mild to moderate dementia. A meta-analysis study by Fusar Poli et al., (2018) focused on the effects of MT on patients with dementia cognitive functions. More specifically, they analyzed global cognition, complex attention, executive function, learning and memory,

language, and perceptual-motor skills. They found that in active music making where participants engaged in music production resulted in significant improvements in working and verbal memory. They also supported the idea that synchronized movement and external rhythm may increase cognitive function, and that music-based exercise may improve general cognition and verbal fluency in patients with dementia. Another study by Clair (1996) found that residents with late stage dementia living in residential care homes, who were no longer ambulatory and who no longer had discernible language displayed higher alert responses in head and eye movements, limb movements, changes in facial expressions, and vocalizations with unaccompanied singing than to reading and silence conditions.

Currently, research is growing to understand the observable changes to music therapy in patients who demonstrate poor arousal state, minimal motor response and significant cognitive and sensory impairments. Similar to AD, patients with disorders of consciousness (DOC) have complex clinical presentations in cognition, motor ability and compromised level of awareness to self and the environment (Magee, Siegert, Daveson, Lenton-Smith, & Taylor, 2014; Magee, Tillmann, Perrin, & Schnakers, 2016). Also, similar to patients with AD, accurate diagnosis of DOC is important for prognosis, treatment, and plan of care (Magee, Ghetti, & Moyer, 2015). Magee et al., (2014) developed a music therapy assessment tool for awareness in disorders of consciousness (MATADOC) as a measure for assessment of awareness that uses a music-based protocol to stimulate responsiveness in population with DOC. With the use of wide range of live musical stimuli behavioral responsiveness is rated across the motor, communication, arousal, visual, and auditory domains (Magee et al., 2014). Magee et al., 2014 stated that with the music therapist's ability to structure individualized music therapy experiences, and enable the manipulation of live music parameters, such as volume and pitch, one can gain a more accurate

picture of the patient's response with DOC. The purpose of the MATADOC is to contribute to interdisciplinary clinical assessments by providing a detailed assessment of auditory responsiveness of patients with DOC (Magee et al., 2014). With the good interrater and test-retest reliability, MATADOC is being used as an additional measure to a range of diagnostic assessments with the population with DOC.

Music as a complex auditory modality can enhance communication and cognition that cause challenges with assessment and intervention planning. Similar to MATADOC, which adds music to patient's assessment, the student music therapist of the present study proposes music-based assessment for patients with AD in hospice setting. Nurses express difficulty in obtaining current functional assessment due to individuals with severe AD having a decreased ability or inability to understand verbal language, and significant cognitive and sensory impairments, however their memory for music remains intact even long after their ability to process verbal language has ceased. This student researcher believes that the nursing assessment can be augmented by the qualitative behavioral observations of the patient during the music therapy session. This student music therapist proposes a collaboration of the music therapist with nurses to investigate the effects of music-based assessment on the collaborative treatment between professionals versus standard care of the nurse in hospice setting on patients with AD's levels of consciousness, affect, cognition, verbal response, and agitation.

### **Purpose of the Proposed Study**

The purpose of the proposed study is to investigate the effects of music therapy session with a combined nursing visit versus standard care alone (i.e., nursing visit) on consciousness, affect, cognition, verbal response, motor response and agitation with people diagnosed with Alzheimer's dementia as a primary diagnosis receiving hospice care. The proposed study seeks to



determine if integrated music therapy in hospice will facilitate and enhance previously mentioned functioning levels of patients and decrease agitation levels during provided nursing care consequently augmenting the nursing assessment. The researcher hypothesizes that measures of consciousness, affect, cognition, verbalization will be more robust and levels of agitation will be lower following the music therapy session when compared to outcomes of the control group as evidenced by a Modified Disability Rating Scale (MDRS), Level of Cognitive Functioning Scale (LCFS) and Agitation Behavior Scale (ABS).

### **Hypothesis**

Measures of consciousness, affect, cognition, verbal response, motor response and agitation will be more robust following the music therapy experimental treatment when compared to outcomes of the control condition as measured by Modified Disability Rating Scale (MDRS), Level of Cognitive Functioning Scale (LCFS) and Agitation Behavior Scale (ABS).

### **The null hypothesis**

There will be no change in the measures of consciousness, affect, cognition, verbal response, motor response and agitation following experimental session when compared to the control groups alone.

### **Research Questions (RQ)**

**RQ1.** Will there be a greater overall reduction in agitation between the experimental and control groups as measured by Agitation Behavior Scale (ABS)?

**H<sub>0</sub>1.** Music therapy will show no advantage in levels of agitation over standard care as measured by the ABS.

**H1:** Music therapy will result in reduced agitation as compared to standard care measured by ABS.

**RQ2:** Will agitation levels differ between the experimental and control groups during the nursing physical assessment?

**H2:** There will be no difference in measures of agitation during the nursing physical assessment between the experimental and control groups as measured by the ABS.

**H2:** Music therapy will result in decreased levels of agitation during the nursing physical assessment as compared to standard care measured by ABS.

**RQ3:** Will there be a greater observable pre-post change in consciousness, affect, cognition, verbal response, and motor response between experimental and control groups?

**H3:** Music therapy will show no advantage over standard care as measured by the LCFS.

**H3:** Music therapy will result in increased consciousness, affect, cognition, verbal response, and motor response as compared to standard care as measured by LCFS.

**RQ4:** Will integration of MT services allow RNs to obtain a more robust and comprehensive accurate functional status?

**H4:** Music therapy will show no advantage over standard care in obtaining a more robust and comprehensive accurate functional nursing assessment as measured by the LCFS and MDRS.

**H4:** Music therapy will result in a more comprehensive and robust functional nursing assessment over standard care as measured by the LCFS and MDRS.

## **METHOD**

### **Research Design**

This study will utilize a quasi-experimental within subject design, where the same participant will serve as his/her own baseline and undergo treatments of both experimental and control conditions. The experimental condition will include music therapy as part of the standard nursing visit. The control condition will consist of the routine nursing visit only. The order of the sessions will be randomly assigned.

### **Participants and Setting**

The study will be conducted with patients admitted to a Hospice in Grand Rapids, MI. Patients residing outside of the city limits will be recruited for inclusion in the study. The supporting documentation and permission of the hospice will be provided for the HSIRB review. Fifteen ( $n=15$ ) hospice participants primarily diagnosed with Alzheimer's disease by at least two physicians and given a prognosis of 6 months or less will be recruited for this research. All participants will be admitted to hospice with no previous experience in music therapy while on hospice services, who reside in nursing or assisted living facilities. Commonalities of participants' health status and cognitive functioning will be measured by the palliative performance scale (PPS), a Karnowski scale score of 50% or below, with dementia diagnoses measured by the Functional Assessment Staging Test (FAST) score of 7A by a medical professional. Criteria for participation will be: a) a terminal diagnosis of Alzheimer's disease; b) ages between 65-100 years; c) female or male; d) hospice physician's evaluation of subject's expected longevity of at least 3-4 weeks; e) Karnowski Scale and PPS scale of 50% and below; d) FAST scale score of 7A; f) participant's residence being a nursing or assisted living facility; g) no previous experience in hospice music therapy; h) patient is not actively dying; and i)

durable power of attorney (DPOA) has consented to the participant's engagement in the study and access of medical records, and verbal assent has been received from participants.

Participants with any primary diagnosis other than Alzheimer's dementia will be excluded from the study. Participants who have been confirmed by the RN to be in the process of actively dying will not be included into the study. Non-ambulatory, wheelchair or bed bound participants will not be excluded from the research, as long as the inclusion criteria are met.

### **Procedures**

Each participant will receive one experimental session and one control session. The total time of participation from the moment of obtaining informed consent from a participant will be between three to four weeks. Each session will not exceed one hour. The sessions will be spaced one week apart of each other. The overall length of the study will not exceed one year.

### **Recruitment**

After an admission into hospice services with a primary diagnosis of Alzheimer's disease, the patient will be reviewed by the case manager/admissions nurse for candidacy into the study. If the patient meets the inclusion criteria, the DPOA will be contacted by the music therapy investigator to seek consent.

### **Participant Assent**

If the participant is capable of providing affirmative agreement to participate, the investigator will explain the procedures, risks and benefits in a simple manner (See Appendix H). The individual with the late stage AD will assent to participation if capable or will not dissent, by not showing any signs of displeasure, verbal or physical contradiction. Candidates who meet inclusion criteria for participation will be randomly assigned to two sessions (control or experimental) by the SMT and RN, with a maximum of two weeks between measured sessions to

minimize the carryover effect. Participants and DPOA will be contacted within a week of being identified as an appropriate candidate based on the criteria by the RN. Randomization of sessions will be done by a nurse drawing a piece of paper with eyes closed out of a hat/bag with the word “experimental” or “control” written on it. Randomization of sessions will occur within a week of DPOA signing the consent form for participation. Each participant will undergo an experimental and control session. The experimental condition will include a standard music therapy session co-occurring during a standard routine care nursing visit, while the control condition will include only a standard routine nursing visit.

## **Experimental Condition**

### **Preliminary Music Therapy Assessment**

Prior to the experimental condition a preliminary baseline music therapy assessment will be conducted to obtain detailed information related to the participant’s history, dominant disruptive behavior, and music preferences. The music therapy assessment will be performed by a Board-Certified music therapist (MT) with six years of experience in the hospice setting, who is also the student investigator. Each participant will have one preliminary music therapy assessment session prior to the treatment condition. Music Therapy receptive (e.g. live music listening and entrainment) and re-creative (e.g. singing, music promoted reminiscence, and song choice) interventions will be utilized during the assessment. The music therapy assessment session will be completed 1-2 weeks prior to the experimental condition with consent from the DPOA. During the initial music therapy assessment, the music therapist will provide standard music therapy assessment (Appendix A) following the guidelines and procedures of the hospice.

### **Experimental Music Therapy Condition**

Efficacy of the experimental condition will be measured post-session by the RN re-administering the Modified Disability Rating Scale (MDRS), Agitated Behavior Scale (ABS), Level of Cognitive Functioning Scale (LCFS). During the experimental session the MT and the participants' RN will schedule a joint visit to conduct the experimental session. The words "music therapy" will be written on each assessment scale of the experimental session by the RN. The Music Therapist (MT) and RN will enter the room at the same time. The RN will assess the patient prior to the start of music using the MDRS, ABS, and LCFS scales. After the pre-measurements have been taken, the MT will provide only receptive music therapy interventions for about ten minutes before the RN starts the nursing assessment. The MT may implement some gentle tactile stimulation (e.g., therapeutic touch or rub on the shoulder/arm) only if participants does not respond to musical prompts and only if the tactile stimulation does not cause any discomfort to the patient. After ten minutes of music therapy, RN will begin the standard routine physical nursing assessment. Music therapist will co-treat and utilize standard care music therapy interventions to regulate participant's arousal state and stimulate the same functions as previously noted throughout RN's routine visit.

To ensure that treatment and control conditions will be delivered as intended, the music therapist and RN will remain the same for all aspects of each participant's study engagement. Qualifications for the music therapy interventionist include board-certification in music therapy with six years of professional experience in hospice and palliative care. The two RN each have at least 2 years of nursing experience in the hospice setting who will deliver nursing care within the scope of professional standard of practice, and in accordance with physician orders, center policies and procedures, and federal and state regulations and guidelines.

## **Music Stimulus**

Studies suggest that individuals with late stage dementia benefit more from receptive and re-creative music therapy interventions. Receptive music therapy interventions (e.g., music listening, lyric analysis, and entrainment) are frequently used with patients diagnosed with dementia to address the behavioral and psychological symptoms. As dementia is often presents with behaviors such as agitation, aggression and anxiety, receptive and re-creative music therapy have demonstrated to be effective in relieving such behaviors (Blackburn et al., 2014; Raglio et al., 2015); Tsoi et al., 2018).

Music therapy will be provided to participants through a cognitive-behavioral approach, where the therapist uses music and the therapeutic relationship to address the patient's needs with ongoing guidance and support. Based on the literature review, patience with AD best respond to receptive and re-creative music therapy interventions. Therefore, out of the four music therapy interventions identified in the review of literature, only receptive (e.g., live music listening and entrainment) and re-creative (singing along, and reminiscence) music therapy techniques will be utilized. Through the use of these interventions, the MT will promote health and well-being by providing clients with opportunities for communication, verbal and non-verbal self-expression; empathy, coping, and understanding.

All music therapy interventions will be delivered in a patient's private or semi-private room in a skilled nursing residential facility. The door into the room will be either slightly ajar or completely closed depending on patient's preference, privacy needs, and environmental sounds. The SMT investigator will be sitting by the bedside on the left or right side, directly facing the patient. If patient will be sitting at the table or in a wheelchair, MT will be sitting at his/her side at a 130-150-degree angle. All selected music will be chosen from patient's previous

music therapy assessment. The initial music/song will be selected by the student music therapist (SMT) as derived from patient's assessment and current mood. The mood will be determined in accordance with participant's state of arousal, general disposition, frame of mind, body language, facial expressions, and feeling. The song choice, elements of music (tempo, rhythm), loudness of the voice and guitar accompaniment (strumming, picking) will be manipulated depending on established short term goals and desired outcome within the session. For example, to increase a patient's arousal from a lethargic state, the SMT will select a set of patient preferred songs that will gradually increase in tempo, volume, energy, and complexity. The initial approach to choosing the music increases patient's trust in SMT and invites positive non-invasive collaboration between the patient and SMT.

During receptive live music listening with acoustic guitar accompaniment, SMT will invite the participant to select a song from two given choices based on the previous MT assessment. SMT will use Fender, nylon string acoustic guitar, model number CN 90 NAT. If the participant is unable to choose a song after being verbally prompted three times, SMT will choose for the participant. Selection of music will be estimated based on age, culture, and observable affective (smiles, grimaces), physical (movement) and musical (vocalization/singing) responses. To prompt participants in singing along/vocalizing, redirect his/her attention and increase eye-contact, SMT will utilize tactile stimulation in the form of therapeutic touch on the shoulder or hand. Temporal cues, such as timing, tempo, accents, and breaks in the melody, will also be utilized to increase participant's affective and cognitive states. Further engagement through use simple percussive instruments (shakers) will be used during the experimental condition. Lyric sheet will be available for SMT and participants if needed to encourage singing. Lyric discussion will be utilized to increase participant's verbalization and memory



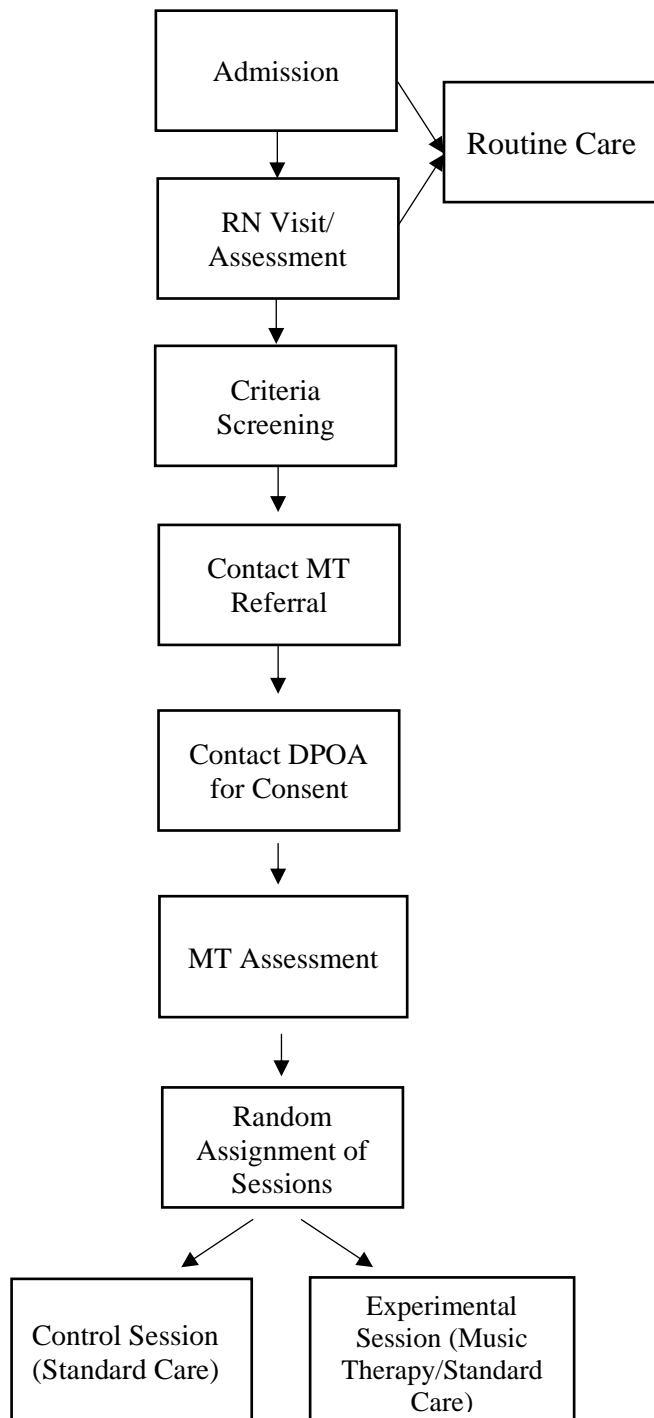
recall. If a participant experiences discomfort, pain, and decreased energy levels, more passive responses such as listening to instrumental music for entrainment to be utilized. The tempo of the music will be matched to the participant's heart or respiratory rate. Procedures for tailoring interventions to individual participants will be unique to that participant and derived from the initial assessment.

### **Control Condition**

The control condition will consist solely of an RN routine. Two RNs will be consented to participate in the study. As indicated in the Medicare guidelines, the RN sees patients on a weekly basis, though participants may receive a varying amount of nursing visits dependent on their needs. The standard care nursing session for the control condition will be one randomly selected visit before or one visit after the experimental session. Nurses will implement 1) MDRS to evaluate consciousness, eye opening, verbal response, and affect; 2) The ABS to measure levels of agitation; and 3) LCFS to measure levels of cognitive functioning. The RN will take the MDRS, ABS, and LCFS measurements before and after the control condition (physical nursing assessment). Agitation measures will also be taken during the nurse's vital signs assessment. There will be a total of two (2) measurements of MDRS, three (3) measurements of ABS, and two (2) measurements of LCFS during the control session. The Music Therapist will not be present during the control condition.

**Table 2**  
*Recruitment Chart*

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## **Measures**

### **Modified Disability Rating Scale (MDRS)**

The Modified Disability Rating Scale (MDRS) (See Appendix B) was developed for individuals with moderate and severe traumatic brain injury (TBI) (Wright, 2000). The scale is intended to measure general functional changes over the course of recovery. The first three items of the MDRS (eye opening, communication ability and motor response) are a slight modification of the Glasgow Coma Scale (Wright, 2000). Additional items (consciousness and affect) were added by the student researcher to reflect patient's changes in the course of the research sessions. Additionally, spontaneous response and rhythmic response to musical stimuli were added in "motor response" and "eye opening" sections. Cognitive ability for "feeding," "toileting" and "grooming" were excluded as they are not applicable in this research and do not reflect patients' abilities at end stage Alzheimer's disease. The scale will measure functional changes within the session in response to music stimuli and/or routine nursing visit. The scale ranges from 0 to 25, with a score of 0 (zero) indicating no disability, and a score of 25 indicating extreme disability or vegetative state.

### **The Agitated Behavior Scale (ABS)**

The ABS was originally developed as a series of agitation assessments during the acute recovery phase from an acquired brain injury (See Appendix C). An objective method for recording agitation was necessary in order to determine whether treatment interventions were effective (Bogner, Corrigan, Stange, & Rabold, 1999). ABS has a total of 14 items and allows medical professions to observe subtle changes in agitated behaviors. Each item is rated on a degree of severity, where one (1) ascribes that the behavior not present, and a rating of four (4) indicates the behavior being extreme. ABS has been studied for its validation with populations

other than patients recovering from acquired brain injury, such as measuring agitation in nursing home residents with Alzheimer's disease (Corrigan, Bogner, & Tabloski 1996; Tabloski et al., 1995). They found that the manifestation of agitation in Alzheimer's is similar to patients with acquired and traumatic brain injury. Therefore, ABS could be reliably used with other populations who experience an altered state of consciousness.

### **The Rancho Level of Cognitive Functioning Scale (LCFS)**

The LCFS is a scale used to assess cognitive functioning for brain injured patients (Sander, 2002) (See Appendix D). There is a total of eight levels, ranging from “no response” (level I) to “purposeful, appropriate response” (level VIII). Medical professionals classify patients into one of the categories based on their abilities, behavioral characteristics and cognitive deficits associated with brain injury. The scale is used in the planning of treatment, tracking recovery, and classifying outcome levels (Sander, 2002). The LCFS is widely used in the United States due to its simplicity and clinical utility (Hall, Bushnik, Lakisic-Kazazic, Wright, & Cantagallo, 2011). LCFS was originally designed for traumatic brain injury patients, and unfortunately no research was found for its use with Alzheimer's patients. One advantage of the LCFS is its ability to track and observe various responses without asking the patient to perform a set of specific tasks, such as repeating a set of words or naming objects.

### **RN Survey**

The investigator will conduct a short survey (See Appendix E) in order to clarify and enhance validity of the proposed research questions. At the conclusion of the study, the RNs will complete a short questionnaire to determine the most challenging aspects of caring for someone with end stage Alzheimer's disease and the strategies used to interact with the individual and manage agitation during routine care visit. RNs will also be queried on their personal responses

and experiences in collaborating with the music therapist, changes they observed in the patient as the result of music therapy interventions, and how individualized music therapy can be implemented to enhance the quality of RNs routine visit.

### **Proposed Analysis**

This study will use a crossover mixed method design, where all subjects will undergo both music (experimental) and standard care (nursing) sessions (control). The rationale being that if participants serve as their own control and are exposed to all levels of treatment, the design will provide a way of reducing the amount of error associated with individual differences. Use of counterbalanced assignment will be used to mitigate treatment effects. The results comparing progress between the experimental and control groups will be reported using both descriptive and inferential statistics. To determine if there is a statistically significant difference between group means a paired sample t-test will be conducted. T-Test will be carried out on the mean measures of each test- MDRS, ABS, and LCFS - to analyze the changes within and between groups. To determine significance between pre-post assessment scores for each of the MDRS, ABS, and LCFS tests, p-value will be calculated. Results from the exit survey will be reported descriptively.

### **PROPOSAL OF GUIDELINES ON EDUCATING RN'S ON THE USE OF RECORDED MUSIC IN THEIR PRACTICE**

There is a growing interest and use of music among medical staff in conjunction with standard care in residential facilities. However, the amount of research exists that looks at the use of music by medical staff in order to manage behavioral symptoms in people with dementia in long-term care facilities is meager. One of the studies that was found was conducted in Taiwan (Sung, Chang, & Abbey, 2011). It explored nursing staffs' attitudes and use of music for older

people with dementia in long-term care facilities. Based on their findings, the majority of participants had a positive attitude towards music. However, out of 285 participants only 30 percent of nurses utilized music for residents with dementia in their practice. Based on the reviews, common reasons for not implementing music were lack of education on music implementation, misconception of music effects, understaffing, and lack of resources. This review was limited and did not elaborate under what conditions the music was used by a small number of nurses and the results or changes that were observed in patients. Moreover, this study misused the term music therapy, and applied it in variation with music utilization, which further shows the lack of education about music therapy.

Another study, by Gerdner (2005), evaluated the effectiveness of music on agitation when implemented by trained nursing home staff. Agitation was identified by Certified Nursing Assistants (CNAs) as the most frequent challenge the staff faced when caring for people with dementia. Individualized music was provided to residents by CNAs, who were trained on appropriate application of music before the resident's peak level of agitation. A significant reduction in overall agitation was observed and a majority of staff reported a reduction in agitation during the implementation of music. Furthermore, family and staff reported that the music served as an incentive for meaningful interaction with others.

The conceptual framework for this section was developed from a lack of research on the application of music by interdisciplinary staff in hospice setting, a lack of knowledge on the application of music by non-music therapy professionals, and the clinical observations from concerned and frustrated statements expressed by nurses in hospice setting and nursing home facilities when working with patients diagnosed with AD. Also, having not implemented the study, but to conform with the purpose of this project, this student music therapist plans to

translate her scholarship of the review of the literature to the professional practice to improve interdisciplinary relationships, and increase effective interactions between patients and staff. Even though the current project is focused on utilization of music and music therapy services with RNs, the following guidelines can be accessible and applicable to any profession and caregiver who wishes to employ music in their practice.

One may ask, why should RNs utilize music in their service when hospice employs a music therapist. Music therapists should not be possessive of music. It is a free form of art that if utilized appropriately could benefit many. There are between 80-100 patients on hospice services depending on an organization, and most hospices employ only one full time and one part time music therapist. If census exceeds 100 patients, a hospice may employ two or more music therapists. One full time music therapist has a load of 40 to 70 patients. It becomes an ethical issue, when there are more patients on services who can benefit from music therapy services than one or two music therapists can serve. We, as music therapists, are physically unable to see each and every patient. Music therapists cannot be there every time a nurse believes that a patient can benefit from a joint visit. Plus, when a nurse conducts a physical assessment on a patient with agitation or combative behaviors, it is our duty as a supportive team member to inform him/her of a medium that can manage or decrease those behavioral symptoms and make the assessment process easier not just for the RN but also for the patient's quality of life.

It is of vital importance to stress that this proposal of expanding music to other disciplines is not meant to educate interdisciplinary services on utilization of *music therapy interventions* in their practice, but on the *appropriate use of music* in their practice. The use of recorded music stimuli by non-music therapy disciplines differs greatly from music therapy professionals. This point needs to be clearly articulated to the non-music therapy disciplines

wishing to use music in their practice. Delivering music therapy interventions requires advanced clinical experience and competency in the clinical application of music. All music experiences that are delivered by a music therapist are primarily live in nature, although recorded music is seldomly used. The music stimuli used by music therapists, that is both meaningful and novel to the patient, is always aligned with the patient's physical presentation (e.g., breathing rate, mood, activity level), carefully controlled and manipulated depending on the desired outcome.

### **In-service**

The first step in educating RNs on the use of music must come from a theoretical standpoint. An in-service must be provided to the clinical team on the use of music and its benefits. During that in-service the music therapist is suggested to include, but not limited to, the following information: physiology of music, assessment of musical preference, potential risks, music during a procedure, music to decrease agitation, music to stimulate alertness and cognition, music for relaxation. It is necessary to advise nursing staff to document the assessment results in the progress notes stating that *provided treatment and assessments were taken during music condition and may not represent the patient's baseline*.

### **Physiology of Music**

Music is a powerful tool that can cause physiological changes in an individual. Rhythm, timbre, tempo, dynamics, mode, and texture must all be taken into account, since all of these musical elements will have an effect on physiological (breathing and heart rate), psychological (agitation, anxiety), and emotional states of the patient.

### **Assessment of Music Preferences**

Prior to the RNs utilizing music in their practice a preliminary baseline music therapy assessment must be conducted to obtain detailed information related to the participant's history



and music preferences. The music therapy assessment must be performed by a Board-Certified music therapist (MT-BC), because RNs are not trained to operate within the Music Therapy scope of practice. Culture, ethnicity, and age are not the only parameters that must be considered. Patient with late stage Alzheimer's disease may not clearly report his or her favorite musical styles. Their subtle changes in facial responses (smiles, opening of the eyes, grimacing), physiological responses (breathing rate), motor movement (tapping of feet/hands), active participation (singing) will provide a better understanding of his or her preferred music. Nurses are not trained to recognize small changes in behavior when music is involved. All findings from the assessment must be accessible to RNs and interdisciplinary services. If possible, a list of preferred songs, genres, and styles will be created for each patient who can benefit from music being utilized by RNs. This step should not be an extra workload or burden on the part of the music therapist, since this information must be assessed and included in the patient's chart. If an RN requests assessment or guidance on how to implement music with a specific patient, then that patient becomes a candidate to receive music therapy while on hospice services.

### **Potential Risks**

If the assessment is done appropriately and music's power to influence human physiology has been explained, many risks can be avoided when music is implemented by a non-music therapist. For example, music with a fast and energetic tempo or pace, should not be offered if a patient has shortness of breath; loud music with thick instrumentation, a multiple number of musical instruments, may cause increased agitation and anxiety with people with AD.

### **Joint Visit**

When possible, to help the RNs feel more confident on the utilization of appropriate music with patients, music therapists can conduct a joint visit to guide the RN on how best utilize

music in his/her practice. All theoretical information that was introduced during an in-service, can be implemented in practice with the guidance from the music therapist.

## **Recommendations on the Appropriate Use of Music by RNs**

### **Music During a Procedure**

Procedure in this context is referred to the process of performing any treatment that is physical in nature, including but not limited to physical assessment, changing a wound dressing and wound care, providing personal care (bed bath, grooming, changing of undergarments), and administering medications. Patients with AD often exhibit agitation, anxiety, and combative behaviors before and during procedures. To decrease behaviors, the RN can play patient preferred music on the phone for five to seven minutes and engage in singing along for enhanced results or engage in a positive conversation while music is playing, which will in turn increase the patient's orientation. The RN should proceed with playing patient preferred music on the phone during the treatment and continue orienting the patient to the music or calm him/her with verbal prompts if necessary.

### **Music to Decrease Agitation and Anxiety**

As indicated in the literature review, the research shows that both active music making and passive engagement in music therapy interventions reduce agitation and anxiety (Raglio et al., 2015). This is one of the cases, where a music therapist's assessment helps evaluate whether active or receptive music can be more beneficial to alter patient's psychological and behavioral responses. When working on decreasing agitation and anxiety, the quality of music plays an important role. To decrease agitation and anxiety, active music making, such as singing simple familiar songs, preferably in a slow to moderate tempo with low volume must be utilized for

better results. No tactile or physical prompting should be implemented. Physical prompts, high volume, and heavy instrumentation may further exacerbate behavioral symptoms.

### **Music to Stimulate**

Re-creative music therapy interventions are utilized to achieve goals such as stimulating memory, improving orientation and attention, increasing eye contact, and verbalizations. The simplest recreative intervention that RNs can utilize to stimulate their patients through music is singing. One does not have to be a proficient singer or a musician to promote a response. Research shows that successful facilitators of response could even be achieved if familiar songs are sung without accompaniment, therefore family members, residential care staff, and third-party care providers may use singing to engage interaction at some level with persons in late stage dementia (Clair, 1996).

### **Music for Relaxation**

Receptive music therapy is frequently used with patients diagnosed with dementia to increase relaxation, peacefulness, and a supportive environment. RNs and other interdisciplinary team members can implement relaxing music for actively dying patients, during documentation to fill in the silence, or when the patient is relaxing by sleeping and no stimulatory interventions are necessary. Music that could be utilized during relaxation does not need to be patient preferred. Easy listening music that has a predictable rhythm (beat), no changes in harmony and dynamics, is monotonous and repetitive, and is preferably a solo instrument with an instrumental accompaniment or small ensemble can be successful in inducing a state of relaxation.

**Table 3**  
*Indications and Rationale*

Indications	Rationale
Music During a Procedure	Establishes supportive environment Distraction Reduces stress and combative behavior
Music to Decrease Agitation and Anxiety	Active/passive participation of simple, low volume, familiar songs No physical or tactile prompting OR see recommendations on the use of music for relaxation
Music to Stimulate	Stimulating memory Improving orientation and attention Increases eye contact and verbalization.
Music for Relaxation	Establishes supportive environment Enhances relaxation and feeling of peacefulness Release of tension

### **Pre-prepared Music Selections**

The same song can be played differently depending on the immediate need of the patient. The song “You are my Sunshine” can be played in up-beat tempo, with a strong baseline, and accompaniment to increase alertness, active participation, and energy in the patient. However, if the goal is to relax the patient, the same song can also be played in a quiet manner, with simple melodic accompaniment, or sang a cappella. The music therapist, therefore, should either record most well-received songs (e.g. folk, religious, big band and country western songs) or provide already made recordings by other musicians in contrasting styles for different applications depending on the desired results and make the recording accessible to RNs, and other team members. With new mobile technological advances, such as smartphones and tablets, RNs have

access to any song selection, all they need is the education on the appropriate use of music as a stimulus.

## **CONCLUSION**

Patients with Alzheimer's disease display symptoms that cause disturbances in memory, learning, language, motor ability, and behavior. Currently, society pays billions of dollars annually to care for the AD population. Behavioral disturbances, such as agitation, and inability to process verbal language make caring for AD individuals and interacting with them even harder as they cause stress, anxiety and can lower the quality of life even further. Use of music therapy as an environmental modifier has been one of the most frequently researched interventions and shown positive outcomes for managing anxiety associated with procedures, behavioral symptoms, and pain management (Cohen-Mansfield 2001).

Music Therapy is a nonpharmacological person-centered intervention and a low-cost alternative to medication which has been effective in reducing behavioral disturbances and psychological symptoms of dementia (Ray, 2017). The use of music therapy for behavioral symptoms of AD has been widely utilized and studied in observational trials for decades. As a nonpharmacological treatment it is recommended as an intervention to reduce behavioral symptoms (Brotons, 1996; Gerdner, 1993; Goddaer, 1994; Ray, 2017;), improve language and communication skills (Brotons and Koger, 2000), stimulate memory (Cuddy and Duffin, 2005), improve attention and motor ability (Fusar Poli et al., 2018), and enhance mood (Clements, 2012).

Based on the results of previous studies on the use of receptive and re-reactive methods of music therapy and its effects on behaviors that are impacted by AD, this music therapist believes that these interventions could be utilized effectively to subdue negative behavioral

symptoms and stimulate cognitive processes by MT in collaboration with RNs. Being a non-language way of expression, having “emotion-inducing properties” (Magee et al., 2014), and being linked with pleasure and reward systems (Carlson, 1994), music is well-placed as an additive assessment medium with the population with AD. This proposed study will investigate the effects and use of receptive and re-creative music therapy interventions on augmenting the quality and accuracy of RNs’ assessment during a combined nursing visit with individuals with moderate to severe dementia in hospice care. The student researcher believes that future findings of this research will have important implications for music therapy practitioners', long-term caregivers' and medical professionals' consideration of music therapy as a music-based assessment modality to enhance plan of care, manage behavioral symptoms and stimulate cognitive processes with a cognitively impaired population.

This study is designed as a single subject design, while it is accepted as an appropriate strategy for establishing efficacy of a new program and allows for each patient to serve as his or her own control, the actual future study should implement a no-treatment control group. The present proposal should also be conducted in a large-scale study that includes an appropriate control group. The Disability Rating scale (DRS) has been modified to better represent patients’ functioning levels in hospice setting and is not used for the diagnosing purposes in this proposed study. However, the future researcher may choose to utilize an original assessment scale. Additionally, the future research should be performed across a wider distribution of individuals diagnosed with different forms of dementias, socio-economic status, and racial groups.

The use of receptive music is sensory stimulating and based on the research, can be effectively utilized with people in late stage dementia who experience behavioral issues and are minimally stimulated in the hospice setting. Utilization of music can be taught to other

disciplines, and if used appropriately may yield promising results. Where many antipsychotic drugs increase lethargy and almost comatose state, music helps reduce behavioral symptoms without overmedicating the patient. Since receptive and recorded music has been found to be effective in managing behavioral symptoms and serve as a stimulating medium, the aim for music therapists should be to educate RNs and CNAs on the use of recorded preferred music before and during physical procedures such as vital signs assessment, wound changes, and personal care to prevent the occurrence of agitation and combative behaviors. Recorded and receptive music could be accessible to all persons who wish to use it, regardless of musical background and training. With this in mind, recorded and receptive music is a safe and low-cost intervention that could be successfully offered to patients in residential settings, such as skilled nursing facilities and can be utilized by caregivers, medical staff, and other support services.

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## **APPENDICES**

## Appendix A

### Music Therapy Assessment Form

Patient Name:	Date:
Diagnosis:	Age:
<b>MENTAL STATUS</b>	
<div style="display: flex; justify-content: space-around;"> <span>Alert</span> <span>Lethargic</span> <span>Sleeping</span> <span>Confused</span> <span>Forgetful</span> <span>Unresponsive</span> </div>	
<b>OBSERVED PRIOR TO SESSION</b>	
Pain: Worst 0 1 2 3 4 5 6 7 8 9 10 Best      Anxiety: Worst 0 1 2 3 4 5 6 7 8 9 10 Best Behavioral/Environmental Observations Prior to Session _____ _____ _____	
<b>PRESENTING PROBLEMS</b>	
<div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;">• Agitation</div> <div style="width: 50%;">• Dyspnea</div> <div style="width: 50%;">• Self-Expression</div> <div style="width: 50%;">• Loss of Independence</div> <div style="width: 50%;">• Anxiety</div> <div style="width: 50%;">• Emotional Issues</div> <div style="width: 50%;">• Disorientation</div> <div style="width: 50%;">• Communication</div> <div style="width: 50%;">• Aggression</div> <div style="width: 50%;">• Restlessness</div> <div style="width: 50%;">• Quality of life</div> <div style="width: 50%;">• Other</div> </div>	
<b>MUSIC BACKGROUND</b>	
<div style="display: flex; justify-content: space-around;"> <span>• Vocal</span> <span>• Played Instrument</span> <span>• Listener</span> <span>• Dancer</span> </div>	
<b>PREFERRED MUSIC</b>	
<div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;">• Religious/Spiritual</div> <div style="width: 50%;">• Country , Western</div> <div style="width: 50%;">• Big Band-Swing</div> <div style="width: 50%;">• Classical</div> <div style="width: 50%;">• Folk</div> <div style="width: 50%;">• Jazz/Blues</div> <div style="width: 50%;">• Old Time Popular</div> <div style="width: 50%;">• Popular 50 60 70 80 90</div> <div style="width: 50%;">• Other _____</div> </div>	

INTERVENTIONS	
<ul style="list-style-type: none"> <li>• Music listening</li> <li>• Improvisation</li> <li>• Imagery</li> <li>• Therapeutic Singing</li> <li>• Entrainment</li> <li>• Reminiscence</li> <li>• Lyric Analysis</li> <li>• Music and Relaxation</li> <li>• Instrument Play</li> <li>• Other _____</li> </ul>	
OBSERVED RESPONSE TO MUSIC THERAPY	
Pain: Worst 0 1 2 3 4 5 6 7 8 9 10 Best Response to Interventions _____ _____ _____	Anxiety: Worst 0 1 2 3 4 5 6 7 8 9 10 Best _____ _____ _____

## Appendix B

### Modified Disability Rating Scale

Aspect tested	Response	Score
Consciousness	Alert Drowsy Lethargic Obtunded Stuporous	0 1 2 3 4
Eye Opening	Spontaneous: eyes open with sleep/wake rhythms indicating active and arousal mechanisms; does not assume awareness.  To Speech, Music and/or Sensory Stimulation: a response to any verbal approach, whether spoken or shouted, not necessarily the command to open the eyes. Also, response to touch, mild pressure.  To pain: tested by a painful stimulus.  None: no eye opening even to painful stimulation.	0  1  2  3
Communication Ability	Oriented: implies awareness of self and the environment. Patient able to tell you a) who he is; b) where he is; c) why he is there; d) year; e) season; f) month; g) day; h) time of day.  Confused: attention can be held and patient responds to questions but responses are delayed and/or indicate varying degrees of disorientation and confusion.  Inappropriate: intelligible articulation but speech is used only in an exclamatory or random way (such as shouting and swearing); no sustained communication exchange is possible.  Incomprehensible: moaning, groaning or sounds without recognizable words; no consistent communication signs.  None: no sounds or communication signs from patient.	0  2  3  4  5

Affect	<p>Appropriate</p> <p>Flat</p> <p>Anxious</p> <p>Agitated/Restless</p> <p>Aggressive (verbal)</p> <p>Combative (physical)</p>	<p>0</p> <p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p>
Motor Response	<p>Obeying/: obeying command to move finger on best side.</p> <p>Spontaneous rhythmic movement to music.</p> <p>Localizing: a painful stimulus at more than one site causes a limb to move (even slightly) in an attempt to remove it. It is a deliberate motor act to move away from or remove the source of noxious stimulation.</p> <p>Withdrawing: any generalized movement away from a noxious stimulus that is more than a simple reflex response.</p> <p>Flexing: painful stimulation results in either flexion at the elbow, rapid withdrawal with abduction of the shoulder or a slow withdrawal with adduction of the shoulder. If there is confusion between flexing and withdrawing, then use pin prick on hands, then face.</p> <p>Extending: painful stimulation results in extension of the limb.</p> <p>None: no response can be elicited. Usually associated with hypotonia. Exclude spinal transection as an explanation of lack of response; be satisfied that an adequate stimulus has been applied.</p>	<p>0</p> <p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p>

## Appendix C

### Agitated Behavior Scale

Scoring: 1= absent; 2 = present to a slight degree; 3 = present to a moderate degree;  
4 = present to an extreme degree

#### Record a score for every behavior

- |   |       |
|---|-------|
| 1. Short attention span, easily distractibility, inability to concentrate | ----- |
| 2. Impulsive, impatient, low tolerance for pain or frustration            | ----- |
| 3. Uncooperative, resistant to care, demanding                            | ----- |
| 4. Violent and/or threatening voice toward people or property             | ----- |
| 5. Explosive and /or unpredictable anger                                  | ----- |
| 6. Rocking, rubbing, moaning or other self-stimulating behaviors          | ----- |
| 7. Pulling at tubes, restraints, etc.                                     | ----- |
| 8. Wandering from treatment areas   | ----- |
| 9. Restlessness, pacing, excessive movement                               | ----- |
| 10. Repetitive behavior, 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:**

*Agitated Behavior Scale (Baker et. al, 2010)*

## Appendix D

### Level of Cognitive Functioning Scale (LCFS)

____ (1) Level I	No Response: Total Assistance	Complete absence of observable change in behavior when presented with visual, auditory, tactile or painful stimuli.
____ (2) Level II	Generalized Response: Total Assistance	Responds to repeated auditory stimuli with increased or decreased activity; physiological changes generalized, gross body movement and/or not purposeful vocalization.
____ (3) Level III	Localized Response: Total Assistance	Patient responds specifically and inconsistently with delays to stimuli but may follow simple commands for motor action.
____ (4) Level IV	Confused, Agitated Response: Maximal Assistance	Alert. Patient exhibits bizarre, non- purposeful, incoherent or inappropriate behaviors, absent short-term recall, attention is short and nonselective. May perform motor activities such as sitting, reaching and walking but without any apparent purpose or upon another's request.
____ (5) Level V	Confused, Inappropriate, Non-agitated Response: Maximal Assistance	Patient gives random, fragmented, and non-purposeful responses to complex or unstructured stimuli. Simple commands are followed consistently, memory and selective attention are impaired, and new information is not retained.



_____ (6) Level VI	Confused, Appropriate Response: Moderate Assistance	Inconsistently oriented to time and place. Patient gives context appropriate, goal-directed responses, dependent upon external input for direction. There is carry-over for relearned, but not for new tasks, and recent memory problems persist. Consistently follows simple directions. Verbal expressions are appropriate in highly familiar and structured situations.
_____ (7) Level VII	Automatic, Appropriate Response: Minimal Assistance for Daily Living Skills	Consistently oriented to time and place. Patient behaves appropriately in familiar settings, performs daily routines automatically, and shows carry-over for new learning at lower than normal rates. Patient initiates social interactions, but judgment remains impaired.
_____ (8) Level VIII	Purposeful, Appropriate Response: Stand by Assistance	Patient oriented and responds to the environment but abstract reasoning abilities are decreased relative to premorbid levels.
Total		

*Level of Cognitive Functioning Scale (LCFS) (retrieved from <http://www.tbims.org/combi/lcfs> and <https://www.neuroskills.com/resources/rancho-los-amigos-revised.php>).*

## **Appendix E**

### **Nursing Questionnaire**

1. What is the most challenging aspect when caring for individuals with Alzheimer's disease?
2. What techniques do you usually use when conducting a routine assessment when a patient exhibits behavioral symptoms (i.e. agitation, anxiety, distressed vocalization).
3. What was your experience in co-treating with the music therapist during the nursing visit?
4. Was music therapy an intruding/aiding service during the nursing visit?
5. How did music therapy benefit/disadvantage the nursing visit/assessment/documentation?
6. Did music therapy aid you in interacting with the patient? If yes, how?
7. How can a music therapist and RN work together to enhance the quality of care for older adults in the end stages of dementia?

Comments:

## **Appendix F**

### **Participant Assent Script**

Hello [Pt's Name]. My name is Kamilla. I wanted to ask you if you would like to be part of my study. You will receive music therapy, during which we will play and sing your favorite songs. You are not required to do anything out of ordinary and there are no risks involved.