

Music Therapy for the Treatment of Agitation in Patients with Dementia

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Abstract

Purpose: This project therefore studied the effectiveness of music therapy as an intervention specifically for treating agitation in patients with dementia who resided in a long-term care facility. In addition, the effectiveness of music therapy using interactive forms wherein residents are invited to actively participate by singing and clapping hands along with the music, as active method of curbing agitation and uncooperative behavior.

Methodology: The music therapy intervention session took place in the recreational room. The duration of the music therapy intervention was thirty-minutes per session twice a week for a period of six weeks. Sixteen participants took part in the music therapy session. Participants' agitation was assessed with the Cohen-Mansfield Agitation Inventory (CMAI) three days before the music therapy session, every two weeks during the music therapy session, and two days after the music therapy session ends.

Results: The highest mean score indicated an increase in participants' behavioral symptoms and the lowest mean score indicated a decrease in participants' behavioral symptoms. Significant aggressive behavior was noted from pre-test ($M = 61.12$) with a decrease score during test ($M = 54.19$), ($M = 49.88$) and posttest ($M = 42.88$). A one-way repeated measured analysis of variance (ANOVA) was conducted to analyze the effect of music therapy to reduce the rate of aggressive behaviors. The results of the ANOVA indicated a significant time effect, (Wilks' Lambda = .03, $F(3,13) = 169.6$, $p < .01$, $\eta^2 = .98$).

Conclusion: It was statistically significant that the rate of aggressive incidents was decreased. The result of the music therapy for the treatment of agitation in patients with dementia contained evidence-based practice that promoted changes in clinical practice, healthcare policy, quality & safety, education, and economics.

Keywords: music therapy, dementia, long term care (LTC)



Introduction

Many factors can have a negative effect on health. Dementia is one of these factors. Dementia affects many aspects of a person's potentiality because it can modify the physical, mental, and emotional state of the human body. Goris, Ansel, and Schutte (2016) mentioned that dementia is characterized by a decline in behavioral, emotional and cognitive functions and is linked with social and physical problems. Snowden et al. (2017) described dementia as a chronic irreversible disease that progressively affects the cognitive function and interferes with activities of daily living. According to Sutin, Stephan, Luchetti, and Terracciano (2018), the clinical manifestations related to dementia can be grouped into a variety of symptoms such as memory loss and change in personality. A person with dementia may also display changes in behavior, including aggressiveness and irritability. Ray and Mittelman (2017) stated that depression, agitation, and wandering are the most likely behavioral symptoms found in patients with dementia and are observed among patients with dementia in nursing homes. According to the Office of Disease Prevention and Health Promotion, Healthy People 2020 defined social determinants of health as conditions in the environments in which people are born, live, learn, work, and play that affect a wide range of health, functioning, and quality of life (Office of Disease Prevention and Health Promotion, 2018).

To treat behavioral disturbances among patients with dementia, such as aggressiveness and agitation, pharmacological options have been prescribed for many years but antipsychotic medications may cause harm (de Kuijper, Evenhuis, Minderaa & Hoekstra, 2014; Højlund, Høgh, Bojesen, Munk-Jørgensen, & Stenager, 2018; Van Leeuwen et al., 2018). Antipsychotic medications are associated with severe metabolic side effects (Atti et al., 2014). However, medicine has also sought non-pharmacological options. One such option for addressing agitation



and improving the quality of life among those with dementia is music therapy. In many types of studies, music therapy has been scientifically shown to be effective in the reduction of the rate of aggressive behaviors (Ihara, Tompkins, Inoue, & Sonneman, 2019; Konno, Kang, & Makimoto, 2014; Shibazaki & Marshall, 2017). The American Music Therapy Association stated that music therapy involved a variety of interventions including singing, instrumental playing, and listening that can help patients reach the highest practicable physical, social, emotional, and cognitive function (American Music Therapy Association, 2017). Furthermore, Briggs (2011) suggested that music has a great power to affect emotions. It has been used in multiple ways, such as distraction from pain and for de-stressing as a therapeutic tool, and music has assisted patients across the lifespan, from newborns to older adults, and across the health continuum. This project studied the effects of music therapy in treating agitation in patients with dementia.

Background and Significance

Dementia is a broad term used for a syndrome that involves a slowly progressive cognitive decline referred to as chronic confusion. There are more than 100 diseases that can cause dementia (Dementia Australia Association, 2018). Alzheimer's dementia is the most common form of dementia. With dementia of all types, a general deterioration of intellectual function that is chronic and progressive occurs. This cognitive deterioration often exhibits in a decrease in attention, language and executive function (Smits et al., 2015).

Disruptive Behavioral Symptoms

Dementia patients also commonly display disruptive behavioral symptoms (Torrisi et al., 2017). Behavioral changes are linked to changes taking place in the brain from dementia and from environmental changes (Wong & Leland, 2016). One such behavior is agitation, referring to a variety of behavioral disturbances such as aggression, combativeness, and yelling (Holst &



Skär, 2017). These symptoms can originate in feelings of being upset or annoyed in both patients with dementia and caregivers. Older adults may experience frustration when they become dependent on others to perform their daily activities. The very fact of becoming dependent on others can have a negative effect on their life satisfaction. In general, disruptive behaviors are very painful for patients with dementia and a burden for caregivers (Cheng, 2017; Holst & Skär, 2017; Shu-Lin Uei, Huei-Chuan Sung, & Mei-Sang Yang, 2013). Caregivers of patients with dementia have disclosed that as dementia progresses, dementia patients become more and more aggressive (Kazui et al., 2016). As a consequence, the caregiver's workload becomes more difficult, and sometimes caregivers find it very challenging. This is especially so when dementia patients behave violently. Then, caregivers who manage this behavior on a daily basis often themselves experience stress and depression as a result (Holst & Skär, 2017).

According to Brown et al. (2012), agitation in later stages of dementia is described as the most significant symptom causing patient distress and caregiver burden (Brown et al., 2012). Disruptive behaviors among patients with dementia in long term care commonly occur during mealtimes. According to Keller et al. (2006), an estimated 30% of patients with dementia experience agitation during mealtimes and 22% resist assistance (Keller et al., 2006), thus putting patients with dementia at a higher risk of weight loss and dehydration.

Prevalence of Dementia

The prevalence of dementia among the elderly in the United States is a public health concern. There is a significant increase in both incidence and prevalence of Alzheimer's dementia after 65 years of age. According to the Alzheimer's Association (2019), the number of people in the United States with Alzheimer's type of dementia is estimated at 5.8 million



(Alzheimer's Association, 2019). That number is projected to increase to 13.8 million by the year 2050 (Hebert, Weuve, Scherr, & Evans, 2013, p. 1778).

The aging population is mostly affected by dementia's consequences. Patients with dementia are supposed to remain free from physical harm and not injure anyone else. However, many patients with dementia have the tendency to wander which can result in bodily injury and death; in long term care facilities wandering and agitation from dementia can produce negative outcomes such as falls, injuries, and possibly death (Beattie, Song, & Lagore, 2005; Sato et al., 2018). As a result, dementia is a burden for people who have the disease and on those who are taking care of patients with dementia.

Pharmacology Intervention and Side Effects

Antipsychotic medications are often a treatment option for emotional and behavioral symptoms in patients with dementia, such as hallucinations and agitations (Arai, 2016). While the use of drug therapy to decrease temporary behavioral symptoms has increased considerably, medications are not always an effective treatment and frequently have many adverse effects (Dennis et al., 2017). Sometimes these medications are even incorrectly given when professional healthcare workers use them as chemical restraints to decrease patients' mobility instead of for agitation, combativeness and restlessness (Foebel et al., 2016). What is more, in elderly dementia patients antipsychotic drugs can cause significant side effects, such as sedation, increased confusion, urinary retention, constipation, tardive dyskinesia, gait disturbances, falls, extrapyramidal symptoms, orthostatic hypotension, QT interval prolongation, cerebrovascular accidents, and increased mortality (Correll, Detraux, De Lepeleire, & De Hert, 2015; Kasew et al., 2019; Reutfors et al., 2016).

Concerns



Researchers around the globe are trying to find new ways to treat and prevent the onset of dementia. Non-pharmacological interventions have been suggested for managing the behavioral symptoms in patients with dementia. Some examples include recreational activities such as art, pet therapy, modifications to the environment such as designated quiet zones, and exercise, among others (Agency for Healthcare Research and Quality [AHRQ], 2014). Music therapy is another non-pharmacologic intervention (AHRQ, 2014). The definition of music therapy by the American Music Therapy Association (2017) is “the clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship.” Not only does music entertain, but it also has multiple beneficial effects on the physical, mental, and emotional state of the human body. Zare, Ebrahimi, and Birashk (2010) suggested that “music therapy seems to be the most effective to reduce agitations in patients with dementia and the least harmful of the non-pharmacology interventions” (p. 1310).

The scope of this project was the utilization of music therapy as a way to decrease disruptive behaviors among patients with dementia in a long-term care facility. Residents attended twelve sessions of music therapy, specifically two sessions per week over the course of six weeks. The Cohen Mansfield Agitation Inventory was used pre, during, and posttest to evaluate the effectiveness of music therapy on reducing dementia patients’ agitation.

Needs Assessment

The goal of Healthy People 2020 is to improve the population’s health through health promotion and prevention. Moreover, health promotion and prevention include evaluating people who are at risk of any disease that can be detrimental to their health, including dementia. It is important to point out that dementia is prevalent worldwide. Prince et al. (2013) noted that dementia is estimated to occur in 35.5 million people globally, and without treatment that



number will increase to 65.7 million by 2030 and 115.5 million by 2050 (p. 69). In the United States dementia is a public health issue. There is an estimated incidence of dementia in 4.8 million people, with the highest incidence in the south and east United States and the lowest prevalence in the north and west (Koller & Bynum, 2015). Moreover, “one in nine people aged 65 and older have dementia, and a third above 85 have dementia” (Hebert, Weuve, Scherr, & Evans, 2013, p. 23). As a result, there is an increased demand for long term care facilities where patients with dementia receive effective care and behavioral symptoms management. In 2013, patients with dementia constituted 39.6% of residents residing in long term care (Kojetin, Sengupa, Park-Lee, & Valverde, 2013).

There are many reasons for these behavioral changes and for patients with dementia to behave in a particular way. Behavioral changes may be related to cognitive changes and biochemical changes that take place in the brain, structural dysfunctions, or environmental factors (Wong & Leland, 2016). For some patients with dementia, emotional and behavioral problems can occur at the primary disease. Dementia patients may also experience paranoia (suspicious behaviors), delusions, hallucinations, and depression.

Many changes in personality, cognitive impairment, and disruptive behaviors are related to dementia although many other disorders related to drugs and environmental factors can produce changes in personality and combativeness as well. To obtain a complete history, healthcare providers must question family members or significant others for patient information because patients may be unaware of the problems, may deny their existence, or may cover them up. Wu and Orlando (2015) underscore the role of health assessments in providing an opportunity to focus on health promotion for individuals and populations. The most important element of the health assessment for dementia patients is the detailed collection of information



from the family to help assess common chronic conditions and other symptoms (Wu & Orlando, 2015, p.508).

Healthcare providers must also have a better knowledge of patients with dementia who live in the community in order to meet their expectations. The most important information to be obtained is the onset, duration, progression, and the course of dementia symptoms. A healthcare team may use strategies to engage the community to take an active part when it comes to their health. Furthermore, research has confirmed that the implementation of a community health assessment can improve people's health in the community by identifying people at risk and evaluating the effectiveness of health promotion. Healthcare providers can assess their ability to cope with the chronicity and progression of dementia and identify possible support systems. As Rabarison, Timsina, and Mays (2015) have suggested, implementation of a community health assessment and improvement plan leads to improved public health decision making and actions. (Rabarison, Timsina, & Mays, 2015, p.2531).

A significant number of people in long term care facilities suffer from dementia. According to the Centers for Disease Control and Prevention, there were 15,600 long-term care facilities in the United States, serving 1.3 million of residents from 2015 to 2016 (Centers for Disease Control and Prevention, 2016). Forty-two percent of individuals living in long-term care facilities have a diagnosis of dementia (Caffrey et al., 2012). Disruptive behaviors are the most difficult aspect of dementia with which families, significant others, and caregivers cope; these changes occur in advanced stages of the disease (Campana, Bonin-Guillaume, Yagoubi, Berbis, & Franqui, 2016). Researchers around the world are engaged in a continuous battle to find new ways to treat dementia and prevent its onset. Healthcare professionals and caregivers must use all available tools to address cognitive, emotional and behavioral symptoms associated with



dementia. In addition to medical treatments, non-medical treatments have also been proposed to manage behavioral symptoms. Music therapy is one non-medical treatment proposed for use in managing behavioral symptoms in patients with dementia who reside in a long-term care facility and display aggressive behaviors. This project was useful for the local Newark long term care facility wherein the proposed music therapy intervention was implemented to decrease behavioral symptoms and improve quality of life for patients with dementia. Moreover, reducing behavioral symptoms in patients with dementia decreased the possibility for patients with dementia to fall and to get injured. It was a cost-effective option to the pharmacological intervention. In one unit of this long-term care facility, 39% of patients have a diagnosis of dementia and display aggressive behavior.

SWOT Analysis

A SWOT analysis described the effect of internal and external factors including strengths, weakness, opportunities, and threats that could affect the music therapy session for the treatment of agitation in patients with dementia (see Appendix A).

Strengths. The most important strength for this study was the reduction of behavioral symptoms among dementia participants which improved their quality of life and decreased caregivers Workload. Reduction in the rate of agitation in participants can reduce the rate of fall, injuries, possibly death, and the rate of using psychotropic medications.

Weakness. One weakness of this study was the lack of knowledge on music therapy, and the lack of knowledge on low cost of music therapy for patients with dementia which could cause a resistance to practice change.



Opportunities. The opportunity of this study was public awareness of the effectiveness of music therapy to decrease the rate of aggressive behaviors, and to lower the use of psychotropic medication, fall, injuries.

Threats. The principal threat of this study was lack of motivation from healthcare staff members of the long-term care facility where the study took place.

Problem Statement

Dementia is a critical health issue in the United States where 4.8 million people have dementia (Koller & Bynum, 2015). The symptoms of dementia include cognitive impairment and psychological and behavioral changes. Patients with dementia begin to display major changes in emotional and behavioral affect as the disease progresses. The agitation and aggressive behaviors that are symptomatic and common among patients with dementia, no matter the type of dementia, can be especially problematic for the patient and for caregivers of those suffering from dementia. One reason is that agitation can manifest in violent behavior, making it especially challenging for caregivers to manage, whether a person with dementia is cared for at home or in a long-term care facility. Additionally, because dementia patients who display agitated and aggressive behaviors require intensive care and more care is needed as the population with dementia grows, the costs of providing appropriate care is also a concern. Pharmacologic and non-pharmacologic interventions to aid in the care of dementia patients both play a role, and research is studying more the use of non-pharmacologic interventions, such as music therapy, to treat aggressive behaviors in dementia patients and to improve their quality of life. The main focus of this project was to implement music therapy as a way to improve quality of life and to evaluate the effectiveness of music therapy in reducing behavioral symptoms such as agitation in patients with dementia who reside in long term care.



Clinical Question

In patients with dementia residing in long term care facilities, does the use of music therapy reduce the rate of aggressive incidents post therapy compared to the rate of agitated behaviors before receiving the music therapy intervention? The constituents of PICO contain population: patients with dementia that reside in long term care facilities. The intervention involves the incorporation of music therapy in their daily activities as a tool to reduce the incidence of aggression. The comparison is the absence of music therapy as a tool for the reduction of agitation in this population. The outcome is to reduce the incidence of aggression by improving the quality of life in patients with dementia and to reduce the caregiver's burden.

Aims and Objectives

The aim of the study was to investigate the effect of music therapy on behavioral symptoms such as aggressiveness as expressed by residents with dementia in a long-term care facility. Furthermore, the objective for this study was to measure quantitatively the efficacy of music therapy as a tool to decrease the incidence of aggressive behaviors and to improve the quality of life of patients with dementia. The quantitative measure was assessed with the Cohen-Mansfield Agitation Inventory (CMAI) tool, a tool that measured the frequency of agitated behaviors in elderly patients. The aim was to reduce by 20% of the behavioral symptoms of patients with dementia as measured by the CMAI tool.

Literature Review

Patients with all types of dementia exhibit many emotional and behavioral symptoms as the disease progresses. One difficult to manage symptom is agitation, which may manifest as aggressive, even violent, physical and verbal behavior and wandering. Aggressive behavior may occur more prevalently among older patients with dementia. Patients with dementia generally



have a severe disruption in quality of life mainly due to the behavioral and psychological symptoms of dementia. In all cases, agitated behavior is a challenging symptom for both the patient and the caregiver. Caregivers even report experiencing stress and depression. With the increasing number of people in the United States developing dementia, new and effective forms of intervention for agitated and aggressive behaviors among dementia patients is becoming more necessary. Antipsychotic medications are frequently used for aggressive behaviors, but forms of non-pharmacological intervention have also been used to manage aggressive behaviors in patients with dementia. Music therapy in patients with dementia is one such form of intervention. Moreover, music therapy is extensively used for patients whose medication interventions are not always effective and may lead to numerous side effects. Many researchers have found that music therapy appeared to be the most effective intervention for use in long term care settings (Arroyo-Anllo, Diaz, & Gil, 2013; Eells, 2014; Fukui, Arai, & Toyoshima, 2012; Lin et al., 2011).

A search for literature published in English from 2013 to 2019 on the use of music therapy to treat symptoms of dementia was conducted with the following databases: PubMed, CINAHL, ProQuest Nursing, and Cochrane Library. Keywords used in the search were the following: music therapy, dementia, agitation, nursing homes, and long-term care facilities.

A meta-analysis conducted by Chang et al. (2015) assessed the effectiveness of music therapy on disruptive behaviors, anxiety, depressive moods, and cognitive function in patients with dementia. This research pinpointed 1127 articles of which 294 were related to the study. Finally, ten articles from 294 were included in the meta-analysis after deep evaluation for eligibility where quantitative data, experimental and control groups were analyzed to evaluate the risk of bias in a randomized controlled trial meta-analysis was excluded. The meta-analysis data revealed the effect sizes which reflected the effect of music therapy in each study where



music therapy was statistically significant to improve behavioral symptoms ($g = -0.66$, 95% confidence interval (CI) = -0.44 to -0.88) and to improve anxiety ($g = -0.51$, 95% confidence interval (CI) = -0.02 to -1.00). Music therapy also had the potential to affect depression ($g = -0.39$, 95 % confidence interval (CI) = 0.01 to - 0.78) and cognitive function ($g = 0.19$, 95 % confidence interval (CI) = 0.45 to -0.08). The authors concluded that music therapy interventions appear to be effective and have the capacity to improve quality of life for patients with dementia (Chang et al., 2015).

Eun-Hi and Myonghwa (2015) also conducted an extensive systematic review and meta-analysis to explore the effectiveness of music therapy on agitation in patients with dementia. More than twelve electronic databases were used to find 1095 randomized controlled studies and randomized crossover studies. Ten studies were included according to the PRISMA flow diagram of screening and selection process. All ten studies were conducted in long term care settings. Participants were between 62 and 99 years old with a diagnosis of mild to severe dementia. Data from the systemic review and meta-analysis revealed that there was a significant reduction in agitation with an effect size of ($ES = -0.39$; 95 % confidence interval (CI) = -0.69 to -0.10, $p = 0.009$). The meta-analysis concluded that music therapy could be an effective nonpharmacologic intervention for patients with dementia in long term care (Eun & Myonghwa, 2015).

There was a similarity between both the Chang et al. (2015) and Eun and Myonghwa (2015) studies regarding music therapy in patients with dementia in long term care. Both studies indicated that music therapy can be effective to reduce behavioral and psychological symptoms in patients with dementia (Chang et al., 2015; Eun-Hi & Myonghwa, 2015). Both studies used the PRISMA flow diagram of screening for the selection process of randomized controlled trial



in long term care. Additionally, they had the same conclusion on the beneficial effect of music therapy to reduce agitation in patients with dementia who resided in long term care.

Vasionyte and Madison (2013) conducted a meta-analysis which involved the comparison between an experimental and a control group of patients with dementia in long term care who received different types of music therapy interventions such as active music therapy or passive music therapy. Active music therapy involved the incorporation of music therapy while participants were singing, dancing or playing musical instruments. Passive music therapy involved listening to music selected by the therapist or music selected according to the preference of the patients with dementia without singing, clapping, and dancing. The goal of the study was to assess the effects of different types of music therapy on behavioral and psychological problems that patients with dementia faced. Research of the literature provided ninety articles from more than ten academic databases. Nineteen articles were included according to the PRISMA criteria. Each of the nineteen articles used its own convenient tools such as Cohen-Mansfield Agitation Inventory (CMAI), Multidimensional Observation Scale for Elderly Subjects (MOSES), and Neuropsychiatric Inventory (NPI) to evaluate agitation in each group before and after using music therapy. The meta-analysis summarized all data from the nineteen articles and revealed that the types of music therapy used as an intervention did not matter. Rather, music therapy in any form was statically significant and homogeneous in improving the quality of life of patients with dementia with a mean effect size of (ES=1.04; 95 % confidence interval (CI) = 0.81 to 1.27). The authors concluded that music therapy interventions appeared to be effective to reduce behavioral symptoms in patients with dementia and had the potential to improve the quality of life for these patients. However, available data were



insufficient to conclude which types of music intervention were most effective (Vasionyte & Madison, 2013).

Antipsychotic medications have many side effects that can have a significant impact on a person's quality of life, including dizziness and fatigue, and increased falls or injuries. Blackburn and Bradshaw (2014) attempted to find non-medical intervention alternatives to antipsychotic medications such as music therapy to treat behavioral symptoms in patients with dementia. They conducted a critical review of six randomized controlled trial studies concerning the use of music therapy to improve cognitive function and quality of life and to decrease agitation in patients with dementia who lived in long-term care. Participants were over 65 years old with a diagnosis of dementia. The authors found that music therapy played a role in reducing anxiety, depression, and agitation, and in improving cognitive function. They concluded that music therapy can reduce psychological behaviors and improve cognitive function and quality of life when used in patients with dementia. Although this study supports the positive effect of music therapy on behavioral symptoms in patients with dementia, it did not indicate the amount of time that patients needed during each session to attain a maximum therapeutic benefit from the music therapy (Blackburn & Bradshaw, 2014).

More and more researchers are interested in the use of music therapy in patients with dementia. McDermott, Orrell, and Ridder (2014) studied how music can help patients with dementia to improve their quality of life. The main objective of this qualitative study was to understand the general opinion that family members, staffs, patients with dementia had about music therapy, but also to find out what positive effect music therapy had on patients with dementia. For the study, multiple sessions of music therapy were set up in different healthcare settings including hospitals and long-term care where patients with dementia were authorized to



participate. Family members and professional healthcare staff at the hospitals or long-term care facilities were interviewed after the end of the music therapy session to assess changes and responses that family members and staffs' members observed in patients with dementia. Family members and professional healthcare staff suggested music therapy could help patients with dementia in reducing behavioral and psychological symptoms after participating in a musical session by becoming relaxed, more social, and more cooperative with caregivers. Moreover, many of the patients with dementia had forgetfulness but were still able to remember their favorite songs and could reminisce about their past after listening to music. The study also showed that patients with dementia were able to become even more social with others by joining the music therapy session. The mood of most participants improved according to staff and family members. Music was shown to be more than just a tool to help reduce psychosis from dementia; it also had a deep meaning to many of the patients with dementia by bringing up memories from their past (McDermott et al., 2014).

Although there are multiple screening tools to evaluate agitation in patients with dementia, the Cohen-Mansfield Agitation Inventory (CMAI) is often used to assess agitation. According to Stoffel (2010), the Cohen-Mansfield Agitation Invention (CMAI) is a systematic appraisal scale with 29 questions on behaviors to assess agitation. Zare, Shayeghian, Birashk, and Ebrahim (2012) indicate that the (CMAI) is a valid and reliable tool for evaluating agitation. The two following studies were conducted in long term care using the CMAI.

Narme et al. (2014) conducted a study in a nursing home with patients with severe dementia to determine if music therapy would have beneficial effects compared to the non-musical control group. Thirty-seven patients in total participated and were randomly assigned; the control group had eighteen patients and an experimental group had nineteen patients.



Behavioral and psychological symptoms of dementia were assessed with the Cohen-Mansfield Agitation Inventory (CMAI) before and after the session of four weeks with one hour of music therapy twice a week. There was a significant difference in the music therapy group when data on agitation was collected at baseline with the CMAI before and after the music therapy session. The result was statistically significant with a decrease in agitation at the end of music therapy session ($Z = -2.9$, $p = 0.004$), compared to the baseline where no significant difference was found ($Z = -1.6$, $p = 0.1$). The authors concluded music therapy can significantly decrease agitation in patients with severe dementia and improve their quality of life (Narme et al., 2014).

Ridder, Stige, Qvale, and Gold (2013) conducted a study on a sample of forty-two participants with a diagnosis of moderate to severe dementia who resided in a long-term care facility. Agitated and aggressive behaviors such as self-hitting and physical aggression toward staff were observed during the study. Participants were randomly assigned. Twenty-one participants were assigned to the music therapy group and twenty-one to the control group. Music therapy was given to the experimental group biweekly for 30 minutes per session over a period of six weeks. The researchers used CMAI to assess agitated behaviors at baseline and after the six weeks of music therapy session. The frequency of agitation was measured by using the CMAI with an effect size of (-0.2) that revealed an increase of (0.46) in the control group, whereas there was a decrease of (-2.96) in the music therapy group. Most of the participants (69%) were female, and all of the participants were between 66 and 96 years old. There was an increase of (71%) in psychotropic medications for both groups at the beginning of the study due to agitation. Another increase of (17%) of psychotropic medications was reported in the control group before the end of the study while there was no increase in psychotropic medications for the music therapy group. A chi-square test was calculated and showed the use of psychotropic



medications to control agitation in the control group was statistically significant with ($\chi^2(1) = 5.14, p = 0.02$) in the control group. The authors concluded that six weeks of music therapy helped to decrease behavioral symptoms in patients with dementia and prevented an increase in the use of psychotropic medications in patients with dementia (Ridder et al., 2013).

Another study shows that music therapy is a beneficial form of non-pharmacological treatment and is less deleterious than other interventions. Vink et al. (2014) showed that music therapy improved the quality of life of patients with dementia by reducing neuropsychiatric symptoms such as hallucinations and agitation. For the research, a pool of ninety-four patients diagnosed with dementia was randomly allocated either to music therapy or general activities. Both groups had forty-seven participants. The music group received forty minutes of biweekly music therapy for a maximum of thirty-four sessions, and the general activities group received the same amount of recreational activities. The Neuropsychiatric Inventory Questionnaire (NPI-Q) was used to assess the severity (mild to severe) of neuropsychiatric symptoms such as agitation and hallucinations in both groups. At baseline, the symptoms in both groups were severe. At the end of the study, there was a statistically significant decrease in the NPI-Q scores among the music group with a value of ($F = 6.753, p = 0.01$) as compared to the general activities group. The authors concluded that patients with dementia who received music therapy had a decrease in neuropsychiatric symptoms NPI-Q scores lower as opposed to patients with dementia who received recreational activities (Vink et al., 2014).

Although many studies indicate that music therapy reduced behavioral and psychological symptoms in patients with dementia, most of these studies observed patients with mild to moderate dementia. Sakamoto et al. (2013) randomly assigned thirty-nine patients with severe dementia to two music therapy groups, one passive and one active, and a control group; each



group had 13 participants with severe dementia. For the music therapy groups, music therapy was given 30 minutes per week for 10 weeks. The passive music therapy group listened only to music while the active group listened but also sang, clapped their hands, and danced. Autonomic nerve index and the Face Scale were used to assess emotional and stress levels from both groups before and after the intervention of music therapy where the Face Scale ranged from 1 to 5. Additionally, a level of 5 from the Face Scale described a person who was extremely comfortable. Patients with dementia who received music therapy showed more comfortable moods of level 5 than those who did not receive music therapy. There was no significant mood comfortability in the control group from the data analysis of the Face Scale with a value of ($Z = -1.9$, $p = 0.6$). However, there was a significant mood comfortability in the passive and active groups with a value of ($Z = -2.3$, $p < 0.01$); ($Z = -3.2$, $p < 0.1$). The authors concluded that either passive or active music therapy can restore emotional states, and therefore music therapy may be useful for assisting patients with severe dementia in improving relationships with others and their quality of life (Sakamoto et al., 2013).

In contrast, to focus only on the quality of life improvement of patients with dementia, the following study focused on both quality of life improvement and affect. In a study by Sole, Mercadal-Brotons, Galati, and De Castro (2014), music therapy was shown to improve the quality of life and emotional wellbeing of elderly patients at various stages of dementia. Sixteen patients with dementia (fifteen women, one man) between 66 and 91 years old had been diagnosed with dementia for at least eight months. Those patients were selected to participate in the music therapy session for twelve weeks. The duration of each session was 40 to 60 minutes. The Global Deterioration Scale (GDS) and GENCAT were used during pre and post-test to evaluate cognitive function and quality of life on a scale ranging from mild to severe. The GDA



at baseline revealed nine participants had mild cognitive impairment (GDS three to four), five had moderate cognitive impairment (GDS five), and two had severe cognitive impairment (GDS six to seven). Data from the study revealed there was no significant improvement at the baseline with a value of ($z = -0.82$, $p = 0.41$). However, there was a significant improvement for emotional well-being with a value of ($z = -2.17$, $p = 0.03$). The authors concluded music therapy can help patients with dementia to improve their emotional well-being which can result in socialization between caregivers and patients with dementia (Sole, Mercadal-Brotons, Galati, & De Castro, 2014).

A non-experimental approach has hypothesized that music therapy can reduce behavioral problems among patients with dementia. According to Matthews (2015), music therapy is one of the approaches that can alleviate behavioral problems arising from patients with dementia and improve emotional well-being. Based on a case study of an elderly patient with severe dementia, Matthews' (2015) reported that when the elderly man was exposed to his favorite music, he became more and more sociable. Caregivers could approach him with no incidence of agitation, hitting, or spitting. Additionally, this patient with dementia not only could respond to questions but also could talk to his caregivers without displaying aggressive behaviors. The author concluded music keeps everyone involved and helps with social interaction with dementia patients. Even the simple act of listening to music can have positive effects on patients with dementia. However, more studies must focus on the most appropriate type of music that needs to be played during the therapy session (Matthews, 2015, p.575).

Theoretical Framework

The conceptual theoretical framework for the project was the Health Promotion Model (HPM) developed by Nola J. Pender. HPM considers "health as a positive dynamic state rather



than simply the absence of disease” (Petiprin, 2016). It also considers patients as multifaceted and unique individuals who interact and engage with their environment uniquely in their efforts to achieve health (Petiprin, 2016). Indeed, as Pender describes it, the philosophical foundation of the model is the “Reciprocal Interaction World View in which humans are viewed holistically, but parts can be studied in the context of the whole. Human beings interact with their environment and shape it to meet their needs and goals” (Pender, 2011, p. 2). Accordingly, HPM assumes that individuals have agency in achieving health, that is, that they play a central role in their health outcomes. It further assumes that nurses play a significant role in helping an individual modify his or her behavior in order to achieve optimal health (Pender, 2011). Ultimately, HPM encourages behavior that promotes positive health outcomes, as the name “health promotion” suggests, such as improved well-being and quality of life and an increased sense of productivity (Petiprin, 2016).

Specifically, Pender’s HPM framework explains that there are several factors which have a direct impact on a patient’s health outcomes (Ho & Dahlborg-Lyckhage, 2010). It focuses on three major components: individual experiences, behavior specific knowledge and affect, and behavioral outcomes. The main objective of the health promotion model is to assist people by helping them to accomplish the highest level of well-being and to pinpoint factors that affect health behaviors. According to the HPM, there are internal and external factors that can motivate patients to achieve their healthcare goals. Interpersonal influences are the interactions the patient has with others such as the healthcare providers, family, and friends who directly communicate and deal with the patient. Environmental influences are the stimuli from the patient’s immediate surroundings such as noise, level of lighting, and other stressors that directly affect the patient.



Music therapy is one of the external influences that can affect the environment for patients with dementia by setting the mood. Sakamoto et al. (2013) has shown that music therapy increased the mood level of patients with dementia by improving their emotional state (Sakamoto et al., 2013). Therefore, music has the power to calm and soothe those who have aggressive behaviors. In keeping with the Health Promotion Model, music therapy in a group session can help patients with dementia interact with others which can instill confidence in them and help them build social relationships by engaging with others in activities. According to the HPM framework, these environmental influences may have a positive impact that can help patients with dementia to decrease their anxiety and psychological distress. The aim of using the Health Promotion Model as a theoretical framework was to provide direct knowledge by linking manipulation of external factors with pertinent health outcomes through the use of music therapy (Appendix B).

Conclusion

In conclusion, there is more than reasonable evidence to suggest that music therapy has been significantly effective in improving disruptive behaviors with Hedges standard deviation of (95% CI -0.44 to -0.88, $g=-0.66$) than the control group (Chang et al., 2015). Furthermore, as McDermott, Orrell, and Ridder (2014) have stated, “the effects of music therapy go beyond the reduction of behavioral and psychological symptoms” (p. 706). Music therapy can also be used to decrease the use of psychotropic medications. As Ridder et al. (2013) have noted, not only does music therapy decrease behavioral symptoms such as agitation but also psychotropic medications were increase with an average of only 17 percent for patients with dementia who did not receive music therapy (Ridder et al., 2013). In addition, music therapy is safe because it does not have any side effects. It is a cost-effective alternative to the pharmacological approach and



the ill side effects of medications (Chang et al., 2015; Raglio, Filippi, Bellandi, & Stramba-Badiale, 2014).

The American Music Therapy Association (2017) lists the mean salary for a music therapist at \$57,797 in 2017. However, as Aigbogun, Stellhorn, Hartry, Baker, and Fillit, (2019) note, the average cost of psychotropic medications per person in 2015 was \$42,284 (Aigbogun et al., 2019) in comparison. As a result, the cost of psychotropic medications in a long-term care setting with multiple patients with dementia was considerably increase, making music therapy a more cost-effective approach than pharmacological treatment. The technique and method of music therapy intervention may be subjective, that is, either active music therapy or passive music therapy. Both methods of music therapy, however, can decrease agitation (Sakamoto et al., 2013). There is plenty of evidence to support the validity of adopting a conscious effort in implementing music therapy of some form into the everyday treatment of patients with dementia.

Methodology

Disruptive behaviors such as agitation are frequent in patients with dementia who reside in long term care facilities. This study consisted of the implementation of music therapy to reduce the rate of aggressive behaviors among patients with dementia in a long-term care facility. This section described the process of the implementation change in practice from the utilization of music therapy in patients with dementia in a long-term care facility. It included setting, population, sampling method, subject recruitment, consent procedure, risks/harms, subject costs and compensation, study intervention, outcomes to be measured, project timeline, and resources needed.

Setting



The six weeks of the research study took place in a local long-term care facility in Newark, NJ. The patients in this long-term care facility were White, African American, and Hispanic. The long-term care facility was divided into multiple units including acute, sub-acute, and long-term care. The patients in the long-term care units were totally dependent on others for activities of daily living. Healthcare professional staffs, such as certified nursing assistants, registered nurses, physical therapists, occupational therapists, and speech therapists, actively interact with patients in the long-term care unit. The environment was totally secure with 24 hours/7 days of supervision monitored by the professional healthcare staff to prevent wandering, elopement, and falls. Nursing care and management of medication were provided by professional healthcare staff. All social activities in the facility took place in the recreational room. Daily scheduled activities in the long-term care unit was reviewed to make sure the project was not conflicted with the long-term care unit daily activity. The permission letter to implement the music therapy project was approved by the administrator of the long-term care facility prior to implementation of the project (Appendix C).

Population

The population in question for this research study consisted of all male and female adult patients who had a diagnosis of dementia that reside in this long-term care facility at Newark. The diagnosis had to be made by patients' physicians, and this diagnosis had to be written in the patient's medical record. The sample for the project was a convenience sample because all the participants came from the long-term facility in Newark.

The long-term care unit was the unit where patients diagnosed with dementia, schizophrenia, and other psychotic disorders reside. The long-term care unit had forty patients. Approximately (39%) of the patients in the long-term unit had a diagnosis of dementia. Using



Raosoftware (2019) for the calculation of sample size, a sample of sixteen participants was needed in order to have a five percent margin of error and ninety-five percent confidence level based on population size. Therefore, sixteen patients with dementia were selected.

The criteria of the selection included adults, English speaking men and women who had a diagnosis of dementia with no concurrent psychiatric disorders such as schizophrenia or depression. Participants must be able to hear properly with no auditory problems in order to experience music therapy. Participants must also be free from medical conditions such as stroke or the inability to walk that can prevent them from taking part in the music therapy session. Excluded from the study were patients with dementia who also had medical conditions such as stroke, an inability to walk, and auditory problems as well as patients with dementia who did not have approval from family members or legal representatives. Moreover, patients with dementia who had concurrent psychiatric disorders such as schizophrenia and depression were excluded from the study.

Subject Recruitment

Two weeks were dedicated to the recruitment process. The recruitment process was conducted in person. Flyers were posted not only at the lobby but also at the long-term care unit so family members and residents can be made aware of the project before the recruitment. Two discussion meetings were scheduled with family members, healthcare professional staff, and patients in the long-term care unit by the DNP student on the effectiveness of music therapy on disruptive behaviors such as agitation. The dates of the discussion meetings were posted on the flyers. The flyers posted contained a brief overview of the two discussion meetings for family members, healthcare professional staff, and patients to see. Moreover, the DNP student contact information was posted on the flyers for further questions. The participants were informed of



their autonomy to participate in or to leave the study at any time. The participants were informed of their privacy protection through confidentiality and anonymity. The recruitment was made by the DNP student in the recreational room located in the long-term care unit on a scheduled day following the two discussion meetings. Recruitment materials are found in (Appendix D). After recruitment, family members and legal representatives of qualified participants for the study received a phone call from the DNP student to learn more about participants' music preferences and to discuss the consent procedure.

Consent Procedure

The project included sixteen participants. All sixteen participants' family members or legal representatives were informed verbally via telephone and in writing via their mailing address about informed consent. An informed consent must be obtained from family members or legal representatives of each participant before participants can assist in the music therapy session. However, in the event participant regained ability to consent the research study was designed to plan necessitated approach of consent discussion. The participant would meet with the study team once the situation was presented to confirm comprehension and appropriate consent form in order to continue voluntary participation in the study (Appendix E, F).

Risks/Harms

Safety played an important role when it came to participants' care. The ethical principle of beneficence, which was to prevent harm, was followed throughout this research study by ensuring participants' well-being. Harm could be prevented when the principle causes of harm were identified. Therefore, participants from this research study were free from harm because the only thing participants was receiving was music therapy which was inoffensive and harmless. No interventions other than music therapy was implemented during the research study. Moreover,



participants' routine medications were not withheld during the music therapy session. The recreational room, which was the room wherein participants were going to receive the session of music therapy, was free from any danger and was supervised by healthcare professional staff meaning nurses during each session. Each participant was escorted to his or her respective room after each session.

Subject Costs and Compensation

Participants were not coerced to take part in the music therapy session. Participants had the choice whether to take part in the research study. Participants may choose not to take part or may change their mind and to withdraw from the study at any time (Appendix F'). Participants did not receive any compensation such as money to take part in the music therapy session. However, light refreshment was given after each music therapy session.

Study Interventions

The music therapy intervention session took place in the recreational room. The duration of the music therapy intervention was thirty-minutes per session twice a week for a period of six weeks. Sixteen participants took part in the music therapy session. The session was active music therapy wherein the participants had the opportunity to listen to their favorite songs while singing and clapping their hands. Ray and Mittelman (2017), Sarkamo et al., (2014), and Vasionye and Madison (2013) reported that active music therapy improves the well-being of patients with dementia by increasing their quality of life and decreasing their agitation level.

The music therapy session was divided into three parts: pre-session, session, and post-session. The pre-session was the time when the DNP student set up the electronic devices (MP4 and speaker) in the recreational room before starting the music therapy session. For the session, the participants were invited to join the group music therapy session. The different types of



music for the group session were selected prior to the session according to participants' musical preferences. A three-minute introduction by the DNP student was made to greet and to invite the participants to sing, clap their hands while music plays. Song lyric was available to those who wanted to sing while the music played. The DNP student continued to engage participants to sing and clap hands throughout the music therapy session. In the post-session, the DNP student engaged in a soft reflection on the music therapy session by asking participants the following two questions: Did you enjoy the music therapy? Can you express yourself about the music therapy session? Light refreshment was shared with participants during this post-session. After the session, participants were taken back to their respective rooms by the professional healthcare staff.

Outcomes to be Measured

The Cohen-Mansfield Agitation Inventory (CMAI) short form was used to assess agitation. The CMAI is a fourteen-item questionnaire that was developed by Jiska Cohen-Mansfield to assess agitated behaviors in adult patients with dementia who resided in the long-term care setting. Permission to use the CMAI was obtained from the author. Caregivers of each participant were rated on those fourteen items based on a five-point frequency scale to assess participants' agitation level. It took only seven minutes to assess the agitated behaviors in one adult who had dementia when using the Cohen-Mansfield Agitation Inventory (CMAI) short form. The pre, during, and post period of the evaluation consisted of two hours each.

The CMAI has been used in many previous types of research to assess agitation. It was a valid and reliable tool. Zuidema et al. (2011) has pointed to the CMAI as a valid and reliable tool that has been used in many studies to assess agitated behavior in long term care. Participants' agitation were assessed with the CMAI three days before the music therapy session, every two



weeks during the music therapy session, and two days after the music therapy session ends. The IBM SPSS software was used to convert the scores for each patient with dementia into a percentage for data analysis (Appendix G & H).

Timeline

The initial procedure for selecting a proposal topic began in December 2018 in a meeting with the DNP student's professor. The topic was approved and entitled "Music Therapy for the Treatment of Agitation in Patients with Dementia" in January 2019. The process of the literature review started in mid-January 2019 followed by two meetings with the DNP student's advisor/professor. An appointment was scheduled with the chairperson at the end of January 2019. A total of 45 hours was assigned to gather and review the literature. A site visit of the long-term care facility at Newark in February 2019 took five hours with the administrator of the site to assess the target population (patients with dementia) and to discuss the need for music therapy for patients with dementia. Another two meetings were scheduled with the administrator for the permission letter. In the middle of February 2019, permission for project realization was granted by the administrator of the site. The three proposal parts were submitted between the end of February and mid-April 2019.

The proposal was submitted for approval to the Rutgers Biomedical Health Sciences (RBHS) Institutional Review Board (IRB) between July 2019. After receiving approval for implementation from RBHS IRB, the recruitment process began during the third week of January 2020. Implementation of the project occurred the fourth week of January. A total of twelve sessions of music therapy was conducted for the selected patients with dementia in the long-term care unit. Two sessions per week were dispensed. All sixteen participants had 30 minutes of music therapy per session. Data collection took place in March 2020 followed by data analysis.



Resources Needed

A personal budget from the DNP student was needed to finance the costs associated with this project. Purchases for the project included MP3 player, speaker, and flyers, binding of the final project, a statistician consultant, IBM SPSS software, and refreshments. An anticipated budget was placed in Appendix J.

Evaluation Plan

The project involved patients with dementia who received music therapy to decrease disruptive behaviors such as agitation. Family members and professional healthcare staff including nursing assistants and skilled nurses were the first line caregivers who had close contact with patients with dementia. Evaluation plan was conducted in one week after the end of the project. The DNP student not only used to work with patients with dementia in long-term care but also had completed the CITI program course completed the evaluation plan weekly for a period of one week. Evaluation of the plan resulted in the success of the project, that was, a reduction of the rate of agitation to improve quality of life.

Data Analysis

Descriptive statistics was used to describe the effectiveness of music therapy among patients with dementia who took part in the music therapy session. A small sample composed of sixteen patients with dementia was assessed pre, during, and post-intervention on their agitated behaviors frequency by using the CMAI tool. A parametric test was used for a small normally distributed sample. A Repeated measures ANOVA was conducted to determine whether there was a difference when comparing the mean score before, during, and after the intervention of music therapy. The IBM SPSS software was used for data analysis for each patient with dementia.



Maintenance and Security

After the collection and analysis of data by the DNP student, all information about the sixteen selected patients with dementia was kept strictly confidential according to IRB regulations. The DNP student assigned a number to each selected patient with dementia for data collection. Moreover, participants' personal information, such as date of birth, social security, and Medicare and Medicaid numbers, were not collected from their medical records for this project. Baseline assessment such as age, diagnosis, sex, ethnicity and data collection for evaluation of the project for each participant was coded with a number (see appendix L). Moreover, only the DNP student alone knew the information of the participants and the coded number that was attributed to each participant. All data collection was secured with a password on the electronic device that the DNP student used to collect and analyze data. The electronic device was used only for this project with no internet access in order to prevent hacking. All research activity was expected to stop at the end of March 2020 followed by the destruction all of participant information on the electronic device in accordance with Rutgers University guidelines.

Findings

The primary PICO question was: In patients with dementia residing in long term care, does the use of music therapy reduce the rate of aggressive incidents post therapy compared to the rate of agitated behaviors before receiving the music therapy intervention? findings from the study can be used to evaluate whether music therapy can be an excellent method to reduce the rate of aggressive behaviors among patients with dementia.

Demographics



The recruitment process was implemented after getting approval from RBHS IRB. A number of twenty-four participants were recruited to take part in the study. However, nineteen participants met the inclusion criteria as it was described at the beginning of the study and only sixteen were given consent from legal representatives to take part to the study. Baseline data was collected after completing the recruitment process. Most of the participants were males (10) with a percentage of 62.50%, and females (6) with a percentage of 37.50 % (Chart 1). Most of the participants were Black (14) with a percentage of 87.50 %, and Latino (2) with a percentage of 12.50 % (Chart 2). All the participants had a diagnosis of dementia at different stages. Six participants had moderate dementia with a percentage of 37.50 %. Five participants had mild dementia with a percentage of 31.25 %, and the rest of five participants had severe dementia with a percentage of 31.25 % (Chart 3).

Results Pre-Test, During Test, Post-Test

In order to analyze the effectiveness of music therapy on dementia participants, two methods were used in the SPSS. The first one was descriptive statistic by comparing the means and the standard deviations at multiple points of time of the study (pretest, during test, posttest) to see if there was significant difference in the average score within the same participants at different points of time. The second method was inferential statistical test which involved the use of repeated measure ANOVA to evaluate the difference within the same group when the data are normally distributed. These two tests allowed the investigator to evaluate if there was a significant difference in the rate of aggressive behavior from the beginning to the end of the study.

The descriptive statistics collected data of all participants at different points of time. These collected data provided a brief description of the participant through numerical analysis or



graphs (Figure 4 & 5). The chart 4 displayed different means that were collected before the implementation of the music therapy session, during the music therapy session, and after the music therapy session. The highest score indicated an increase in the behavioral symptoms of the participant and the lowest score indicated a decrease in the behavioral symptoms of the participants. The mean of the rate of aggressive behaviors was ($M = 61.12$) before the implementation of the music therapy session. A decrease of the rate of aggressive behaviors was seen two weeks after the implementation of the music therapy session with a mean of ($M = 54.19$). A decrease of behavioral symptoms has been indicated with a mean of 49.88 four weeks after the music therapy session. The rate of aggressive behaviors was decreased to a mean of ($M = 42.88$) in six weeks after the implementation of the music therapy session.

A profile plot depicted a correlation between the mean of participants' aggressive behaviors and the music therapy session (Figure 5). The profile plot displayed a negative correlation which was a relationship between two variables in which one variable increased as the other one decreased. The rate of aggressive behaviors went from ($M = 61.12$) to ($M = 42.88$). As the profile plot depicted it, the music therapy session was inversely related to the mean of aggressive behaviors, which meant that an increase in the number of the music therapy session lead to a decrease in the mean of participants' behavioral symptoms.

A one-way repeated measured analysis of variance (ANOVA) was conducted to analyze the effect of music therapy to reduce the rate of aggressive behaviors where the null hypothesis said there was no change in participants' behavioral score when measured before, during, and after participation in the study of music therapy session group ($N=16$). The results of the ANOVA indicated a significant time effect, (Wilks' Lambda = .03, $F(3,13) = 169.6$, $p < .01$, $\eta^2 = .98$). Thus, there was significant evidence to reject the null hypothesis (Figure 6).



Discussion

There were two possible limitations in the study regarding of music therapy for the treatment of agitation in patients with dementia. The first one was the sample size which was sixteen participants. Small sample size increased the risk of type II error. When increasing the sample size, the risk of type II could be reduced considerably. Further research should be performed with a larger sample size to reduce the risk of type II error. The second possible limitation was the lack of pluri-ethnicity from the study. Most of the participants were Black with a percentage of 87.50 %. Therefore, further study should have a wider distribution of racial groups. However, non-pharmacological options such as music therapy have also been used to address agitation and improve the quality of life among those with dementia. In many types of studies, music therapy has been scientifically shown to be effective in the reduction of the rate of aggressive behaviors, with both small and large groups, in both controlled and experimental test environments. These include studies using a variety of types of music played passively in the background during mealtimes, bathing, rest periods, and in social areas of long-term care facilities. Follow up comparisons from this research study indicated that each pairwise difference was significant, ($p < .01$) (Figure 7). There was a significant decrease in scores over time, implying that participation in the music therapy session group decreased participants' level of aggressive behaviors.

Implications

The conceptual theoretical framework used for this project was the Health Promotion Model. This model defines “health as a positive dynamic state rather than simply the absence of diseases” (Petiprin, 2016). Moreover, the Health Promotion Model had a positive impact on quality improvement by focusing on internal and external factors from the environment that



helped patients to achieve their healthcare goal. The result of the music therapy for the treatment of agitation in patients with dementia contained evidence-based practice that promoted changes in clinical practice, healthcare policy, quality & safety, education, and economics.

Clinical Practice

Agitation in patients with dementia has been frequent and included a variety of behavioral disturbances such as aggressiveness, both verbal and physical, and rapid mood swings. Fear and helplessness have also been observed in both patients and caregivers when dementia patients are experiencing these symptoms. Healthcare providers can use a complete history and physical assessment in the clinical setting in the community to improve health and to differentiate between changes in personality and disruptive behaviors that affect patients with dementia. A healthy environment including a clinical setting could be an essential place to educate family members and patients of the importance of music therapy as a source of non-pharmacological treatment to decrease aggressive behaviors. Community healthcare providers should educate the public based on evidence-based practice regarding the implementation of music therapy in the community to decrease the rate of aggressive behaviors among people who developed these aggressive symptoms. Even though the study was conducted in a long-term facility which was different from a clinical setting. However, clinicians can take advantage of the result to educate staffs and family on the effectiveness of the non-pharmacological treatment of music therapy.

Healthcare Policy

Healthcare policy is essential when it comes to people health. It is a set of regulations and rules that affect healthcare delivery. The main goal of these regulations is to deal with the health need of the population. According to the World Health Organization, “a well-functioning health



system working in harmony is built on having trained and motivated health workers, a well-maintained infrastructure, and a reliable supply of medicines and technologies, backed by adequate funding, strong health plans and evidence-based policies” (World Health Organization, 2019). After the completion of the twelve sessions of music therapy, it was noted that the rate of disruptive behaviors such as agitation was decreased in participants who received music therapy, compared to their agitated behaviors before receiving the music therapy intervention. Many previous studies have supported the use of music therapy to reduce agitation in patients with dementia (Ridder et al., 2013; Ueda, Suzukamo, Sato, & Izumi, 2013). Family members and professional healthcare staff at the long-term care site became more aware of the importance of music therapy to decrease agitation for patients with dementia. The professional healthcare would also take advantage of music therapy by implementing it in healthcare settings in order to decrease disruptive behavior and improve the quality of life of patients with dementia. Therefore, policymakers should take advantage of this project result as an evidence-based practice to improve the health of patients with dementia. They should be more proactive by doing more researches on non-pharmacological treatment (music therapy) to explore the benefit of music therapy on dementia patients.

Quality & Safety

Safety played an important role when it came to participants’ care. The ethical principle of beneficence, which was to prevent harm, was followed throughout this research study by ensuring participants’ well-being. Evidence-based practice has been the best way to change things not only in practice but also in different nursing domains. Nursing as a discipline of science and knowledge could take advantage of evidence-based to dispense the right knowledge that could bring the right changes. Pharmacology options such as antipsychotic medications have



been used to treat agitation in patients with dementia, but these medications have multiple side effects. Non-pharmacological options such as music therapy have also been used to address agitation and improve the quality of life among those with dementia. In many types of studies, music therapy has been scientifically shown to be effective in the reduction of the rate of aggressive behaviors, with both small and large groups, in both controlled and experimental test environments. This research project was designed to show that music therapy can be used as an intervention to decrease disruptive behaviors such as agitation in patients with dementia who resided in a long-term care facility. The only thing participants received to decrease agitation was music therapy which was safe. The only risk of receiving music therapy was some discomforts for sitting thirty minutes to listen to music therapy intervention. However, if participants want, they could stand up, clapping their hands. No interventions other than music therapy were implemented during the research study. As a result, the rate of aggressive behaviors went down, which increased the quality of life of these participants. It is a fact that music therapy can promote a healthy environment, promote patient safety, promote healing, and to improve the quality of care by decreasing the rate of aggressive behaviors.

Education

Living with dementia can have a big emotional, social, psychological and practical impact on a person. One critical impact is in the form agitation, a common symptom of all types of dementia. Caregivers have revealed that as dementia progresses, people with dementia become increasingly aggressive. Because the number of aged people with dementia is anticipated to increase from 44.4 million to 135.5 million by 2050 (Alzheimer's Disease International, 2013), interventions for agitation are critical. The result from this project should be shared not only for educative purpose but also music therapy influenced people in a holistic way. Being



healthy influenced people' body and had a positive effect in the connection and integration of the mind, body, and spirit. This research result had the possibility to promote health including the reduction of the rate of aggressive behaviors among dementia patients. Therefore, the result from this study can serve to educate or enlighten nursing profession, healthcare systems, and healthcare policy.

Economic

In addition to the physical and psychological effects of dementia on those suffering from it and their caregivers, dementia has a significant impact on healthcare costs, including direct and indirect medical and social services costs. The lifetime cost of intervention and management of patients with dementia has considerably increased from \$ 321,780 per person in 2015 to 350,174 in 2018 (Jutkowitz et al., 2017). This cost mostly impacts the healthcare system from patients with dementia who live at home or in long term care. Whether residing at home or in long term care, people with dementia display aggressive behaviors. Therefore, patients with dementia need more intensely skilled nurses and more supervision from nursing aids which requires an increase in the number of caregivers. As a result, an increase in financial resources is required to provide care. As Hurd, Martorell, Delavande, Mullen, and Langa (2014) have stated, a total of \$56,290 per person was claimed in 2010 from Medicare with a total of \$157 and \$215 billion in total for the whole year 2010. Overall, \$11 billion was reimbursed by Medicare in 2010 (Hurd, Martorell, Delavande, Mullen, & Langa, 2014).

Music therapy for the treatment of agitation in patients with dementia project shown that music therapy had miscellaneous advantage including reduce the rate of aggressive behaviors, improve the quality of life of patients with dementia, and it was cost effective investment. It was a fact that the costs associated to finance this project was so insignificant compared to the result



obtained, to the amount of money they used to spend for pharmaceutical treatment to control agitation in patients with dementia.

Sustainability

Knowledge is power, and power is education. Therefore, education is the most important weapon that people need. Education is vital for people future. In order to sustain this project result, it is imperative to maintain it through continued education. Nursing is a discipline of knowledge acquired through formal education and life experiences. Therefore, nursing is dealing with rapid changes in knowledge and practice. The result of this project will be available for public awareness in the form of articles and journals. NP students, healthcare agency, healthcare settings can always use information from this project to educate themselves. Moreover, information obtained from this study can be useful for future study.

Translation

Result obtained from this study will be presented during project presentation and poster day

Dissemination Plan

The results of this music therapy study for patients with dementia and any further recommendations for this research study would be available for public awareness in the form of articles and journals. The DNP student would present the findings and recommendations in speeches and presentations to healthcare agencies and organizations, as well as in healthcare settings including hospitals and long-term care and assisted living facilities.

Professional Reporting

The result of the research project will be shared for public awareness and professional healthcare organization in the form of publications and poster presentations



Future Scholarship

Public awareness is the first step for future scholarship. As a community nurse, my project will start at the lowest level in some local hospital, and then it can go statewide or nationwide. The “Music Therapy for the Treatment of Agitation in Patients with Dementia” project will be available for the public through submission in the form of article for the “Journal of the American Geriatrics Society”. It will be also available through presentation. People will have the chance to know how music therapy can influence behavioral symptoms in patients with dementia, and how patients with dementia reacted to music therapy. There will be a submission in the form of manuscript to the New Jersey League for Nursing. All have concluded that music therapy is indeed effective in one way or another. This project therefore studies the effectiveness of music therapy as an intervention specifically for treating agitation in patients with dementia.

Conclusion

The music therapy for the treatment of agitation in patients with dementia was implemented at the long-term facility for a period of six weeks. The music therapy session was twice a week for a period of thirty minutes per session. Sixteen participants with dementia from mild to severe took part in the study. The CMAI was used at the baseline to evaluate the rate of aggressive behaviors among participant, which showed that many of the participants were experienced aggressive behaviors. CMAI was used every two weeks and post music therapy session to assess behavioral symptoms. Information was collected for data analysis at the end of the music therapy session. It was statistically noted that the rate of aggressive incidents among patients with dementia was decreased progressively from the beginning to the end of the music therapy session. Therefore, music therapy can be integrated in the plan of care of patients with dementia to reduce the rate of aggressive behaviors.



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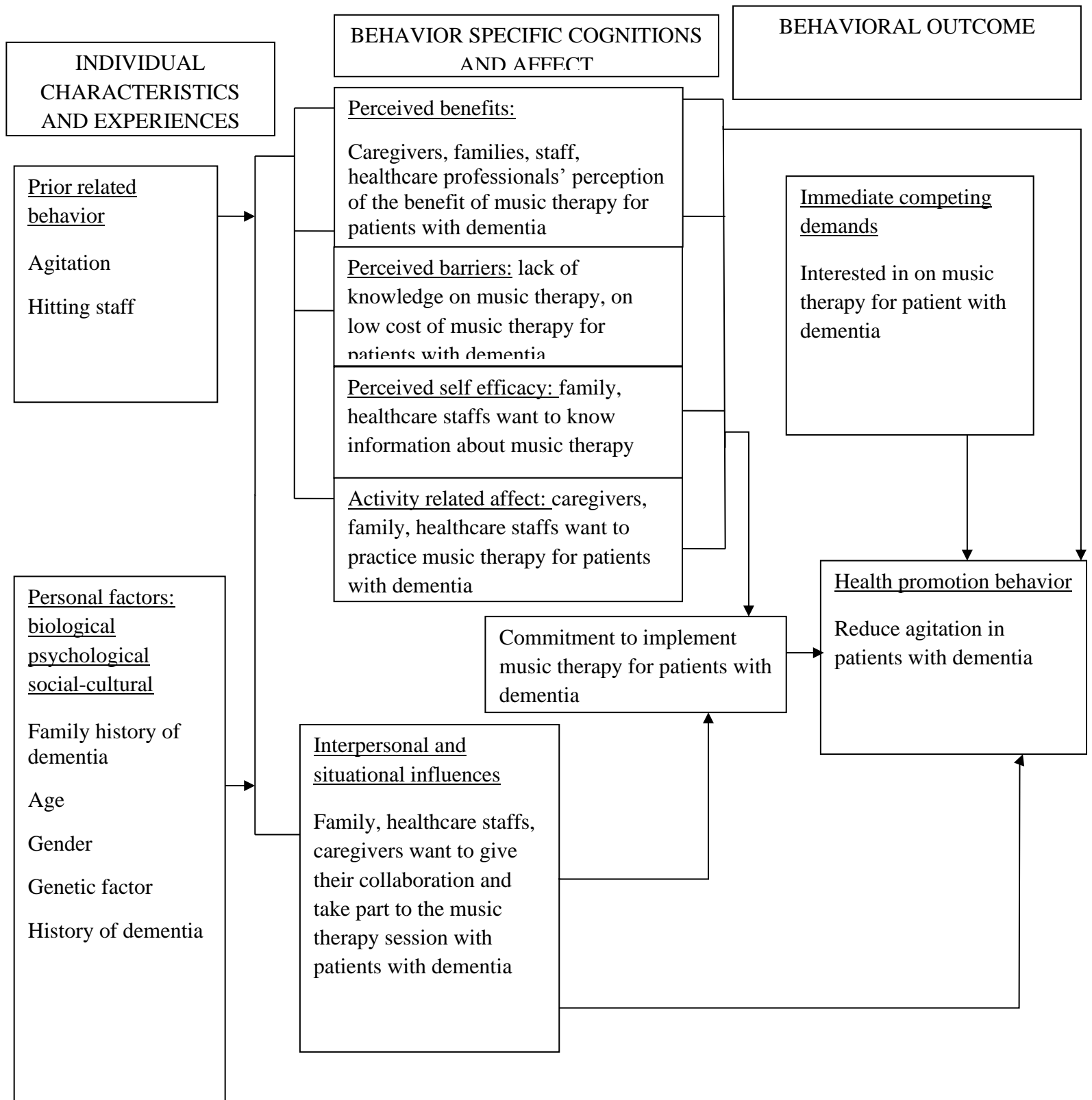
Appendix A
SWOT Analysis

Internal to the Long-Term care	Strengths: <ul style="list-style-type: none">• Reduce behavioral symptoms, improve quality of life for patients with dementia• Decrease caregivers Workload and patient distress by reducing the rate of behavioral symptoms• Reduce the rate of agitation in patients can reduce the rate of fall, injuries, and possibly death• Reduce the rate of agitation can reduce the rate of using psychotropic medications	Weakness: <ul style="list-style-type: none">• Resistance to practice change• Lack of knowledge on music therapy• Lack of knowledge on low cost of music therapy for patients with dementia
External to the Environment	Opportunities: <ul style="list-style-type: none">• Available for public health awareness• Support community long term care• Improve the quality of life of patients with dementia in long term care• Lower healthcare cost on psychotropic medication and fall, injuries when patients with dementia have reduced aggressive behaviors	Threats: <ul style="list-style-type: none">• Lack of time• Lack of motivation



Appendix B

Pender's Health Promotion Model





Appendix C Permission Letter

[REDACTED]

Date: 08/27/2019

Re: Letter of Cooperation for [REDACTED]

Dear Roody Dalberis,

This letter confirms that I, Veronica Onwunaka administrator at [REDACTED] [REDACTED] have reviewed your request to conduct a study that involves the [REDACTED] [REDACTED] This project consists of the implementation of music therapy to reduce the rate of aggressive behaviors among demented residents.

Sixteen residents who have a diagnosis of dementia will be selected. These residents will attend twelve sessions of music therapy that will be performed twice a week. Cohen Mansfield Agitation inventory will be used during pre and posttests to evaluate the effectiveness of music therapy on agitation reduction. The site will provide available support including space to conduct the study activity. All selected residents information will be strictly confidential only the principal investigator who is Mr. Roody Dalberis will know the resident's information. Each selected resident will be assigned with a number for data collection, and data collection will be secured with a password on electronic device. All research activities expect to stop at the end of November 2019.

I feel this project will be beneficial to the [REDACTED]
You have the [REDACTED] to execute this project at its local.

If you have any questions regarding this letter of approval, please give me a call at [REDACTED]

[REDACTED]

Our mission is to help residents of inner cities improve the quality of their lives
to reflect individual God-given dignity and personal achievement.

VE2.08.27.2019

AH



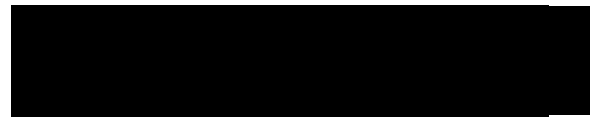
Appendix D
RUTGERS
School of Nursing

Invitation to Participate in a Research Study



- The purpose of the research study is to implement the utilization of music therapy in the management of disruptive behaviors in patients with dementia.
- Listening to music and joining in music therapy may help the person feel more calm and positive in mood.
- Your time in the study will take 30 minutes of music therapy twice a week for a period of six weeks.
- The session will be active music therapy wherein the participants will have the opportunity to listen to their favorite songs while singing, and clapping their hands.
- Gerti E. Heider is the Principal Investigator of this research study. A Principal Investigator has the overall responsibility for the conduct of the research.

The music therapy intervention session will take place in the recreational room.





RUTGERS
School of Nursing
Discussion Meetings



Qualified Participants Must:

- Adults English speaking male and female
- Diagnosis of dementia with no psychiatric disorders
- No hear auditory problems
- Ability to walk

Two discussion meetings:

- January 17th & 18th @ 3 P.M
- Location: Long Term Care Unit/Recreational Room

Discussion will be on:

- Music therapy and Dementia
- Music therapy can decrease agitation on Dementia

Call Today:

██████████ for more
info

Enrollment after the last discussion
meeting will last one week

Location: Recreational room from
Monday –through Tuesday from 9 A.M to
2 P.M



RECRUITMENT SCRIPT

My name is Gerti E. Heider, a faculty member from the Department of School of Nursing at Rutgers University. I would like to invite you to participate in my research study to implement the utilization of music therapy in the management of disruptive behaviors in patients with dementia.

You may participate if you are adults, English speaking men and women who have a diagnosis of dementia with no concurrent psychiatric disorders such as schizophrenia or depression. Participants must be able to hear properly with no auditory problems in order to experience music therapy. Participants must also be free from medical conditions such as stroke or the inability to walk that can prevent them from taking part in the music therapy session. Please do not participate if you are adult's men and women with dementia who also have medical conditions such as stroke, an inability to walk, and auditory problems as well as patients with dementia who do not have approval from family members or legal representatives. Moreover, patients with dementia who have concurrent psychiatric disorders such as schizophrenia and depression do not need to take part in the study.

As a participant, you will be asked to listen to 30 minutes of music therapy twice a week for a period of six weeks. Possible harms or burdens of taking part in the study may be due to the long period of 30 minutes to listen to music and possible benefits of taking part may be decreased agitation.

Do you have any questions? If you have questions later, please contact me at [REDACTED] or

[REDACTED]



Appendix E
Inform Consent
RUTGERS
School of Nursing

(SURROGATE) CONSENT TO TAKE PART A RESEARCH STUDY

TITLE OF STUDY: Music Therapy for the Treatment of Agitation in Patients with Dementia

Principal Investigator: Gerti E. Heider, PhD, MSN, GNP-BC, ANP

SECTION I. SUBJECT CONSENT

A person who takes part in a research study is called a research or study subject. In this section, “you” always refers to the individual who will be the research subject.

STUDY SUMMARY: This consent form is part of an informed consent process for a research study and it will provide information that will help you decide whether you want to take part in this study. It is your choice to take part or not. **The purpose of the research** is to implement the utilization of music therapy in the management of disruptive behaviors in patients with dementia. If you take part in the research, you will be asked to participate in a session of music therapy. Listening to music and joining in music therapy may help the person feel calmer and more positive in mood. **Your time in the study will take** 30 minutes of music therapy twice a week for a period of six weeks. **Possible harms or burdens** of taking part in the study may be due to the long period of 30 minutes to listen to music and possible benefits of taking part may be decreased agitation. Your alternative to taking part in the research study is not to take part in it.

The information in this consent form will provide more details about the research study and what will be asked of you if you choose to take part in it. If you have any questions now or during the study, if you choose to take part, you should feel free to ask them and should expect to be given answers you completely understand. After all of your questions have been answered and you wish to take part in the research study, you will be asked to sign this consent form. You are not giving up any of your legal rights by agreeing to take part in this research or by signing this consent form.

Who is conducting this research study?



Gerti E. Heider is the Principal Investigator of this research study. A Principal Investigator has the overall responsibility for the conduct of the research. However, there are often other individuals who are part of the research team.

Gerti E. Heider, PhD may be reached at [REDACTED]
[REDACTED]

The Principal investigator or another member of the study team will also be asked to sign this informed consent. You will be given a copy of the signed consent form to keep.

Why is this study being done?

This study is being done to manage and control agitation in patients with dementia.

Who may take part in this study and who may not?

The criteria for taking part in this study include adults English speaking men and women diagnosed with dementia with no other existing mental illness. Participants must be able to hear properly with no auditory problems in order to experience music therapy. Participants must be free from illness conditions such as the inability to walk that can prevent them from taking part in the music therapy session. However, participants not only who have illness conditions such as the inability to walk, to hear but also participants who do not have approval from family members or legal guardian will be excluded from the study. Moreover, participants who have other mental illness such as schizophrenia and depression will not take part in the study.

Why have I been asked to take part in this study?

You have been asked to take part in this study because your participation helps researchers to show that music therapy can effectively decrease agitation in patients with dementia. This could lead to the use of music therapy for other patients with dementia who are in need.

How long will the study take and how many subjects will take part?

Sixteen participants will take part in this study for this site. The duration of the music therapy intervention will be thirty-minutes twice a week for a period of six weeks.

What will I be asked to do if I take part in this study?

The only thing you will be asked to do is to join and listen to music.

What are the risks and/or discomforts I might experience if I take part in this study?



You might experience some discomforts for sitting thirty minutes to listen to music therapy intervention. However, if you want you can stand up, dancing, or clapping your hands.

Are there any benefits to me if I choose to take part in this study?

However, it is possible that you may not receive any direct benefit from taking part in this study.

What are my alternatives if I do not want to take part in this study?

There are no alternative treatments available. Your alternative is not to take part in this study.

How will I know if new information is learned that may affect whether I am willing to stay in the study?

During the study, you will be updated about any new information that may affect whether you are willing to continue taking part in the study. If new information is learned that may affect you after the study or your follow-up is completed, you will be contacted.

Will there be any cost to me to take part in this study?

There will be no cost if you take part in this study

Will I be paid to take part in this study?

You will not be paid to take part in this study.

How will information about me be kept private or confidential?

All efforts will be made to keep your personal information in your research record confidential, but total confidentiality cannot be guaranteed.

Data collection for evaluation of the project for each participant will be coded with a number. The principal investigator only will know the information of the participants and the coded number that will attribute to the participants. All data collection will be securitizing with a password on the electronic device that the principal investigator will use to collect and analyze data. The electronic device will be used only for this project with no internet access in order to prevent hacking

What will happen if I do not wish to take part in the study or if I later decide not to stay in the study?

It is your choice whether to take part in the research. You may choose to take part, not to take part or you may change your mind and withdraw from the study at any time.



If you do not want to enter the study or decide to stop taking part, your relationship with the study staff will not change, and you may do so without penalty and without loss of benefits to which you are otherwise entitled.

You may also withdraw your consent for the use of data already collected about you; the DNP student will inform the principal investigator on your decision to withdraw from the study.

If you decide to withdraw from the study for any reason, you may be asked to return for at least one additional visit for safety reasons.

Who can I call if I have questions?

If you have questions about taking part in this study or if you feel you may have suffered a research related injury, you can contact: Gerti E. Heider, PhD may be reached at [REDACTED]

If you have questions about your rights as a research subject, you can contact the Rutgers IRB Director at: Newark HealthSci IRB, 65 Bergen St., SSB 511, Newark, NJ 07107, (973)-972-3608 or the Rutgers Human Subjects Protection Program at (973) 972-1149, email us at humansubjects@ored.rutgers.edu or write us at 65 Bergen St., Suite 507, Newark, NJ 07107.

PERMISSION (Authorization) TO USE OR SHARE HEALTH INFORMATION THAT IDENTIFIES YOU FOR A RESEARCH STUDY

The next few paragraphs tell you about how investigators want to use and share identifiable health information from your medical record in this research. Your information will only be used as described here or as allowed or required by law. If you sign this consent form, you agree to let the investigators use your identifiable health information in the research and share it with others as described below. Ask questions if there is something you do not understand.

What is the purpose of the research and how will my information be used?

You are being invited to take part in this research study which is described at the beginning of this form. The purpose of collecting and using your health information for this study is to help investigators answer the questions that are being asked in the research.



What information about me will be used?

- Age
- Diagnosis
- Sex
- Ethnicity

Who May Use, Share Or Receive My Information?

The research team may use or share your information collected or created for this study with the following people and institutions:

- Rutgers University Investigators Involved in The Study
- The Rutgers University Institutional Review Board and Compliance Boards
- The Office for Human Research Protections in the U.S. Dept. of Health and Human Services

Those persons or organizations that receive the research subject's information may not be required by Federal privacy laws to protect it and may share your information with others without your permission, if permitted by the laws governing them.

Will I be able to review my research record while the research is ongoing?

No. We are not able to share information in the research records with you until the study is over. To ask for this information, please contact the Principal Investigator, the person in charge of this research study.

Do I have to give my permission?

No. You do not have to permit use of your information. But, if you do not give permission, you cannot take part in this study. (Saying no does not stop you from getting medical care or other benefits you are eligible for outside of this study.)

If I say yes now, can I change my mind and take away my permission later?

Yes. You may change your mind and not allow the continued use of your information (and to stop taking part in the study) at any time. If you take away permission, your information will no longer be used or shared in the study, but we will not be able to take back information that has



already been used or shared with others. If you say yes now but change your mind later for use of your information in the research, the DNP student will inform the principal investigator on your decision to withdraw from the study.

How long will my permission last?

Your permission for the use and sharing of your health information will last until the end of November 2019 followed by the destruction all of participant information on the electronic device in accordance with Rutgers University guidelines

AGREEMENT TO PARTICIPATE

Subject Consent

I have read this entire consent form, or it has been read to me, and I believe that I understand what has been discussed. All of my questions about this form and this study have been answered. I agree to take part in this study.

Subject Name (Print): _____

Subject Signature: _____
_____ Date: _____

2. Signature of Investigator/Individual Obtaining Consent:

To the best of my ability, I have explained and discussed all the important details about the study including all of the information contained in this consent form.

Investigator/Person Obtaining Consent Name (Print): _____

Signature: _____
_____ Date: _____

II. SURROGATE CONSENT

Under certain circumstances, an individual can give consent for another person to take part as a Subject in this Research Study (hereinafter “Study”) because the Subject is unable to consent to



this Study and the Subject has not expressed opposition either to this Study or to the determination of incapacity. This individual is called the Legally Authorized Representative, or Surrogate, and is providing Surrogate consent.

You are being asked to serve as the Surrogate for _____, who is called the Subject in this document. You are being asked to give permission for the Subject to participate in this Study. Your decision should be based on the Subject's individual health care instructions and other wishes, if known, or on your best estimation of what you believe are the Subject's personal values and what the Subject would choose for himself/herself.

Would the person for whom you are signing consent want to take part in this Study?

This form tells you about this Study. After reading this entire form and having this Study explained to you by someone conducting this Study, you can decide if you think the person for whom you are authorizing consent would want to take part in this Study. It is important to note that the person for whom you are signing consent does not have to take part in this Study in order to receive medical care outside this Study.

What will happen if you, as the Surrogate, do not enroll the Subject in this Study, or if the Subject, or you as the Surrogate, later does not want the Subject to participate in this Study?

The Surrogate can decide not to enroll the Subject. The Subject or the Surrogate can decide to discontinue at any time, the Subject's participation in this Study. Any decision by the Surrogate not to enroll the Subject or by the Subject or the Surrogate to discontinue the Subject's participation shall not affect the Subject including the Subject's receipt of medical care outside the Study. The Subject may withdraw without penalty and without loss of any benefits to which s/he are entitled.

Regardless of the Surrogate's consent, the Investigator can take the Subject out of this Study at any time because it would not be in the Subject's best interest to stay in it.



AGREEMENT TO PARTICIPATE

Surrogate Consent

The purpose and procedures for this Study have been described to me verbally and in writing. My questions about this Study have been answered and I have been provided with information about who to contact with additional questions.

As Surrogate, I freely give my consent to allow _____ (printed name of subject) to take part in this Study and authorize that his/her health information as described above, be collected/disclosed in this Study. I understand that by signing this form I am agreeing for the individual named above to take part in research. I understand that I will receive a copy of this form to take with me.

Name of Surrogate (Print): _____

Signature: _____

Date: _____

Signature of Investigator/Individual Obtaining Consent

To the best of my ability, I have explained and discussed the full contents of the study including all of the information contained in this consent form. All questions of the research subject and those of his/her parent or legally authorized representative have been accurately answered.

Investigator/Person Name (Print): _____

Signature: _____

Date: _____

Signature of Consent Process Witness

I have observed the consent process which included a description of the purposes and procedures of this Study and an opportunity for questions and answers about this Study. I attest that I am not the subject, his/her guardian or authorized representative, or a researcher on this study and can attest that the requirements for informed consent to the medical research have been satisfied.

Name of Witness (Print): _____

Signature: _____ Date: _____

III. CONSENT TO TAKE PART IN A RESEARCH STUDY FOR INDIVIDUALS ENROLLED UNDER PRIOR SURROGATE CONSENT



Under certain circumstances, someone can give consent for another person to take part in a research study. This person is providing “surrogate consent.” The surrogate can make choices for the subject, if the subject is not able to make choices for him or herself. In fact, since -----, you have been enrolled in this research study by your surrogate,----- . If you wish to continue to take part in the research, please consent by signing the agreement to participate.

AGREEMENT TO CONTINUE PARTICIPATION

Subject Consent

I have read this entire consent form, or it has been read to me, and I believe that I understand what has been discussed. All of my questions about this form and this study have been answered. I agree to continue to take part in this study.

Subject Name (Print): _____

Subject Signature: _____ Date: _____

2. Signature of Investigator/Individual Obtaining Consent:

To the best of my ability, I have explained and discussed all the important details about the study including all of the information contained in this consent form.

Investigator/Person Obtaining Consent Name (Printed): _____

Signature: _____ Date: _____



Appendix F
Inform Consent

ASSENT TO TAKE PART IN A RESEARCH STUDY

TITLE OF STUDY: MUSIC THERAPY AND DEMENTIA

Principal Investigator: Gerti E. Heider, PhD, MSN, GNP-BC, ANP

Who are you and why are you meeting with me?

I am **Gerti E. Heider** and I work at Rutgers, The State University of New Jersey, School of Nursing in the Department of Nursing I would like to tell you about a research study that involves people like yourself and see if you would like to take part in it. Please ask me, other study staff, to explain any words you don't understand about the study.

What is this research study about?

Music therapy in patients with dementia is one such form of intervention. Moreover, music therapy is extensively used for patients whose medication interventions are not always effective and may lead to numerous side effects. Many researchers have found that music therapy appeared to be the most effective intervention for use in long term care settings in patients with dementia

Why have I been asked to take part in this study?

You have been asked to take part in this study because your participation helps researchers to show that music therapy can effectively decrease agitation in patients with dementia. This could lead to the use of music therapy for other patients with dementia who are in need.

Who can be in this study? And who may not? How long will the study take?

The criteria for taking part in this study include adults English speaking men and women diagnosed with dementia with no other existing mental illness. Participants must be able to hear properly with no auditory problems in order to experience music therapy. Participants must be free from illness conditions such as the inability to walk that can prevent them from taking part in the music therapy session. However, participants not only who have illness conditions such as the inability to walk, to hear but also participants who do not have approval from family members or legal guardian will be excluded from the study. Moreover, participants who have other mental illness such as schizophrenia and depression will not take part in the study. The duration of the music therapy intervention will be thirty-minutes twice a week for a period of six weeks.

What will happen to me if I take part in this study?



The only thing you will be asked to do is to join and listen to music.

Can something bad happen to me or will I feel uncomfortable if I take part in this study?

Sometimes things happen to people in research studies that may hurt them or make them feel bad. These are called risks. The risks of this study are some discomforts for sitting thirty minutes to listen to music therapy intervention. However, if you want you can stand up, clapping your hands.

Can something good happen to me if I take part in the study?

However, it is possible that you may not receive any direct benefit from taking part in this study.

Will others know what I say and do in the study?

All efforts will be made to keep your personal information in your research record confidential, but total confidentiality cannot be guaranteed.

Data collection for evaluation of the project for each participant will be coded with a number. The principal investigator only will know the information of the participants and the coded number that will attribute to the participants. All data collection will be securitizing with a password on the electronic device that the principal investigator will use to collect and analyze data. The electronic device will be used only for this project with no internet access in order to prevent hacking.

Will I be given anything to take part in this study?

You will not be paid to take part in this study.

What if I do not want to take part in this study?

You don't have to take part in this study if you don't want to. No one will get angry or upset if you do not want to be in the study. Just tell us. And remember, you can change your mind later if you decide you don't want to be in the study anymore.

What if I have questions?

You can ask questions at any time. You can ask now. You can ask later. You can talk to me or you can talk to someone else at any time during the study. Here are the telephone numbers to reach us: If you have questions about the study you can call the study doctor at: [REDACTED]

If you have questions about your rights as a research subject, you can contact the IRB Director at: Newark HealthSci IRB (973)-972-3608 or the Rutgers Human Subjects Protection Program at (973) 972-1149 or email us at humansubjects@ored.rutgers.edu.

What are my rights if I decide to take part in this research study?



You may ask questions about any part of the study at any time. Do not sign this form unless you have had a chance to ask questions and have been given answers to all of your questions and agree to take part in the study.

If you say yes, your parent(s) or guardian will also be asked if they permit you to take part in this study. You will be given a copy of this form to keep.

AGREEMENT TO PARTICIPATE

Signature of Subject:

I have read this entire form, or it has been read to me, and I believe that I understand what has been talked about. All my questions about this form and this study have been answered.

I agree to take part in this research study.

Subject Name (Print): _____

Subject Signature: _____ Date: _____

Signature of Investigator or Responsible Individual:

To the best of my ability, I have explained and discussed the important details about the study including all information contained in this assent document. All questions of the research subjects and those of his/her parent(s) or legal guardian have been accurately answered.

Investigator/Person Obtaining Consent Name (Print): _____

Signature: _____ Date: _____



INTERNAL SURROGATE CONSENT PROCESS FORM

PI: Gerti E. Heider, PhD, MSN, GNP-BC, ANP

Sponsor:

Protocol #: Pro2019001463

Subjects Name: _____

Principal Investigator/Sub-Investigator

Does the subject have an advance directive for healthcare that has indicated that he/she does not wish to participate in a research study?

- ☐ *No* ☐ ***Yes, the potential subject must not be included in the study.***

Did the investigator attempt to obtain informed consent directly from the subject?

- ☐ *Yes* ☐ *Unable to consent, request a determination of capacity to consent*
- ☐ ***Subject objects to proposed research, the potential subject must not be included in the study***

Signature of Investigator

Date



Independent Physician

Section 1: Determination of Incapacity

- ☐ *Interviewed subject and a representative with reasonable knowledge of the subject*

What is the extent of the incapacity?

What is the likelihood that he/she will regain decision-making capacity?

Additional Comments:

- ☐ *Subject is unable to consent*

I have no connection with the above referenced study and have determined, to a reasonable degree of medical certainty, that the above named subject is unable to voluntarily reason, understand, and appreciate the nature and consequence of proposed health research interventions, including the subject's diagnosis and prognosis, the burdens, benefits, and risks of, and alternatives to, any such research, and to reach an informed decision.



Signature

Date

Principal Investigator/Sub-Investigator

Section 2: Identification of Surrogate

Did the investigator inform the subject about the study and of his/her intention to seek a surrogate to provide consent?

☐ *Yes* ☐ *No*

Did the subject express resistance or dissent to participation or to the use of a surrogate for consent?

☐ *No* ☐ *Yes – the investigator must exclude the subject from the study.*

Surrogate informed consent may be obtained from an authorized representative with reasonable knowledge of the subject; refer to the attached Surrogate Self Certification form.

Surrogate Name _____

Relationship #: _____

(from Surrogate Certification form)



1. *The investigator must make a good faith effort to contact the individual at the highest level of priority. These efforts should be documented. Potential surrogates must be advised that if a higher-ranking surrogate is identified at any time, the investigator whenever feasible will defer to the higher-ranking surrogates' decision regarding the subject's participation in the research.*
2. *The investigator must assure that if one of two or more available persons in the same order or priority expresses opposition to the participation of the subject in the study, the investigator must exclude the subject from the study.*
3. *The investigator must assure that when two or more available persons are in different orders of priority, refusal to consent by a potential surrogate who is of a higher priority controls and cannot be superseded by the consent of a person who is of a lower priority.*

I have reviewed the above information and have determined that the criteria for identification of a surrogate have been met.

Signature

Date

Witness (person with no connection to the study)

Date



SURROGATE SELF-CERTIFICATION

Surrogate Decision Makers for Participation in Research

SECTION ONE:

I am willing to serve as a surrogate decision maker for _____

(research participant)

to participate in the research study titled conducted by the principal investigator, Gerti E. Heider, PhD, MSN, GNP-BC, ANP. By initialing and signing below I attest that, to the best of my knowledge, the information I am providing is true and accurate.

SECTION TWO: CATEGORY of POTENTIAL SURROGATE

- a) Place your initials next to the category that best describes your relationship to the Subject.**
- b) For the categories ABOVE yours, provide the name(s) of other relative(s).**
(For example, if you are the adult son/daughter of the Subject, provide the name(s) of adults, if any, in categories 1 through 4 only).



Category		Name(s) of Individual(s) and Contact Information	
1.	_____	the guardian of the Subject who has authority to make health care decisions for the subject	
2.	_____	the healthcare representative of the Subject pursuant to an advance directive for healthcare	
3.	_____	the spouse or civil union partner of the Subject (identified by a civil union license or certificate)	
4.	_____	the domestic partner of the potential research Subject (identified by a Certificate of Domestic Partnership)	
5.	_____	an adult son or daughter of the potential Subject	
6.	_____	a custodial parent of the Subject	
7.	_____	an adult brother or sister of the Subject	
8.		an adult grandchild of the Subject	



Appendix G

THE COHEN-MANSFIELD AGITATION INVENTORY - short form

Please read each of the agitated behaviors, and check how often (from 1-5) they were manifested by the participant over the last 2 weeks; if more than one occurred within a group, add the occurrences, e.g., if hitting occurred on 3 days a week, and kicking occurred on 4 days a week, 3 + 4 = 7 days; circle 4, once or several times a day.

	Never 1	Less than once a week 2	Once or several times a week 3	Once or several times a day 4	A few times an hour or continuous for half an hour or more 5
1. Cursing or verbal aggression					
2. Hitting (including self), Kicking, Pushing, Biting, Scratching, Aggressive Spitting (include at meals)					
3. Grabbing onto people, Throwing things, Tearing things or destroying property					
4. Other aggressive behaviors or self abuse including: Intentional falling, Making verbal or physical sexual advances, Eating/drinking/ chewing inappropriate substances, Hurt self or other					
5. Pace, aimless wandering, Trying to get to a different place (e.g., out of the room, building)					
6. General restlessness, Performing repetitious mannerisms, tapping, strange movements					
7. Inappropriate dress or disrobing					
8. Handling things inappropriately					



9. Constant request for attention or help					
10. Repetitive sentences, calls, questions or words					
11. Complaining, Negativism, Refusal to follow directions					
12. Strange noises, (weird laughter or crying)					
13. Hiding things, Hoarding Things					
14. Screaming					

Cohen-Mansfield, 1986. All rights reserved.



Appendix H
Permission Utilization of CMAI

From: [REDACTED]
Sent: Monday, March 25, 2019 3:09 AM
To: Roody Dalberis
Subject: RE: request to use Cohen-Mansfield Agitation Inventory

Dear Roody Dalberis,

You have my permission to use the CMAI for the academic research you mention as long as 1) you consult the manual in order to use it correctly, 2) you keep my copyright sign (c) Cohen-Mansfield on all forms, 3) you do not sell the questionnaires or their derivatives to anyone, 4) you provide proper attribution for the assessment, 5) If you prepare materials for the use of the assessment (e.g., training materials, modification of the assessment, or software for using it) , you will send me a copy with a permission to use , 6) If you translate the CMAI, you will send me a copy of the translation, with an explanation of the method of translation and permission to use, and 7) if you or anyone you are associated with wants to use the questionnaire for other purposes, you will request separate permission from [REDACTED] . at [REDACTED]

Attached please find the manual with the assessment as well as a list of publications by topic.

I wish you success with your work,

[REDACTED]

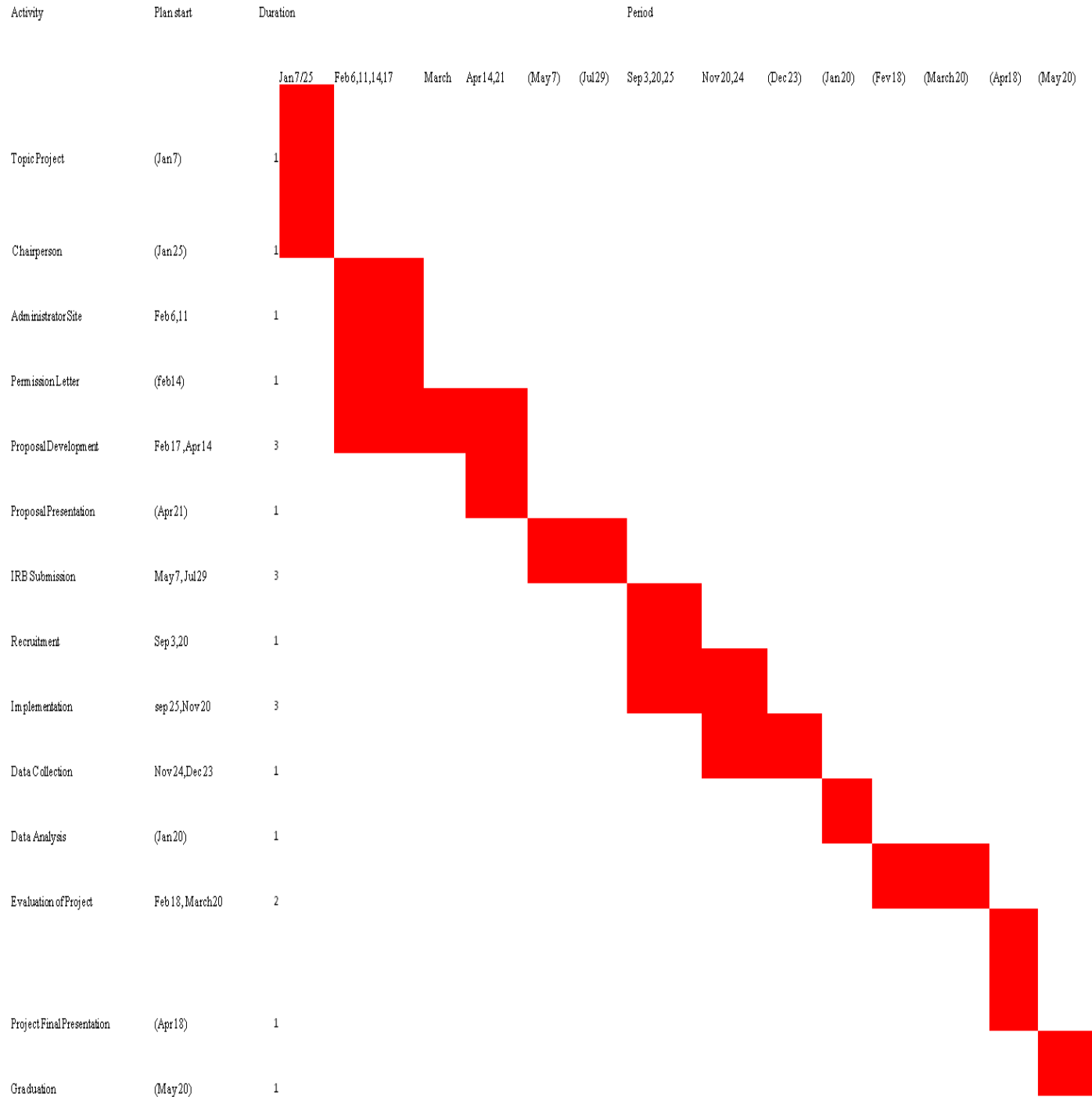
From: Roody Dalberis <[REDACTED]>
Sent: Monday, 25 March 2019 8:10
To: [REDACTED]
Subject: request to use Cohen-Mansfield Agitation Inventory

I am Roody a graduate student from [REDACTED] where I got my BNS. I am in the DNP program right now, and I am doing my project on music therapy and dementia. I would like to get you permission to use the Cohen-Mansfield Agitation Inventory test for my project. I am looking forward to hearing from you.
Thank you so much for your attention



Appendix I

Timeline





Appendix J
Project Budget

Expenses	Cost	Total Cost
MP3 player	\$140	\$140
Speaker	2 @ \$99	\$198
Recruitment Flyers	9 @ \$14.99	\$134.91
Binding of Final Project	4 @ \$60	\$240
Statistician Consultant	2hrs @ \$80	\$160
IBM SPSS software	\$100	\$100
Refreshments	\$60 X 8 sessions	\$480
Total Budget		\$1452.91

Appendix K

Data Collection Form

All data collection was secured with a password on the electronic device that the DNP student was use to collect and analyze data. The electronic device was used only for this project with no internet access in order to prevent hacking

[illegible]



Appendix L

Chart 1

Depict the gender of the participants

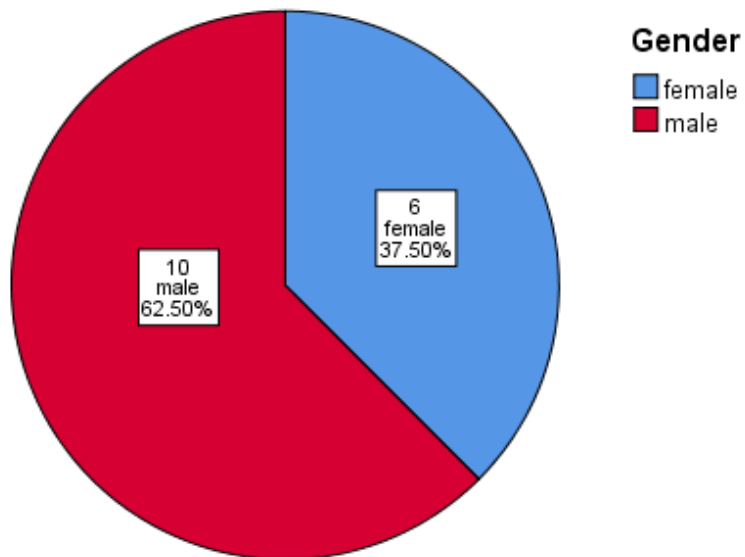


Chart 2

Depict the ethnicity of the participants

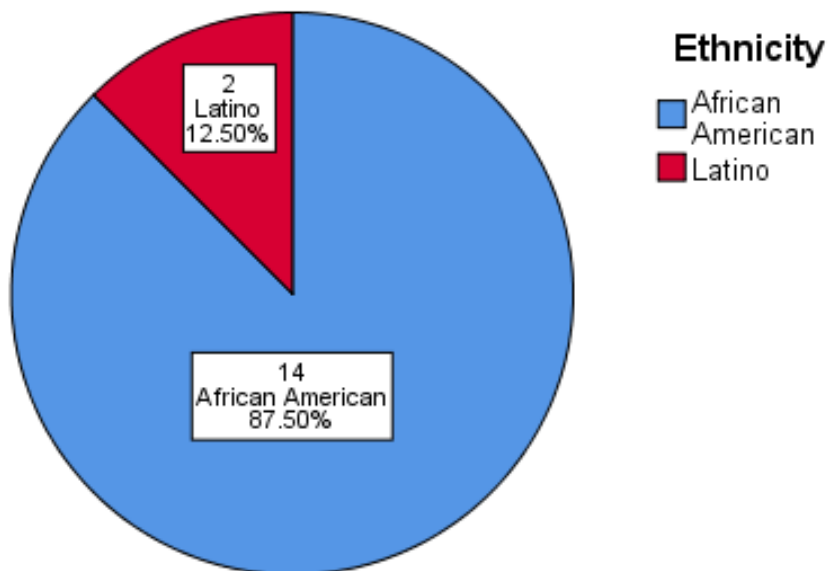
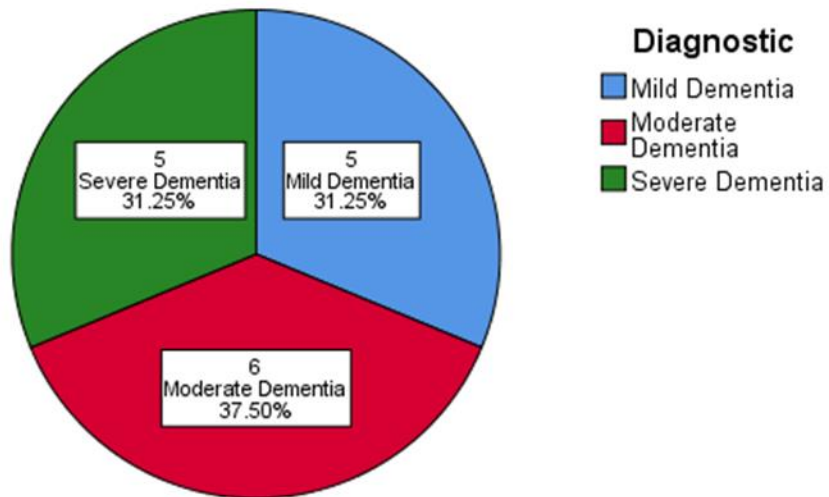


Chart 3**Depict the diagnosis of the participants****Figure 4****Descriptive Statistics**

	Mean	Std. Deviation	N
PRETEST	61.12	2.094	16
DURING TEST1	54.19	1.974	16
DURING TEST2	49.88	1.708	16
POSTTEST	42.88	1.893	16



Figure 5

Profile Plots

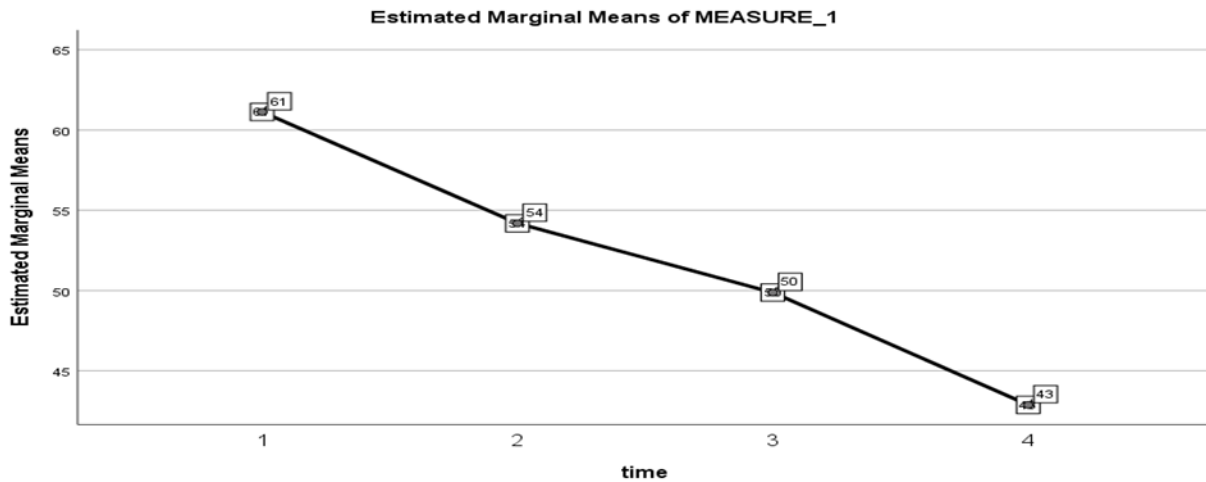


Figure 6

Multivariate Tests ^a									
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^c
time	Pillai's Trace	.975	169.598 ^b	3.000	13.000	.000	.975	508.794	1.000
	Wilks' Lambda	.025	169.598 ^b	3.000	13.000	.000	.975	508.794	1.000
	Hotelling's Trace	39.138	169.598 ^b	3.000	13.000	.000	.975	508.794	1.000
	Roy's Largest Root	39.138	169.598 ^b	3.000	13.000	.000	.975	508.794	1.000
	Root								

a. Design: Intercept

Within Subjects Design: time

b. Exact statistic

c. Computed using alpha = .05



Figure 7

Pairwise Comparisons

Measure: MEASURE_1

(I) time	(J) time	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
					Lower Bound	Upper Bound
1	2	6.938*	.674	.000	4.892	8.983
	3	11.250*	.772	.000	8.906	13.594
	4	18.250*	.777	.000	15.890	20.610
2	1	-6.937*	.674	.000	-8.983	-4.892
	3	4.313*	.506	.000	2.776	5.849
	4	11.313*	.637	.000	9.378	13.247
3	1	-11.250*	.772	.000	-13.594	-8.906
	2	-4.312*	.506	.000	-5.849	-2.776
	4	7.000*	.632	.000	5.080	8.920
4	1	-18.250*	.777	.000	-20.610	-15.890
	2	-11.312*	.637	.000	-13.247	-9.378
	3	-7.000*	.632	.000	-8.920	-5.080

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.



Evidence of Table

Article #	Author & Date	Evidence Type	Sample, Sample Size, Setting	Study findings that help answer the EBP Question	Limitations	Evidence Level & Quality
1) Music therapy for service users with dementia	Blackburn, R., & Bradshaw, T. (2014).	Systemic review of randomized controlled trial	Six studies and sample size between 28 and 111 All studies were done in a long term care with adults over age 65 with a diagnosis of dementia	Findings help pinpoint music therapy has potential benefit for use in patients with dementia.	further research would be recommend to evaluate the effectiveness of music therapy because of small size sample of some studies	Level 1 & High quality
2) The efficacy of music therapy for people with dementia	Chang, Y., Chu, H., Yang, C., Tsai, J., Chung, M., Liao, Y., ... Chou, K. (2015).	A meta-analysis of randomized controlled trials	Ten studies included. Studies were done in a long term care with older adults formally diagnosed with any types of dementia	The findings of this meta-analysis inferred that music therapy is beneficial for patients with dementia	The variations among outcome measurement scales included in the meta-analysis	Level 1 & High quality



3) Music therapy to reduce agitation in dementia	Craig, J. (2014).	Systemic review	Eight articles from	Music therapy can be used for patients with all stages of dementia	Limited to type of music need to be played	Level I & High quality
4) Effects of Music Therapy on Agitation in Dementia: Systematic Review and Meta-analysis	Eun-Hi Kong, & Myonghwa Park. (2015).	A meta-analysis of randomized controlled trials	Ten studies were included. All studies were conducted in a long term care	Study findings concluded that music therapy can be effective for reduction of agitation in dementia	Further study needs to evaluate the effectiveness of music therapy according to the severity of agitation and dementia	Level I & High quality
5) Dementia and the Power of Music Therapy	Matthews, S. (2015).	Case report	Case report	Music therapy can connect caregiver and patients with dementia in more social activity	Limited to lack of deep assessment of multiple cases and comparison of case	Level V & good quality
6) The importance of music for people with dementia: the perspectives of people with dementia,	McDermott, O., Orrell, M., & Ridder, H. M. (2014).	Qualitative/focus group and interviews	Sixty nine patients with dementia in two different long term care	The effects of music go beyond the reduction of behavioral and psychological symptoms	Family and residents knew the researcher as clinician. This would affect how participants would have responded during	Level III & good quality



family carers, staff and music therapists					the focus and interviews	
7) Efficacy of musical interventions in dementia	Narme, P., Clément, S., Ehrlé, N., Schiaratura, L., Vachez, S., Courtaigne, B., ... Samson, S. (2014).	randomized controlled trials	Forty-eight patients with Alzheimer's disease or mixed dementia in long term care	Findings concluded that music therapy can improve emotional and behavioral symptoms in patients with dementia and reduce care givers distress	Further studies need to investigate the dose effect and individual preferences	Level 1 & High quality
8) Individual music therapy for agitation in dementia	Ridder, H. M. O., Stige, B., Qvale, L. G., & Gold, C. (2013).	Experimental randomized controlled trial	forty-two participants with dementia in a long term care	Agitation disruptive decreased and recommends music therapy as a valid treatment and possibility to reduce psychotropic medication and caregiver burn out.	Interviewers and proxy respondents were not blinded to the treatment and missing data in the demographic collection	Level 1 & High quality
9) Comparing the effects of different	Sakamoto, M., Ando, H., &	randomized controlled trial	Thirty nine patients with severe dementia	Music intervention can reduce	Limited test on the length of interventions to	Level 1 & High quality



individualized music interventions for elderly individuals with severe dementia	Tsutou, A. (2013).		type Alzheimer in long term care	stress in patients with severe dementia	reach the maximum therapeutic response	
10) Effects of group music therapy on quality of life, affect, and participation in people with varying levels of dementia	Sole, C., Mercadal-Brotons, M. M., Galati, A., & De Castro, M. (2014).	Exploratory study	Sixteen patients with varying level of dementia in long term care	Findings suggest to take into consideration in the practice of music therapy with patients with dementia	Small sample size and limited methodology for recruitment	Level V & good quality
11) Musical intervention for patients with dementia	Vasionytė, I., & Madison, G. (2013).	Meta-analysis	Nineteen studies/all studies were done in long term care	Music therapy seems to be effective and has the possibility to increase the quality of life for patients with dementia	Poor methodology quality which limits the goal of meta-analysis study	Level II & good quality
12)Effect of Music Therapy Versus Recreational	Vink, A. C., Zuidersma, M., Boersma, F., Jonge, P.,	Exploratory Randomized controlled trial	Ninety four patients with dementia in long term care	Findings show reductions in neuropsychiat	Modified CMAI was used to assess agitation in patients with dementia which lacks the	Level 1 & High quality



Activities on Neuropsychiatric Symptoms in Elderly Adults with Dementia	Zuidema, S. U., & Slaets, J. P. (2014).			ric symptoms when patients with dementia receives music therapy	sensitivity of the full version	
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