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Los Angeles

An Application of Music Therapy for Nursing Home Residents with Dementia

A dissertation submitted in partial satisfaction of the
requirements for the degree
Doctor of Nursing Practice

by

Karima Gulwani

2022

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ABSTRACT OF THE DISSERTATION

An Application of Music Therapy for Nursing Home Residents with Dementia

by

Karima Gulwani

Doctor of Nursing Practice

University of California, Los Angeles

Professor Barbara Bates-Jensen, Chair

Purpose: To examine the use of music therapy in nursing home (NH) residents living with dementia with agitation and aggressive behaviors and receiving as needed psychotropic medications.

Background: Agitation and aggressive behaviors associated with dementia occur in 15 to 20% of NH residents. In California, 14% of NH residents with dementia and related behavioral symptoms receive psychotropic medications despite an increased risk of side effects which can lead to falls and injury. Providers often prescribe psychotropic medications as first-line treatment for symptoms associated with dementia. Non-pharmacological approaches such as music therapy

may improve dementia-related behaviors and decrease the use of psychotropic medications among residents with dementia.

Methods: This was a pretest-posttest quality improvement project with two-weeks pre-intervention and eight weeks of intervention in a single NH. Ten NH residents experiencing dementia with associated agitation and aggressive behaviors and on as needed psychotropic medications were recruited. They participated in twice-weekly, 30-minute, individualized passive music therapy delivered with MP3 device players and headphones. Residents and family were contacted to determine music choices. Prior to intervention, one 60-minute training session was provided to nursing and activity staff. Participants' demographic and medical information were collected from electronic medical records and the most recent Minimum Data Set 3.0. Pre-intervention and intervention data on frequency and severity of agitated and aggressive behaviors and frequency of as needed psychotropic medication administration was collected from medication administration records (MAR) and an investigator-developed behavior monitoring tool (IDBM). Mean frequencies of as needed psychotropic medications, agitation and aggressive behaviors and mean severity level for agitation and aggressive behaviors pre-intervention and post-intervention were compared from the MAR and from the MDS using t-tests.

Results: A total of 10 residents participated in the study (n=5 women) with a mean age of 80 years (standard deviation [SD] 10.9). There was a significant decrease in agitation frequency from pre-intervention (17.0, SD 6.9) to post-intervention (6.28, SD 4.6) ($p=.005$) and agitation severity also decreased but not significantly from pre-intervention (26.8, SD 12.11) to post-intervention (15.2, SD 9.85) ($p=.10$). Pre-intervention aggression frequency significantly decreased post-intervention (15.2, SD 9.85 versus 6.5, SD 4.5; $p=.01$) and aggression severity also decreased post-intervention (26.6, SD 9.0 versus 9.0, SD 9.7; $p=.02$). Use of psychotropic

medications decreased but not significantly and there was wide variation in psychotropic medication administration.

Conclusion: The results of the project affirmed low-cost passive music therapy twice weekly for 30 minutes significantly reduced aggression and agitation frequency and aggression severity. This project provides a systematic approach in use of music therapy in the management of the behavioral symptoms associated with dementia. The results of the project will contribute towards future research.

The dissertation of Karima Gulwani is approved.

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2022

This dissertation is dedicated to people living with dementia, and their families. Dementia is a progressive condition and has no cure. As dementia progresses, the need for supervision and assistance from family members and care providers increases. I also dedicate this dissertation to my mom and dad who are my strength and support. My loving husband Haider, who gave me courage to fulfil my mission. I thank my son Ammar, and my daughter Hijab who are my inspiration, and have always encouraged and supported me throughout this journey. My brothers, sisters, nieces, and nephews who supported my dream. My dearest childhood friend Amina and Dr. Fozia Firoz Ali who are my biggest inspiration throughout this journey. Dr. Shamsa Malik who encouraged me to pursue DNP degree. My mentor Dr. Anila Ladak and nursing home staff without them this project was not possible. My DNP colleagues and instructors who are a constant inspiration.

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CHAPTER ONE: INTRODUCTION

Dementia is a progressive condition without any cure. The disease process is characterized by deterioration in cognitive function such as memory, thinking, reasoning, language, and the inability to control emotion (Cho, 2018). Globally, 35.6 million people suffer from dementia, and the number continues to increase with projections of 65.7 million by 2030 and 115.4 million by 2050 (Prince et al., 2013). In the United States (US), approximately 5 million people aged 65 and over have dementia, and by 2060 it is projected to rise to 14 million (Centers for Disease Control & Prevention [CDC], 2020). Dementia is a leading cause of disability in older adults (CDC, 2020). Ninety percent of people living with behavioral symptoms of dementia cause caregiver burnout due to disabilities and dependence. The incidence of dementia associated with challenging behavior is highly common in nursing homes (NHs) and it is one of the reasons for admission. Neuropsychiatric symptoms such as depression, anxiety, and wandering are more common in NHs and vary from 25% to 80% (Ray et al., 2017). In the fourth quarter of 2013, 17% of NH residents received antipsychotic medications in California (Centers for Medicare and Medicaid Services [CMS], 2021). An increased risk of side effects (e.g., fatigue, dizziness) is associated with psychotropic medication use in older adults and can lead to falls and injury (Curkovic et al., 2016). Despite efforts and regulations, physicians are still prescribing antipsychotic medications as first line treatment for symptoms associated with dementia ([CMS], 2021).

Investigators have shown music therapy as an alternative approach to reduce behaviors associated with dementia, which can also improve cognitive function and mood (Ray & Gotell, 2018; Brancatisano et al., 2019). Music therapy has improved depressive symptoms associated with dementia in older adults and provides an outlet to express emotions (Ray & Götell, 2018).

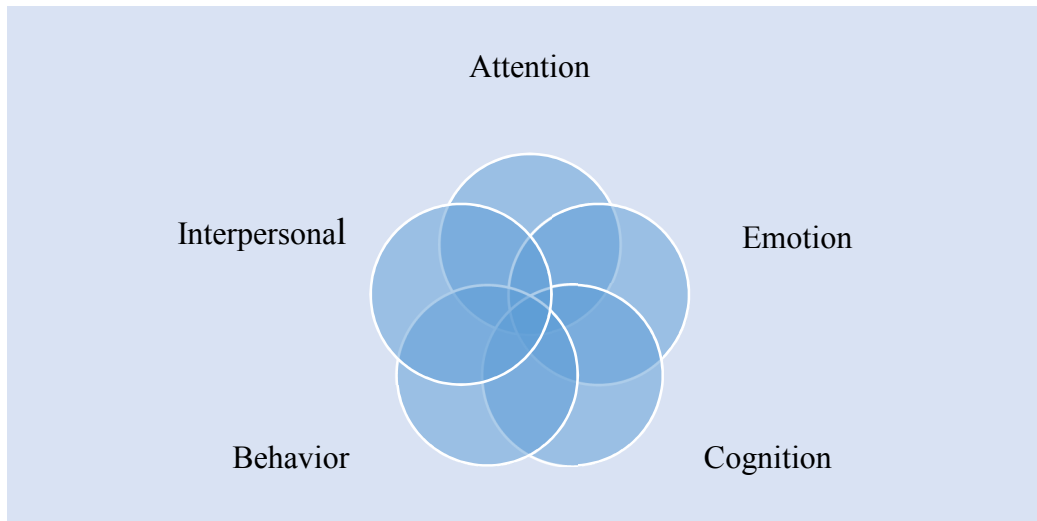
Several studies have been conducted evaluating use of non-pharmacological approaches such as music therapy (Vasionyte et al., 2013; Chang et al., 2015). Music therapy has been effective in managing patients living with dementia and related behavioral issues. Brancatisano and colleagues' (2019) suggested that music remains in the memory of patients with dementia even at the time of rapid cognitive decline (Brancatisano et al., 2019). Listening to familiar music and the ability of individuals to remember and engage are unique characteristics of music therapy (Brancatisano et al., 2019). Music improves autobiographical recall, which means memories can be retrieved automatically through music intervention (Brancatisano et al., 2019). Music therapy is easy to access and deliver. Recent technology has made it easier to access thousands of recorded songs. It is beneficial for residents living with dementia because it has no side effects, and it can help residents to move and express their emotions (Brancatisano et al., 2019). The purpose of this project was to examine frequency and severity of aggression and agitation behaviors and frequency of antipsychotic medication use among NH residents living with dementia and associated behavior symptoms who receive passive music therapy over a six-week period.

CHAPTER TWO: THEORETICAL FRAMEWORK

Music has a unique power, which affects emotions and the expression of inner feelings (Petrovsky, 2014). The application of music therapy has been used in a variety of clinical and non-clinical settings. It is a therapeutic way to connect with residents living with dementia. The theoretical framework assists future research and translating research into practice. For this quality improvement (QI) project, the Heuristic Working Factor Model to Music Therapy (hereafter Heuristic Model) (Figure 1) was utilized (Petrovsky, 2014). The Heuristic Model does not require music therapists and music therapy can be either active or passive. This newly proposed framework of music therapy brings five working concepts for music therapy: attention, emotion, cognition, behavior, and interpersonal. The concept of attention is focused on the power of music to attract and gain attention from others. The second concept of emotion is described as emotion modulation, which affects limbic and paralimbic structures of the brain (Petrovsky, 2014). Music can be a powerful emotion modulator for an individual response to either positive or negative past experiences. The third concept is a cognitive factor as music and the brain have a relationship. When music is perceived in the brain, it engages a person in processing its language, which requires memory. The fourth concept is behavior modulation, when music is used for therapeutic interventions, and focuses on how music therapy affects individual behavior (Petrovsky, 2014). The last concept is interpersonal or communication; music helps people communicate. Music therapy as singing with a group may assist in increasing ties between group members (Petrovsky, 2014). The Heuristic Model concepts such as attention, behaviors, and connection can be measured to determine outcomes related to music therapy interventions (Petrovsky, 2014). The outcome of this QI Project is focused on agitated and aggressive behaviors measured before and after the intervention. This model has been used to improve

behavioral symptoms associated with dementia in older adults in NHs (Petrovsky, 2014). Figure 1 shows the Heuristic Model and the application for this project.

Figure 1: *The Heuristic Working Factor Model for Music Therapy*

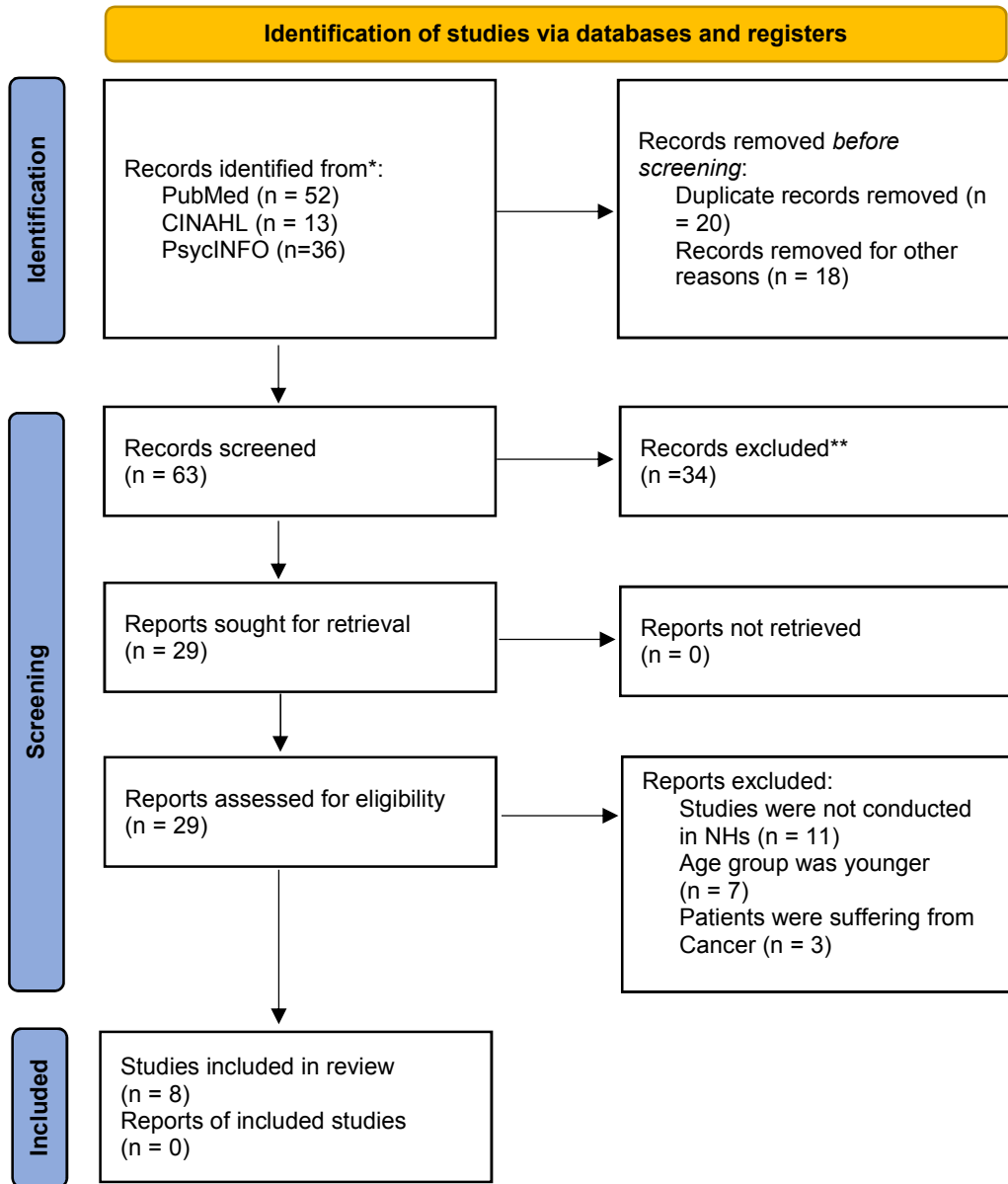


Note: The Heuristic Working Factor Model for Music Therapy evaluates five overlapping concepts, attention, emotion, cognition, behavior and interpersonal, which are affected by music. In this Quality Improvement project, the concept of behavior is measured to demonstrate outcomes of music therapy.

CHAPTER THREE: REVIEW OF LITERATURE

The databases used for literature search included PubMed, CINAHL Plus, and PsycINFO. The following key terms were used: “elderly”, “dementia”, “nursing home”, “psychotropic medications”, and “music”. The search was filtered to include articles involving clinical trials and meta-analysis and full text. The search yielded 52 articles from PubMed, 13 results were produced by CINAHL, and 36 results from PsycINFO. Of the 101 articles from all three databases, 20 were duplicates and 18 were not in English, leaving 63 articles. The 63 articles were further filtered with 34 articles excluded, which included meta-analyses and studies conducted in different settings such as acute hospitals and hospice settings (n=18), and some studies which required music therapists (n=16), leaving 29 potentially relevant articles. The initial review of the 29 articles was based on the abstract. Of the 29 articles, 21 were excluded due to various reasons such as: was not conducted in NHs (n=11); study age group was younger (n=7) and was conducted with patients suffering from terminal illnesses such as cancer (n=3). Eight relevant articles were reviewed and selected as supporting the music therapy intervention for the Scholarly Project. The eight articles were chosen due to music intervention, which included passive music therapy and the intervention duration. The eight studies included one meta-analysis, six pre-and post-design, and one randomized controlled study. Figure 2 shows the PRISMA diagram with the results.

Figure 2: PRISMA Diagram



Note: The PRISMA diagram provides an overview of the search results through various databases and screening of the literature results

* The eight articles were chosen due to music intervention, which included passive music therapy and the intervention duration.

** meta-analyses and studies conducted in different settings such as acute hospitals and hospice settings (n=18), and some studies which required music therapists (n=16)

Literature Review

The meta-analysis by Vasionyte et al., (2013) included 19 studies and a total of 478 residents living with dementia. Sample size in each study varied from 10 to 55 participants. The methods for music therapy included active music or music listening, selective or non-selective music, playing a musical instrument or singing, and live or recorded music. The outcomes measured in the studies included depression, anxiety, and agitation. The included studies measured depression and anxiety using the Geriatric Depression Scale and Rating Anxiety in Dementia Scale (Burke, et al., 1989). Behavior outcomes were measured by the Cohen-Mansfield Agitation Inventory (CMAI; Cohen-Mansfield, 1996), Multidimensional Observation Scale for Elderly Subject (MOSES; (Helmes at el.,1987) behavior chart lists and the Neuropsychiatric Inventory (NPI) tool (Lai, 2014). Results of the meta-analysis showed music therapy could be considered in both the early and late stages of dementia. Data did not indicate which types of music interventions are the most effective in achieving the positive outcomes. The effective outcome can be achieved by simply listening to music as compared to live music. The limitations of the study were small sample size in some of the selected studies.

Ray et al. (2017) conducted a clinical trial study using pre- and post-study design to examine the use of music therapy in three NHs in New York City for 132 residents living with dementia. Participants were selected by convenience sampling. The investigators focused on the following three common behaviors associated with dementia: agitation, depression, and wandering. A pre-screening was completed using Reisberg's Functional Assessment Screening Test (FAST; Auer & Reisberg, 1997). Residents who scored five and higher (which indicates behavior severity of moderate and greater on the FAST) were selected for the study. Music was selected based on the resident's preferences and families' suggestions. Music sessions were

conducted three times a week for two weeks. The Cornell Scale for Depression in Dementia (CSDD; Alexopoulos et al., 1988), the Algase Wandering Scale (AWS; Algase, Beattie, Bogue, Yao, 2001), the CMAI (Cohen-Mansfield et al., 1989), Mini Mental Status Examination (MMSE; Folstein, et al., 1975) and FAST (Auer & Reisberg, 1997) were used to measure outcomes. The CSDD is an assessment tool with 19 questions, which measures severity of depressive symptoms. Researchers confirmed the reliability of the tool in NH setting. The AWS tool consists of 28 questions (score range 32-74), which assess dimensions of wandering and irritability. The validity of the AWS was supported by the ability to differentiate between wandering and non-wandering behaviors. The CMAI tool has been used in NHs, with moderate to good reliability (score range 34-128). The FAST is a reliable tool that evaluates severity of resident's functional abilities and activities of daily living (ADLs) in varying stages of dementia. The common behaviors targeted were symptoms of depression (n=71, 54%), wandering (n= 33, 25%), and agitation (n=28, 21%). After two weeks of music therapy agitation and depression scores reduced significantly and wandering did not decrease. Assessments were performed with certified nursing assistants (NAs) (with unknown blinding to study participation) and may not have been recorded accurately. The strength of the study was the large sample, which allowed for small groups of residents to implement this project.

McCreeedy, et al. (2019) conducted a pre-post intervention study to test a six-month music therapy intervention with NH residents living from dementia who were experiencing agitation and aggressive behavior. Initially 45 residents at four NHs participated in this study. Agitation and aggressive behaviors were assessed pre- and post-intervention using a direct observation tool, the Agitation Behavior Mapping Instrument (ABMI; Kafer et al., 1988) completed by research staff, along with the CMAI. The ABMI records the number of physically and verbally

abusive agitated behaviors observed by nursing staff. Higher score indicates more agitation.

Administrative data was collected from Minimum Data Set (MDS) a multi domain assessment completed for all NH residents. Of 45 residents, only 31 residents were exposed to the music intervention. The remaining residents were dropped due to death or hospitalization, and some were never exposed to the music intervention. Individualized music therapy was conducted at the time when residents were expected to have aggressive behavior based on resident history. ABMI scores revealed a significant decrease in behavioral symptoms (pre intervention 4.1, SD 3.0, post intervention 1.6, SD 1.5, $p = .01$). The limitations were small sample size, and music selections based on resident's preference when they were 16 to 26 years old. The study strength is use of a low-cost music therapy intervention that resulted in behavior improvement.

King and colleagues (2018) conducted an observational study to examine the relationship between personalized music intervention and residents living with dementia using functional Magnetic Resonance Imaging (fMRI). After screening 22 potential persons, 17 participants living with Alzheimer's disease were enrolled. Exclusions included persons with high motion during MRI procedure ($n=4$) and visible artifacts on bold image ($n=1$). Prior to music therapy implementation, identification of a preferred music list was taken from caregivers. An iPod was used as the portable music-playing device. After listening to music, an fMRI was completed to evaluate neural activity or view any brain wave changes with images of subcortical regions of the brain. Results showed after listening to their preferred music, participants showed an increase in MRI connectivity involving corticocortical and corticocerebellar connections, suggesting that in residents with advanced dementia, their domain of music memory function remains preserved. Even though the mechanism of the brain response is not well known, familiarity of the music is directly related to the brain response. Selected music played in reversed and forward, and both

reversed and forward showed elicited activation in both auditory cortex area of frontal, left lateral and cerebellum areas of the brain. The limitations of this study included a small sample size and the single image film technique. Because of the limited films, only subcortical regions of the brain were visualized so other areas may have shown more changes. In addition, the study used familiar music and did not compare the results with unfamiliar music. Despite limitations, the study findings support music therapy for increasing the brain's functional connectivity.

Guertin, et al. (2009) conducted a randomized controlled study to determine if music therapy affects the behavior of NH residents living with dementia. The intervention and control groups consisted of 15 participants each. Inclusion criteria were NH residents with mild to moderate dementia, male or female from the age of 75 to 95 with adequate written and verbal expression with visual and hearing abilities determined by electronic health records. The intervention group participated in weekly-individualized listening music sessions whereas the control group participated in reading sessions. Individualized music sessions were conducted once a week for 20 minutes for 16 weeks. Music was selected by participants, arranged in sequence for 20 minutes per session and introduced through headphones in the participant's room in sitting or supine position. The duration of the project was 24 weeks with music session intervention for 16 weeks. Outcomes were measured at weeks 1, 4, 8, 16 and 24 by neuropsychologists using the Hamilton Anxiety Scale (HAS; Predescu et al., 1969) lower scores indicate less anxiety, MMSE (Folstein, et al., 1975) and GDS (Burke, et al., 1989) (lower scores indicate less depression). After 16 weeks of music therapy, the music therapy group showed 60% improvement in anxiety based on HAS scores compared to 4.3% improvement in the control group. HAS scores were significantly lower for the music therapy group (8.4, SD 3.7), compared to the control group (20.8, SD 6.2). At week 16, the music therapy intervention was completed,

and outcomes were measured post intervention at 24 weeks, with sustained significant decrease in anxiety in the music therapy group compared to the control group. Depression also improved. At week 16, the level of depression was significantly decreased in the music therapy group (8.9, SD 3.3) versus the control group (11.2, SD 6.1) and this decrease remained at week 24. No significant changes were noted in cognition as measured by MMSE scores for the two groups. The results indicate that music therapy has beneficial effects in reducing the symptoms of anxiety and depression. The individualized weekly music session for 20 minutes duration is feasible to apply for NH residents living with dementia.

Sakamoto, et al. (2013) conducted a randomized controlled study to determine if music therapy can reduce behavior and psychological symptoms (BPSD) in NH residents with severe dementia. Thirty-nine NH residents living with dementia participated with random assignment to one of two intervention groups or the control group (each group n=13). The intervention groups included passive and active music therapy. Music sessions were conducted once a week for 30 minutes for 10 weeks. Resident and family preferred music was used for the therapy. Passive music therapy was introduced with a cassette deck (CD) player without interaction with a music therapist. The active music therapy included the CD player and interaction with a music therapist. The control group did not receive music therapy. Short- and long-term outcomes were assessed and completed by four registered nurses and two occupational therapists. Short-term outcomes of heart rate (HR) and heart rate variability (HRV) as measures of stress and observed facial expressions using the Faces tool were measured five minutes before and immediately following music therapy interventions (Sakamoto, et al., 2013). Stress was measured indirectly using both HR and HRV as measures of autonomic nervous system stimulation where high HR and HRV imply sympathetic stimulation and higher levels of stress and low HR and HRV imply

parasympathetic stimulation and lower stress. The Faces Scale tool is frequently used by psychologists to assess patient's emotions (McKinley et al., 2003). The long-term outcomes were measured at ten weeks using the Behavioral Pathology in Alzheimer's Disease (BEHAVE-AD) tool, scores range from 1 to 4, lower scores indicate less behaviors. BEHAVE-AD is a reliable tool that has been used to measure behavior outcomes associated with Alzheimer's disease (Reisberg et al., 2014). In this study the BEHAVE-AD tool was completed two weeks before the intervention, at three weeks of music sessions and after 10 music sessions were completed. The short-term effect of music intervention in both passive and interactive group indicated dominant parasympathetic activity (lower stress) and increased relaxation as measured by the Faces scale. No significant differences existed for the control group. The long-term results showed a decrease in the BEHAVE-AD scores for both passive and active music therapy groups compared to the control group. One of the limitations of the study was selection was limited to residents with severe dementia and residents with mild to moderate dementia were excluded. A strength of this study is the inclusion of physiologic data and short- and long-term outcomes.

The purpose of a two-group quasi-experimental pre-and-post design study by Zafra et al. (2018) was to evaluate a bi-weekly music therapy intervention over eight weeks with 19 residents with dementia (control n=10; intervention n=9) at a single NH. The inclusion criteria included: Alzheimer's disease, age 65 and over, and ability to communicate. Participants were excluded if they had cerebrovascular accident, alcohol, and drug use, or hearing loss based on medical records. The control group received routine care and no music therapy. The intervention group received 45 minutes of music therapy, provided by nursing staff, twice a week for eight weeks. Outcomes assessed were cognition as evaluated with the MMSE, depression and anxiety measured with the Goldberg Depression and Anxiety Scale (GDAS) (Goldberg et al., 1988)

(scores 0 to 9, higher scores indicate more depression and anxiety) and balance measured with the Tinetti test (scores 0 to 2, higher scores indicate more balance). Outcomes were collected pre-and post-intervention at eight weeks. Cognition did not change. Depression significantly improved for those in the music therapy group (GDAS scores: pre intervention 1.44, SD 1.26; post intervention 1.56, SD 1.59; $p=.01$) with no improvement in the control group (GDAS score pre-intervention 2, SD 1.41; post intervention 2, SD 1.73; $p=.89$). Results showed bi-weekly music therapy reduced depression symptoms in older adults with Alzheimer's disease. The strength was demonstrating music therapy could be implemented by nursing staff. The study occurred in Spain; however, the type, frequency, and duration of music therapy used support this QI project.

Cho (2018) conducted a randomized controlled trial, in a single 242-bed Veteran's NH in New York City to evaluate passive and active music therapy compared to television (TV) for 52 Veteran NH residents with dementia. Inclusion criteria included age 65 to 100 years, no hearing loss, and ability to sit in a chair or wheelchair for an hour. Exclusion criteria included severe psychiatric illnesses, and expressive language problems. Participants were randomly assigned to active music therapy-singing group (active $n=18$), passive music therapy-listening group (passive $n=17$), and a control-TV ($n=17$) group. Participants received a 40-minute session twice a week for four weeks. The active group programs were planned and conducted by a Board-Certified Music Therapist. The lists of songs for the passive group were developed reflecting participants' preferences. Activity staff provided interventions and conducted outcome assessments. Outcomes, measured pre and post intervention, were quality of life measured with the Quality of Life-Alzheimer's Disease (QOL-AD) tool (Hoe et al., 2005) (score range excellent to poor) and affect measured with the Positive and Negative Affect Schedule (PANAS) (Watson

et al., 1988) (range 1-4, high scores indicate better affect). The active group showed significantly improved quality of life and positive affect between pre-and-post interventions on QOL-AD and PANAS. The passive group demonstrated no change in QOL and slight increase of positive affect although not significant (PANAS score pre-intervention 28.21, SD 6.20; post intervention, 31.00, SD 4.71, $p=0.12$). The control-TV group showed no change in QOL and a decrease in positive affect although this was not significant. Of the 52 participants, only 37 completed the assigned interventions. A major limitation of the study was high attrition with a small number of participants who completed the intervention. Replication of this study in NHs may require additional financial resources to engage music therapists to develop the active music therapy-singing program.

Synthesis of Literature Review

A total of eight articles were selected for this QI project. Seven research studies were conducted in NHs (Ray et al., 2017; Guertin, et al., 2009; Sakamoto, et al., 2013; Cho, 2018; Zafra et al., 2018; McCreedy, et al., 2019; Vasionyte et al., 2013), and one study was performed in the outpatient setting (King et., al 2018). Studies included one meta-analysis (Vasionyte et al., 2013), three pre-and post-intervention trials (Zafra et al., 2018; McCreedy, et al., 2019; Ray et al., 2017), and three randomized controlled trials (Guertin, et al., 2009; Sakamoto, et al., 2013; Cho, 2018). One study was unique and utilized functional MRI to record neural activity or brain wave changes (King et., al 2018).

Three common behaviors among residents living with dementia that were assessed in the studies were agitation (Ray et al., 2017; McCreedy, et al., 2019; Vasionyte et al., 2013; Zafra et al., 2018; King et., al 2018; Sakamoto, et al., 2013; Guertin, et al., 2009; Cho, 2018), wandering (Ray et al., 2017), and depression (Ray et al., 2017; Zafra et al., 2018; Vasionyte et al., 2013;

Guertin, et al., 2009). The samples in all the studies were based upon diagnosis of dementia and age over 65 years. One study specified diagnosis of severe dementia (Sakamoto, et al., 2013). One study included outcomes measured by neuropsychologists (Guertin, et al., 2009). A common exclusion was hearing loss (Zafra et al., 2018; Cho, 2018; Guertin, et al., 2009; King et al., 2018). The common limitation of all the studies was small sample size. All studies concluded that music therapy helps in managing agitation among residents living with dementia. A variety of tools were used to monitor outcomes, pre- and post-intervention including: Rosberg's functional assessment test (Ray et al., 2017), Cornell Scale for Dementia assessment tool for depression screening (Ray et al., 2017; Zafra et al., 2018; Guertin, et al., 2009), Agitation Behaviour Mapping Instrument (ABMI; McCreedy, et al., 2019), Cohen Mensfield Agitation Inventory (CMAI; McCreedy, et al., 2019; Ray et al., 2017), FAST (Ray et al., 2017), Mini Mental Status Exam (MMSE; Ray et al., 2017; Zafra et al., 2018), Quality of Life Alzheimer's Disease (QOL-AD; Cho, 2018), Positive and Negative Affect Schedule (PANAS; Cho, 2018), Multidimensional Observation Scale for Elderly Subject (MOSES; Vasionyte et al., 2013), NPI (Vasionyte et al., 2013), Behavioral Pathology in Alzheimer's disease (BEHAVE-AD) (Sakamoto, et al., 2013), and the Minimum Data Set (MDS; McCreedy, et al., 2019). Music therapy interventions were conducted by nursing/activity staff (Ray et al., 2017; King et al., 2018; Cho, 2018; Zafra et al., 2018), or by a certified music therapist (Cho, 2018) for the minimum duration of 20 minutes (Guertin, et al., 2009) and maximum duration of 45 minutes (Zafra et al., 2018).

Music was introduced in either active or passive form (Guertin, et al., 2009; King et al., 2018) or both (Sakamoto, et al., 2013; Vasionyte et al., 2013). Intervention duration ranged from 2 (Ray et al., 2017) to 16 weeks (McCreedy, et al., 2019). All studies showed behavior

improvement after music therapy, and low cost with an easy implementation process for music therapy. The average duration of music therapy in the studies was 20 to 30 minutes from once a week to twice a week. In this project the duration of the music therapy was 30 minutes twice a week for six weeks.

CHAPTER FOUR: METHODS

Sample and Setting

The project took place in one 240-bed NH in Southern California on two floors which house residents living with dementia. The NH reported an average of 40 residents with dementia of which 25 showed agitation or aggressive behaviors and 20 received psychotropic medications. Average length of stay for residents with dementia is from six months to four years. The project was exempt from the Institutional Review Board (IRB) since it is a quality improvement project.

Inclusion criteria were age 65 years or older, no hearing deficits as documented in the Electronic Health Record (EHR), admission diagnosis of dementia of any type as documented on the most recent Minimum Data Set assessment (MDS), documentation of moderate to severe agitation and/or aggressive behaviors a minimum of twice a week and receiving psychotropic medications. Exclusion criteria were age under 65 years, no diagnosis of dementia, no documentation of aggressive or agitated behaviors, no psychotropic medications received, and hearing loss. Based on resident characteristics at this NH, 20-22 residents were estimated to be eligible for participation.

Data Collection

Data for this QI project included demographic and medical data and behavioral and medication administration data all collected from the EHR and MDS. An investigator developed EHR abstraction tool was utilized to abstract all data (Appendix A).

Demographic and Medical Record Data

Demographic and medical information was obtained from the most recent full MDS 3.0 prior to intervention implementation, specifically from sections B, C, D, E, and G. Cognitive

status was obtained from section C, depression screening from section D, behavior from section E, functional abilities from section G and hearing ability from section B. Additionally, the DNP student completed MDS section D Mood and E Behavior assessments during the two-week pre intervention period and at completion of the 6-week intervention. Total scores for MDS section D & E were calculated using mean and standard deviation. The MDS section D incorporates the Patient Health Questionnaire (PHQ-9) instrument which measures mood and depression with scores ranging from 0 to 27 with higher scores indicating more symptoms of depression (Kroenke, et al., 2001).

Aggressive and Agitated Behavioral Data

Licensed Vocational Nurse (LVN) staff's daily documentation of frequency and severity of aggressive and agitated behaviors from the Medication Administration Record (MAR) and an investigator-developed behavior monitoring tool (IDBM) were collected by the DNP student. The frequency and severity of agitation and aggressive behaviors are part of routine documentation on the MAR by the licensed nursing staff. This documentation is required for all residents with a psychotropic medication order and must occur every eight-hour shift. Severity of agitation and aggressive behaviors are rated on a 1 to 3 scale where the score of 1 indicates mild intensity, 2 indicates moderate intensity, and 3 indicating severe intensity. The licensed nursing staff was educated by the DNP student to review how to identify and score daily behavior severity. For example, mild behavior symptoms are behaviors that can be resolved easily and are only exhibited once a day, while moderate agitation occurs 2-3 times a day, and severe agitation 4-5 times a day. Agitation and aggressive behavior frequency and severity data were collected daily and summed (frequency) or averaged (severity) each week for two weeks pre intervention

and throughout the six-week intervention. Behaviors were documented on the MAR and the IDBM for each participant every 8 hours by licensed nurses.

Psychotropic Medication Administration Data

Daily documentation of frequency of as needed psychotropic medication administration from the MAR in the EHR was collected. Psychotropic medication administration was documented by licensed nurses in the NH. Each week daily psychotropic medication administration frequencies were summed for weekly frequency.

Procedure

Before the implementation of the music therapy, the DNP student provided an educational session for nursing and activity staff. A one-hour in-person session was conducted with nursing staff and a one-hour session with activity staff. Training was provided on music therapy sessions, resident's behavior monitoring criteria and documentation.

The intervention was a passive music therapy delivered by listening to recorded music through MP3 players and headphones. During pre-intervention, music was selected based on the resident's and family's preferences obtained by asking for preferences and through phone calls. A preferred music list was developed for each resident. Activity staff and the DNP student conducted 30-minute music therapy sessions twice a week (Tuesday and Thursday), from 10:00 am to 11:30 am and from 1:00 pm to 4:30 pm for 6 weeks. The duration, frequency, and length of the music therapy were chosen as studies reported three to eight weeks of music therapy twice a week from 20-40 minutes can improve aggressive and agitation among dementia residents (Guertin, et al, 2009; Sakamoto, et al, 2013; Zafra, et al., 2018). Activity staff and the DNP student monitored each participant session to replace headphones if removed. Weekly meetings were held with NH staff to discuss progress and any intervention issues. Further, the DNP

student collected informal notes during the intervention related to observations of participants' tolerance of the intervention, participant comments about the intervention, and nurses and activity staff comments about the intervention.

Analysis

Data were collected from daily behavior monitoring log. The data analysis was conducted using IBM Statistical Package for Social Sciences (SPSS)-27. The demographic, medical and MDS data were analyzed descriptively and used to describe the participants' characteristics. Pre-intervention data of week one and two were compared to post-intervention data from the last two weeks of the project during the intervention, using t test statistics for: 1) frequency of agitation and aggressive behaviors, 2) severity score of agitation and aggressive behaviors, and 3) frequency of psychotropic medication administration. Frequency of agitation and aggressive behaviors from the two-week pre-intervention assessments was summarized as a mean frequency and compared to the mean frequency of post-intervention using t-test statistics. Similarly, the mean severity score of agitation and aggressive behaviors for the two-week pre-intervention assessments were compared to the mean severity score for post-intervention using t-test statistics. Statistical analysis was performed using $\alpha = .05$ significance level.

Evaluation Criteria and Expected Outcomes.

Evaluation criteria between pre- and post-intervention were: 1) decreased frequency of participants' agitation and aggression behaviors and psychotropic medication administration, 2) decreased severity of participants' agitation and aggression behaviors, and 3) decreased MDS section D Mood and E Behavior assessment scores. The aim was a reduction in frequency of severe, moderate, and mild agitation and aggression, modest improvement in severity, and decreased psychotropic medication administration.

CHAPTER FIVE: RESULTS

Ten residents (n=10) participated in this project. Of 10, one participant was admitted to the hospital twice during the project implementation phase, and did not participate for the entire period of intervention. Participants were 50% female, 50% Black, and with a mean age of 80 years (standard deviation [SD] 10.9). Participants had a diagnosis of dementia with no specification on type of dementia and were all receiving psychotropic medications. Pre-intervention demographic data collected from MDS indicated that participants were receiving psychotropic medications which included antianxiety, antipsychotic and antidepressant medications. Of ten participants five residents were receiving antipsychotic medication and five were receiving antidepressant medication. Two participants were receiving both antianxiety and antipsychotic medications. None of the participants were living with hearing impairment. Most of the participants required extensive to total assistance in bed mobility, transfer, walk in the room and walk in the corridor. The Patient Health Question (PHQ-9) which is a depression screening tool indicated mild depression 2.4 (SD 3.6) for participants during the two weeks of pre-intervention. All participants were living with dementia and the MDS Brief Interview for Mental Status (BIMS) for cognitive screening mean score was 6.2 (SD 4.7), which indicates participants had moderate to severe cognitive impairment. Table 1 provides the participants' demographic and medical characteristics.

Table 1: *Participants Characteristics (n=10)*

Characteristics	Mean (SD) or % (n)	Range
Age-years	79.9 (10.9)	65-97
Gender-male	50 (5)	-
Race/ethnicity		-
Black	50 (5)	
White (non-hispanic)	50 (5)	
Section G MDS* Activities of Daily Living (ADL) self-performance Bed Mobility	3 (8.2)	1-4
Section G MDS ADL self-performance Transfer	4 (2.2)	1-7
Section G MDS ADL self-performance Walk in room	5.6 (2.7)	1-8
Section G MDS ADL self-performance Walk in corridor	6.1 (2.6)	1-8
Section E MDS Mood Severity**	1.1(.87)	0-2
Section D. Patient Health Question (PHQ-9) Depression score [#]	2.4 (3.6)	0-9
Section C. Brief Interview for Mental Status (BIMS) ^{###}	6.2 (4.7)	0-14
Doctor of Nursing Practice (DNP) PHQ-9 Depression Score	2.4 (3.6)	0-9
Number of Participants receiving Anti-psychotic Medication	5	0-5
Number of Participants receiving Anti-depressant Medication	5	0-5
Number of Participants receiving Anti-anxiety Medication	2	0-2

*Minimum Data Set (MDS) activities of daily living self-performance scores range 1-4 with 1=supervision- 4= totally dependent; **Mood severity score range 0-3 with 0=none, 3=frequent; [#]PHQ-9 scores range from 0-30 with high score indicating more severe depression; ^{###}Brief Interview for Mental Status Cognitive score range 0-15 with high score indicating more cognitive impairment.

Behavior and Medication Results

There was a significant decrease in weekly frequency of agitation behaviors from pre-intervention (17.0, SD 6.9) to post-intervention (6.28, SD 4.6; p=.005). The weekly mean severity of agitation also decreased, but not significantly, from pre-intervention (26.8, SD 12.11)

to post-intervention (15.2, SD 9.85; $p=.10$). Pre-intervention weekly frequency of aggression also significantly decreased in post-intervention (16.7, SD 8.1 versus 6.5, SD 4.5, respectively; $p=.01$). Weekly mean severity of aggression significantly decreased in post-intervention (20.6, SD 9.0 versus 9.0, SD 5.7, respectively; $p=.02$). Overall, there was a significant improvement in the weekly frequency of agitation and aggressive behavior.

During the two weeks of pre-intervention documentation of participant's moderate or severe aggressive behavior ranged from 4 to 19 occurrences, and this decreased during intervention to 0 to 12 occurrences of moderate or severe aggressive behaviors. Two participants experienced a considerable decrease in moderate or severe aggressive behaviors with one participant decreasing from 19 occurrences in pre-intervention to one occurrence during intervention and a second participant decreased from nine occurrences in pre-intervention to two occurrences during intervention. All but one participant experienced a decrease in documentation of moderate or severe aggressive behavior. Similar to aggressive behaviors, during the two weeks of preintervention documentation of moderate or severe agitation behavior ranged from 4 to 18 occurrences decreasing to one to 10 occurrences during intervention. Three participants experienced an extensive decrease in moderate or severe agitation behaviors during intervention; one participant decreased from 18 to two occurrences; one participant decreased from 15 to three occurrences and one participant decreased from 11 to four occurrences. Two participants did not show any decrease of moderate or severe agitation behaviors during intervention.

Use of psychotropic medications was decreased but not significantly and there was a wide variation in psychotropic medication administration. Fifty percent of participants were receiving antipsychotic medications on routine basis such as Risperidone and Aripiprazole. Five participants were receiving anti-depressant medications on routine basis such as Mirtazapine and

Sertraline. One participant was receiving both routine antidepressant and as needed anti-anxiety medications. At the end of the fourth week of music intervention, one participant's psychotropic medication was discontinued as receiving music therapy was successful for behavior management. Outcomes of behavior frequency and severity and medication use for pre-intervention and post-intervention are presented in Table 2.

Table 2: *Agitation and Aggressive Behavior Frequency and Severity and Medication Outcomes*

Outcomes measured over 2 Weeks	Pre-intervention Mean (SD)	Post-Intervention Mean (SD)	P Value
Agitation Frequency	17.0 (6.9)	6.28 (4.6)	.005
Agitation Severity	26.8 (12.11)	15.2 (9.85)	.104
Aggression Frequency	16.7 (8.1)	6.5 (1.7)	.010
Aggression Severity	20.57 (8.99)	9.0 (5.71)	.019
Frequency of PRN Psychotropic Medication doses	60.5 (122.98)	21.0 (66.4)	.19

Note: Above data on behavior severity and frequency was collected during weeks 1 & 2 pre-intervention and the last two weeks of the intervention period.

The DNP student conducted MDS section D PHQ-9 pre-intervention assessment score was 1.2 (SD 1.1) as compared to post-intervention score 0.5 (SD 0.2; $p = .004$). The DNP student conducted MDS section E behavior score conducted pre-intervention was 2.2 (SD 1.3) versus the post-intervention score 0.8 (SD 0.6; $p < .001$) both of which show significant improvement in behaviors. Table 3 reflects the results of MDS section mood scores and section E behavior scores as measured by the DNP student.

Table 3: *Pre-and Post-Intervention MDS Section D Mood and E Behavior Results*

MDS Sections	Pre-Intervention Mean SD	Post-Intervention Mean SD	P Value
Section D PHQ 9	1.2 (1.1)	0.5 (0.2)	.004
Section E Behavior	2.2 (1.3)	0.8 (0.6)	<.001

Note: Pre-intervention collected during weeks 1 and 2 of pre-intervention and post-intervention during the last two weeks of intervention period.

Informal Notes Results

Observations made during the pre-intervention period included accuracy and frequency of behavior monitoring by the License Vocational Nurses (LVNs). During informal interviews with six LVNs, it was revealed that even though some participants' behavior was severe, nurses would score it as mild or moderate. According to the LVNs, if behavior scores were high more interventions had to be added to the resident's care plan as well as calls to providers to increase medication dosages. The LVNs were encouraged to document accurately on the IDBM tool.

From the informal notes collected during the intervention, over 50% of the participants expressed desire to keep listening to the music longer than the 30-minute intervention. Informal notes show some of the participants frequently asked to add more music on their individual music list selected during pre-intervention. During the last two weeks of the intervention, LVNs shared their observations that some of the participants had shown improvement in their mood and behavior. For example, the nursing staff noticed that residents seemed less agitated and aggressive than during the pre-intervention period.

CHAPTER SIX: DISCUSSION

This QI project reports the effect of 30-minute, bi-weekly passive music therapy on frequency and severity of agitation and aggressive behavior and psychotropic medication use among ten nursing home (NH) residents with dementia. The results of this project support the hypotheses in part: nursing home residents with dementia showed significant decrease in the frequency of agitation and aggressive symptoms at post-intervention, compared to pre-intervention. The participants also showed a significant decrease in severity of aggressive symptoms. Participants showed a trend of decrease in the severity of agitation and number of psychotropic medications administered after receiving the intervention. Additionally, they showed significant decrease in the MDS-based depression and behavioral symptoms at post-intervention, compared to pre-intervention.

These findings affirmed that music therapy can significantly reduce the frequency of agitation and aggressive symptoms in residents living with dementia. During the intervention, the frequency of moderate to severe agitation behaviors showed a significant decrease after six weeks of music intervention. Similarly, Ray et al., (2017) also reported a significant reduction in agitation after two weeks of music intervention three times a day. Our findings showed a decrease in agitation behaviors using a longer six-week intervention with less intensity, only twice a week. The dose of music intervention in this QI project is similar to the study of Zafra et al. (2018), which used biweekly music therapy over eight weeks and showed reduction in anxiety-related symptoms. McCreedy, et al. (2019) also showed an individualized music therapy significantly decreased agitation symptoms over six months. Our project duration of the music therapy intervention was six weeks and showed a significant reduction in the behaviors. Others have shown that 20 minutes twice a week of music therapy can reduce the symptom of anxiety

which can lead to agitation (Guertin, et al., 2009). Ray et al. (2017) showed reduction in the agitation after listening to favorite music three times a week for two weeks. Similarly in this QI project, favorite music was introduced through MP3 and headphones, and after six weeks of music therapy a significant reduction in severity and frequency of agitation and aggressive behavior were observed. This may suggest potential benefits of music therapy tailored to each individual's preferences on managing dementia-related behavioral symptoms. The fourth concept of the Theoretical Framework is behavior modulation, which focuses on how music therapy effects individual behavior (Petrovsky, 2014). This project supports this concept.

During the intervention period, the frequency of aggressive behavior among participants receiving music therapy significantly decreased. In addition, there was reduction in the severity of aggression. In McCreedy, et al. (2019) study after six months of individualized music therapy they also showed considerable decreases in severity of aggressive behaviors.

This project was short duration of six weeks, and yet we showed a slight decrease in psychotropic medication use. In the studies of Guertin, et al. (2009); Ray et al. (2017); and Sakamoto et al. (2013), no change in the psychotropic medication regimens was observed. In this QI project, we show a slight decrease in the use of as needed anti-anxiety medication.

Implications for Research

There is a need for future research of a longer duration and with more participants to monitor the long-term effect of music therapy and whether music therapy intervention helps to reduce the psychotropic medication usage for the treatment of behavioral symptoms. A longer study duration would allow evaluation of whether music therapy has a sustained effect on agitation and aggressive behaviors over time.

Our project included only one active group in pretest-posttest experimental design. A future study needs to test a music therapy in comparison to a control group with a larger sample size in a randomized controlled trial design. This will assist in comparing the results between two groups and assist with further examination of music therapy as a successful intervention. Our study participants were limited to the residents living with moderate to severe dementia and receiving psychotropic medications for the behavioral symptoms. Therefore, the feasibility of our music therapy among those with mild dementia is unknown. Future studies are needed to test the potential benefits of our music therapy among NH residents with wide ranges of dementia severity, thus identifying the subgroup who is the most sensitive to music-based approaches. This will assist in examining music therapy as a method of managing residents' behavioral symptoms at even early stages of dementia or mild cognitive impairment.

For future QI projects it will be useful if group music therapy and active music therapy such as singing, and dance can be included. Both active and passive music therapy have been evaluated in the past and both have shown improvement in participants' behaviors. Sakamoto et al. (2013) and Cho (2018) included both active and passive music therapy in their studies and they demonstrated improvement in cognitive and emotion function and thus improved their quality of life.

In this QI project, we showed a significant decrease in agitation and aggressive behavior symptoms associated with dementia using twice a week passive music for thirty minutes each session. Similar to this QI project, Zafra et al. (2018) also used biweekly music therapy over eight weeks and showed improvement in agitation and aggressive behaviors. Zafra et al. (2018) and Ray et al. (2017) studies examined reduction in the agitation after listening to favorite music three times a week for two weeks. This QI project also used favorite music, which was

introduced through MP3 players and headphones, and after six weeks of music therapy a significant reduction in severity and frequency of agitation and aggressive behavior were observed.

Implications for Practice

Most of the studies affirm that the music therapy is low cost, workable and can be implemented by nursing home nursing and activity staff (Guertin, et al., 2009; King et al., 2018; Sakamoto et al., 2013; Vasionyte et al., 2013; Ray et al., 2017). This QI project was low cost and implemented by DNP student and activity staff. Residents' behavior was observed and recorded by LVNs. The cost of this QI project for ten participants was less than \$400 which included ten MP3 players, ten headphones, a storage box, and disinfectant. This QI project provides an opportunity to change the practice associated with dementia care in the NH settings. Nursing practice needs to be focused on individualized care and non-pharmacological approaches as a first-line treatment for dementia-related behaviors. This project provides a systematic approach in the use of individualized music therapy in the management of the behavioral symptoms associated with dementia. The music therapy is safe to implement, we observed no side effects, and it was easy to implement. Passive music therapy could be a part of residents' routine activities administered anytime of the day. This QI project could easily be implemented in the other NHs.

Sustainability

Project sustainability relies on an organization's readiness to change. The NH in this project has adopted other changes and was ready to continue to implement new approaches such as the music therapy intervention. The NH culture and key stakeholders such as administrative staff, nursing staff, physicians, activity staff, and family members play key roles in sustainability

(Fazio et al., 2020). In this project, there was support from key stakeholders and the NH culture was open to the intervention. This project will provide an example for use in other NHs. This is a low-cost project and may not require any additional staff to implement.

Limitations

This QI project was limited to a small sample size which limited more robust analyses and limits generalizability of the results. Although there were more residents living with dementia present in the NH, they were not receiving psychotropic medications for behavioral symptoms. Therefore, those residents were excluded. There was no control group due to limited sample size.

In addition, this project was limited to passive music therapy since group music therapy could not be included due to COVID-19 restrictions. There was a possible assessment bias of the behavior-monitoring log. As noted, some of the LVNs were not recording behavior accurately during pre-intervention. Nursing education was provided to limit assessment bias. High staff turnover rate, and incoming new staff's ability to participate in the project also affected the project. The facility is facing challenges retaining employees and constantly hiring new employees especially LVNs and Certified Nursing Assistants (CNAs) and this may have affected assessment of behaviors.

CONCLUSIONS

The results of this QI project demonstrate a significant improvement in behaviors and reduced episodes of agitation and aggression behaviors associated with dementia. The results of this project are consistent with other studies showing effectiveness of music therapy for residents living with dementia. The results of this project support that music therapy can be used as part of daily care for residents living with dementia and be considered as a multidisciplinary and individualized approach for older adult residents living with dementia. Most of the nursing home activities are offered as group activities and lacking individualized care accounting for individuals' need and preferences. Adopting music therapy for residents living with dementia provides an individualized resident approach. Music therapy as a part of daily activity for residents living with dementia may decrease agitation and aggressive behaviors, lessening care burden and increasing quality of life for residents.

Challenging behaviors are prevalent in NH residents living with dementia. One of every four residents in NHs in the US receives antipsychotic medication (CMS, 2021). Researchers have shown non-pharmacological approaches such as music therapy can improve agitation and neuropsychiatric behaviors among residents living with dementia (Ray et al., 2017; McCreedy et al., 2019; Guertin, et al., 2009). The main objectives of this QI project are to reduce behavioral symptoms and use music therapy as a treatment option. Implementation of music therapy in the NH population may have a significant impact on nursing practice in improving care as music therapy is shown to improve mood, decrease aggression and agitation. Use of music therapy in NH settings also have a potential of long-term benefits on preventing and/or reducing risk of falls and related injuries, thus reduce long term care expenditures in the future. There is a need for future DNP projects including a larger sample size and longer duration to study the effect of

music therapy in the reduction of psychotropic medication among nursing home residents living with agitation and aggressive behavior with dementia.

APPENDICES

Appendix A: Investigator-developed behavior monitoring tool

Daily Behavior & Antipsychotic Medication Record

Participant ID _____

Date: ____ / ____ / ____

Week: **Pre-Intv1** **Pre-Intv2** Int1 Int2 Int3 Int4 Int5 Int6

Severity: 1=mild, 2=moderate, 3=severe

	Monday			Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday			Totals
	7-3	3-11	11-7	7-3	3-11	11-7	7-3	3-11	11-7	7-3	3-11	11-7	7-3	3-11	11-7	7-3	3-11	11-7	7-3	3-11	11-7	
AGGRESSIVE BEHAVIOR																						
Frequency																						
Severity																						
AGITATED BEHAVIOR																						
Frequency																						
Severity																						
PRN ANTIPSYCHOTIC MEDICATION ADMINISTRATION																						

Appendix B: Table of Evidence

TABLE OF EVIDENCE

CITATION	PURPOSE	SAMPLE/SETTING	METHODS (Design, Interventions, Measures)	RESULTS	DISCUSSION, INTERPRETATION, LIMITATIONS
<p>Ray, K. D., & Mittelman, M. S. (2017). Music therapy: A non-pharmacological approach to the care of agitation and depressive symptoms for NH residents with dementia. <i>SAGE Journals</i>, 16(6), 689-710. https://doi.org/10.1177/02F147130121561377 2</p>	<p>-To determine if music therapy is helpful in the management of neuropsychiatric behavior related to dementia in elderly (Ray et al., 2017).</p>	<p>-Initially n-330 residents In NH -Diagnosis: Moderate to severe dementia. -Receiving antipsychotic medications. -Common behaviors: Agitation Depression Wandering -Residents were taken from three NH in New York. -180 were ineligible because of Mental Health diagnosis. -Of 150, 132 participated in study (88.7%) -Majority of the participants were female (n= 112, 84.8%) -Elderly (mean, 86.9 years, SD 7.29). Gender Both Female 85% and male 15%. -FAST score -mean, 5.63, SD 1.09 -Depression (n= 71, 53.8%)</p>	<p>- Pre and post design -Informed consents were taken -Baseline behavior assessment: -Rosberg’s Functional Assessment Test (FAST) -The Cornell Scale for Dementia assessment tool for depression screening. -The Algease Wandering Scale for wandering residents. -The Cohen Mansfield Agitation Inventory tool for agitation screening. -Interventions: Two weeks of music therapy as treatment -Repeat assessment Two weeks without music therapy -Music therapy in group (4-6) participants per group) Duration, 15 min to an hour -ANOVAS measure was used to compare baseline score following the</p>	<p>-Baseline: Depression. Mean 8.31 SD 5.06 -Mean value is higher as compared to post intervention for depression. -Post intervention -Mean 5.06, SD 4.33 -p-value <.001 -Mean value is lower than pre-intervention for depression. Baseline Agitation, -Mean 59.11, SD 22.04 Mean value for agitation is higher than post intervention for agitation. -Post Intervention Mean, 49.82</p>	<p>-Study strength was a large sample number. -Findings: -Two weeks of music therapy Agitation: -Significant improvement Depression: Significant improvement -Wandering: Not a significant improvement -Limitations: -Pre & Post design as compared to randomized control Behavior may have not been recorded accurately because it was assessed by a Certified Nursing Assistant.</p>

		<p>- (n= 33, 25.0%) -Agitation (n= 28, 21.2%) Receiving antipsychotic medication living with Alzheimer's vascular and mixed dementia</p>	<p>intervention using IBM SPSS.</p>	<p>SD, 15.71 p-value .002 Mean value for agitation went low after music intervention -Wandering, Baseline -Mean, 47.91, SD 11.80 -After music intervention, mean value did not show significant improvement. -Mean, 52.94) SD 10.39 p-value .043</p>	
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Note: n=number of participants; SD =Standard Deviation; P value= probability; Mean= average

CITATION	PURPOSE	SAMPLE/SETTING	METHODS (Design, Interventions, Measures)	RESULTS	DISCUSSION, INTERPRETATION, LIMITATIONS
<p>McCreedy, E. M., Yang, X., Baier, R. R., Rudolph, L. J., Thomas, K. S., & Mor, V. (2019). Measuring effects of nondrug interventions on behaviors: Music & memory pilot study. <i>The Journal of the American Geriatrics Society</i>, 67(10), 2134-2138. https://doi.org/10.1111/jgs.16069</p>	<p>-To Measure the effects of nondrug Interventions on behaviors associated with dementia</p>	<p>-NH In New York -n=45 residents were identified in the NH. -n=34 residents were exposed to music therapy. -31 residents were alive after the intervention and follow-up data was collected</p>	<p>-Six months pre-intervention and post intervention. -Intervention: Music and Memory an individualized music program. -Measures Observation using Agitation Behavior Mapping Instrument (ABMI) -Staff report using Cohen-Mansfield Agitation Inventory (CMAI) -Minimum Data Set-Aggressive Behavior (MDS) -Wilcoxon signed-ranked were used to compare pre-and-post scores using STATA, SE version 15.</p>	<p>-Direct observation was observed by nursing staff for agitation. (n = 31) -Staff interview (n=34) 34 staff members interviewed Agitation Inventory MDS (study range = 0.7). The numbers indicated in the MDS tool. -Baseline behavior numbers were taken from the ABMI, and CMAI tool. 4.1, SD 3.0 -Follow-up after intervention: 4.4, SD 2.3. -A large number of resident's behaviors were improved. Observation with music (p= <.01)</p>	<p>-Small sample size Music selections were based on resident preference between the age of 16- 26. -Strengths -Growing interest in non-pharmacological approaches, such as music. -Cost effective. Findings -After six months of pilot study. Direct observation indicated a large decrease in behavior was measured when residents were introduced to music. -After interviewing staff, a moderate decrease in behavior was captured</p>

				-A moderate decrease in agitation indicated by staff observation	
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Note: MDS=Minimum Data Set; n=number of participants; SD =Standard Deviation; P value= probability; Mean= average.

CITATION	PURPOSE	SAMPLE/SETTING	METHODS (Design, Interventions, Measures)	RESULTS	DISCUSSION, INTERPRETATION, LIMITATIONS
<p>Sakamoto, M., Ando, H., & Tsutou, A. (2013). Comparing the effects of different individualized music interventions for elderly individuals with severe dementia, <i>International Psychogeriatric</i>, 25(5), 775-785. https://doi.org/10.1017/s1041610212002256</p>	<p>-To introduce passive music therapy to residents living with severe dementia and examined the effect of music therapy in dementia residents.</p>	<p>-39 residents with severe dementia -age 65 and over -Random selection -In NH Three groups -One Control group Two intervention Group</p>	<p>-Passive Music Therapy to Intervention group-1 -Passive Music Therapy with interactive session with music therapists to Intervention Group 2 -No music therapy to control group-spent time with caregiver in the room. 30 minutes music session once a week for 10 weeks. Short-term and long-term effects were measured by RN's and OT's. Instruments: MMSE, Short-term effect measurement: Faces Scale, to assess emotional condition, HR. -Long-term effects: BEHAVE-AD, two weeks before implementation and after 10 weeks, and three weeks after implementation ended. -HR changes were analyzed using ANOVA.</p>	<p>-Control group: n=13 residents, further deterioration in behavior symptoms -Passive group n=13 residents: Improvement in short-term as well as long-term effect. Reduce scores in 5 items on BEHAVE-AD scores. Interactive Music group 13 residents shows improvement in person to person contact and improve cognitive focus.</p>	<p>-Current findings suggest passive and interactive music sessions improves emotional and cognitive function. - Limitations: - Only residents with severe dementia was selected for the study. -Small sample size - Short duration -Only individual music session -Group music session was not studied to compare.</p>

			<p>-HF was analyzed using Kolmogorov-Smirnov test and compare using Wilcoxon.</p> <p>-Data was analyzed using SPSS, version 20.0.</p> <p>-Passive and active group were compared using Whitney U test.</p>		
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Note: NH= nursing home, HR heart rate, RN=Registered, OT occupational therapists, NH nursing home, BEHAVE-AD= The Behavioral Pathology in Alzheimer's disease.

CITATION	PURPOSE	SAMPLE/SETTING	METHODS (Design, Interventions, Measures)	RESULTS	DISCUSSION, INTERPRETATION, LIMITATIONS
<p>King, J.B., Jones, K.G., & Goldberg, E. (2018). Increased functional connectivity after listening to favored music in adults with Alzheimer dementia. <i>The Journal of Prevention of Alzheimer's disease</i>, 6(1), 56-62. https://doi.org/10.14283/jpad.2018.19</p>	<p>To verify if there is an Increased Functional Connectivity after Listening to Favorite Music in Adults with Alzheimer's Dementia</p>	<ul style="list-style-type: none"> -The study was conducted in the clinic setting. -Residents were chosen from NHs. -Total of 22 participants were selected living with Alzheimer's disease. -Average age 71 years -Study was performed in the nursing homes in Spain -Residents living with dementia. 	<ul style="list-style-type: none"> -List of the preferred music was obtained from caregivers. -Personal and meaningful music -Informed consents were obtained -Music was introduced through the I-Pod. -MRI was obtained after music session. -t test statistics were used to compare group means pre and post intervention-using SPM12. 	<ul style="list-style-type: none"> -Post observation through MRI, and staff observation. -Significate improvement in resident's behaviors 	<ul style="list-style-type: none"> Validity & reliability of the study was measured by increased functional activity through MRI. -The limitation of the study was a limited number of samples. -Single image was taken, all parts of the brain were not visualized. -The strength of the study is measuring the results through MRI.

CITATION	PURPOSE	SAMPLE/SETTING	METHODS (Design, Interventions, Measures)	RESULTS	DISCUSSION, INTERPRETA TION, LIMITATIONS
<p>Zafra, M., Garcia, L., Fernandez, M., Martinez, E., & Del- Valle, (2018, January/February). Music intervention with reminiscence theory and reality orientation for elderly people with dementia living in nursing home. <i>Holistic Nursing Practice</i>, 32(1), 43-50. https://doi.org/10.1097/hnp.0000000000000247</p>	<p>-The goal of the study was to connect residents through music to their past. (Zafra, et al., 2018).</p>	<p>-Residents were divided into two groups. -Selection include a history of Alzheimer’s disease, age 65 and over, and ability to communicate. -excluded criteria: CVA, alcohol and drug use, and hearing lost.</p>	<p>-Quasi- experimental design -Mini mental status was performed prior to study. -Questionnaires were completed prior to implementation. -Duration was 8 weeks. -16 music sessions were conducted. -Duration of each session was 45 minutes -First group received music intervention. -Second group received standard care. -Independent t- test was used to compare between two groups and the effectiveness of the treatments. -Depression was measured using Goldberg Depression and Anxiety scale. -Statistical analysis was performed using SPSS version 18.0.</p>	<p>-The result of the study indicated that biweekly musical sessions with reminiscence therapy and reality orientation can reduce the depression symptoms in elderly living with Alzheimer’s -The Goldberg test scores was found significant for depression (P = .01)</p>	<p>-The validity and reliability of the study was measured by the differences between two groups through anxiety and Goldberg depression scale. (p= .82) -The strength of the research was its relevance to the practice. -Low cost. -The limitation of the study was sample size. -Lack of periodic follow-up.</p>

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Note: CVA=Cerebral Vascular Accident; P=probability.

CITATION	PURPOSE	SAMPLE/SETTING	METHODS (Design, Interventions, Measures)	RESULTS	DISCUSSION, INTERPRETATION, LIMITATIONS
<p>Cho, H. (2018). The effects of music therapy singing group on quality of life and affect of persons with dementia: A randomized controlled trial. <i>Frontier in Medicine</i>. 5,279. https://doi.org/10.3389/fmed.2018.00279</p>	<p>-The purpose of the study was to compare the effects of music therapy in residents living with dementia between music therapy-singing group with music listening group and a control-TV group</p>	<p>-Study was conducted in a single 242 bed Veteran’s NH in New York City. - The inclusion criteria included residents with dementia, between the age of 65 and 100 years, had no hearing loss, and can sit in a chair or wheelchair for an hour. -The exclusive criteria included residents with severe psychiatric illnesses, and expressive language problems.</p>	<p>-Randomized controlled trial. - Pre & post-test. -Participants were divided into three groups. -Two music intervention group & one control. -Music therapy-singing group, -2. Music listening group - 3. Control-TV group. -Participants were assigned randomly. -40-minutes music sessions twice a week for four weeks. -Two measurement tools were utilized: - The Quality of Life-Alzheimer's Disease and the Positive and Negative Affect Schedule. -Results were measured pre and post the 1st, 4th and 8th sessions. -Statistical data was analyzed using SPSS version 22.0, using -ANOVA test was used to identify effects of interventions between groups.</p>	<p>-The music therapy-singing group significantly improve positive scores and decreased negative scores. -The results were measured using questionnaire scale, QOL-AD Prior to first session, and after the last session by conducting interviews -Both Interviews and music sessions were conducted by activity staff.</p>	<p>-Music therapy-singing groups sessions conducted by a music therapist had significant effects than the music medicine-listening group or the TV group. -After fourth session, there was a significant difference between –singing (active) and TV group -Limitation: small sample size - shorter duration -The validity of the study relies on participants self-report as participants were living with different degrees of dementia.</p>

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Note: QOL-AD= Quality of Life- Alzheimer's disease.

CITATION	PURPOSE	SAMPLE/SETTING	METHODS (Design, Interventions, Measures)	RESULTS	DISCUSSION, INTERPRETATION, LIMITATIONS
<p>Guétin, S., Portet, F., & Picot, M., Pommie, C., Messaoudi, M., Djablkir, L., Olsen, A., Cano, M., Lecourt, E., Tochon, J., (2009, July). Effect of music therapy on anxiety and depression in patients with Alzheimer's type dementia: Randomized, controlled study. <i>Karger Journals</i>, 28, 36-46. http://dx.doi.org/10.1159/000229024</p>	<p>To assess the new music therapy techniques for resident with Alzheimer's type dementia who are suffering from anxiety and depression.</p>	<ul style="list-style-type: none"> - n=30 participants Residents were selected randomly -n=15 intervention group (n=15) -n=15 participants control group (n=15) -Residents were selected from NH -Men and Women 70 to 95 years old -Mild to moderate dementia. -All residents receiving an anticholinergic treatment for 6 months. -Residents with Lewy body dementia, stroke, and Parkinson's were excluded 	<ul style="list-style-type: none"> -Single center randomized controlled study -Receptive music therapy to intervention group. Control group in reading session. -Music selected by residents and caregivers. -Music session once a week for 20 minutes. Music was introduced through headphones in individual room. -Concept of relaxation therapy -Day 0 to week 16 Hamilton Scale Anxiety scale tool was used to measure anxiety score. -GDS tool was used for depression screening. -Total duration of the project is 24 months. Each participant was assessed by neuropsychologists from Day 0, week 4, 8, 16, and 24. -Data was analyzed using t-test or Mann-Whitney Nonparametric test. 	<ul style="list-style-type: none"> -The effect of music therapy for depression and anxiety was evaluated using GDS for - depression and Hamilton Scale for anxiety. -Baseline score for both group insignificant Level of anxiety in music group at W16 - The results show the efficacy of music therapy in residents with dementia. Receptive music therapy helps in cognitive stimulation 	<ul style="list-style-type: none"> -Limitation of the study include its variable, music therapy methods, and type of music therapist professional involved. -The impact of music therapy is its neuropsychological effects to the music (Guétin et al., 2009).

			<p>-Qualitative variables were compared using X2 test and fisher's test.</p> <p>-Statistical analysis was performed using SAS version 9.1. Data was analyzed using ANOVA</p>		
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Note: GDS= Geriatric Depression Scale

REFERENCES

- Alexopoulos, G., Abrams, R., Young, R., & Shamoian, C. (1988). Cornell scale for depression in dementia. *ELSEVIER*, 23(3), [https://doi.org/10.1016/0006-3223\(88\)90038-8](https://doi.org/10.1016/0006-3223(88)90038-8)
- Algase, D., Beattie, E., Bogue, E., & Yao, L. (2001). The Algase Wandering Scale: initial psychometrics of a new caregiver reporting tool. *NCBI*, 16 (3), 141-52.
doi: [10.1177/153331750101600301](https://doi.org/10.1177/153331750101600301)
- Auer, S., Reisberg, B. (1997) The GDS/FAST staging system. *NCBI*. 9 (1),167-71.
<https://doi.org/10.1017/s1041610297004869>
- Burke, W., Houston, M., Boust, S., & Roccaforte, W. (1989). Use of the Geriatric Depression Scale in dementia of the Alzheimer type. *NCBI* 37(9), 856-60.
DOI: [10.1111/j.1532-5415.1989.tb02266.x](https://doi.org/10.1111/j.1532-5415.1989.tb02266.x)
- Butts, J.B., & Rich, K.L. (2018). Philosophies and theories for advanced nursing Practice (3rd ed., pp 827-884). Jones and Bartlett Learning.
- Brancatisano, O., Baird, A., & Thompson, W. F. (2019). A ‘Music, Mind and Movement’ program for people with dementia: Initial evidence of improved cognition. *Frontiers in Psychology*, 10, 1435. <https://doi.org/10.3389/fpsyg.2019.01435>
- Centers for Disease Control and Prevention. (2020). *Alzheimer’s disease and healthy aging*. Retrieved December 2, 2020, from [Alzheimer's Disease and Healthy Aging | CDC](https://www.cdc.gov/alzheimers/)
- Centers of Medicare and Medicaid Services. (2021). *National partnership dementia care in nursing homes*. <https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/National-Partnership-to-Improve-Dementia-Care-in-Nursing-Homes>

- Centers of Medicare and Medicaid Services. (2021). Minimum Data Set (MDS) 3.0 Resident Assessment Instrument (RAI). <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/MDS30RAIManual>
- Cho, H. (2018). The effects of music therapy singing group in quality of life and affect of Persons with dementia: A randomized controlled trial. *Frontier in Medicine*, 5, 279. <https://doi.org/10.3389/fmed.2018.00279>
- Chang, Y., Chu, H., & Chen, J. (2015, December). The efficacy of music therapy for people with dementia: A meta-analysis of randomized controlled trials. *Journal of Clinical Nursing*, 24(23-24), <https://doi.org/10.1111/jocn.12976>
- Curkovic M., Curkovic K., Eric AP., Kralik K., & Pivac N. (March, 2016). Psychotropic medications in older adults: a review. (1),13-24. <https://pubmed.ncbi.nlm.nih.gov/26938816/>
- Cohen-Mansfield J., Marx M., & Rosenthal A. (1989). A description of agitation in a NH. *NCBI*, 44 (3), 77-84 <https://doi.org/10.1093/geronj/44.3.m77>
- Fazio, S., Zimmerman, S., Doyle. P., Shubeck, E., Carpenter, M., Corame, P., Klinger, J., Jackson, L., Pace, D., Kallmyer, B., & Pike, J. (November, 2020). What is really needed to provide effective, person-centered care for behavioral expressions of dementia? Guidance from The Alzheimer's Association Dementia Care Provider Roundtable. *Journal of American Medical Directors Association*, 22(11), 1582-1586 <https://doi.org/10.1016/j.jamda.2020.05.017>
- Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. *Journal of psychiatric research*, 12(3), 189–198. [https://doi.org/10.1016/0022-3956\(75\)90026-6](https://doi.org/10.1016/0022-3956(75)90026-6)

- Goldberg, D., Bridges, K., Duncan-Jones, P., & Grayson, G. Detecting anxiety and depression in general medical settings. (1988), *NCBI* 297(6653), 897–899
<https://doi.org/10.1136/bmj.297.6653.897>
- Guetin, S., Portet, F., & Picot, M., Pommie, C., Messaoudi, M., Djablkir, L., Olsen, A., Cano, M., Lecourt, E., Tochon, J., (2009, July). Effect of music therapy on anxiety and depression in patients with Alzheimer’s type dementia: Randomized, controlled study. *Karger Journals*, 28, 36-46. <http://dx.doi.org/10.1159%2F000229024>
- Helmes, E., Csapo, E., Short, J. (1987). Standardization and validation of the Multidimensional Observation Scale for Elderly Subjects (MOSES). *NCBI*, 42 (4), 395-405.
<https://doi.org/10.1093/geronj/42.4.395>
- Hirt, J., Karrer, M., Adlbrecht, L., Saxer, S., Zeller, A. (2021, March). Facilitators and barriers to implement nurse-led interventions in long-term dementia care: a qualitative interview study with Swiss nursing experts and managers. *BMC Geriatrics*, 21(159),
<https://doi.org/10.1186/s12877-021-02120-1>
- Hoe J., Katona, C., Roch, B., & Livingston, G. Use of the QOL-AD for measuring quality of life in people with severe dementia--the LASER-AD study. (2005). *NCBI* 34(2),
<https://doi.org/10.1093/ageing/afi030>
- Kroenke, K., Spitzer, R., Williams, J. (2001). The PHQ-9: validity of a brief depression severity measure. *NCBI*, 16 (9) 606-613. <https://doi.org/10.1046/j.1525-1497.2001.016009606.x>
- King, J. B., Jones, K. G., & Goldberg, E. (2018). Increased functional connectivity after listening to favored music in adults with Alzheimer dementia. *The Journal of Prevention of Alzheimer’s disease* 6(1), 56-62. <https://doi.org/10.14283/jpad.2018>.

Lai, C., The merits and problems of Neuropsychiatric Inventory as an assessment tool in people with dementia and other neurological disorders. (2014). *NCBI* 8(9),1051-61

<https://doi.org/10.2147/cia.s63504>

McCreedy, E. M., Yang, X., Baier, R. R., Rudolph, L.J., Thomas, K. S., & Mor, V. (2019).

Measuring effects of nondrug interventions on behaviors: music & memory pilot study.

The Journal of American Geriatrics Society, 67(10), 2134-2138.

<https://doi.org/10.1111/jgs.16069>

McKinley, S., Coote, K., & Stein-Parbury, J. Development and testing of a Faces Scale for the of anxiety in critically ill patients. (2003), 41(1), 73-79. *JAN*

<https://doi.org/10.1046/j.1365-2648.2003.02508.x>

Mosser, G., & Begun, J. W., (2014). *Understanding teamwork in health care* (1st ed., pp 124-

142). McGraw Hill Education. Petrovsky, D. (2014). Theoretical model for music therapy on older adults with dementia. *Journal of Nursing Doctoral Students Scholarship*, 2, 33-

52. <https://www.researchgate.net/publication/274445548>

Predescu, V., Ciurezu, T., Romila, A., Pirée, S., Ionescu. G., Roman, I., Brasla, N., Florescu, D.,

Damian N: The ‘double-blind’ procedure in study of the anxiolytic effects of the

Preparation Wy 3498 (Oxazepam): evaluation of anxiety states with the Hamilton scale.

Neurol Psihiatr Neurochir.(1969). 14(2), 153–165. *NCBI*.

<https://pubmed.ncbi.nlm.nih.gov/5804686/>

Prince, M., Bryce, R., Albanese, E., Wimo, A., Ribeiro, W., & Ferri, C (2013). The global prevalenc of dementia: a systemic review and metanalysis, 6 (1) *NCBI*

<https://doi.org/10.1016/j.jalz.2012.11.007>

- Ray, K. D., & Mittelman, M. S. (2017). Music therapy: A non-pharmacological approach to the care of agitation and depressive symptoms for nursing home residents with dementia. *SAGE Journals*, 16(6), 689-710. <https://doi.org/10.1177%2F1471301215613779>
- Ray, K. D., & Götell, E. (2018). The use of music and music therapy in ameliorating depression symptoms and improving well-being in nursing home with dementia. *Frontier in Medicine*, 5(287), 1-6. <https://doi.org/10.3389/fmed.2018.00287>
- Reisberg, B., Monteiro, I., Torossian, C., Auer, S., Shulman, M., Ghimire, S., Boksay, I., F BenArous., Osorio, R., Vengassery, A., Imran, S., Shaker, H., Noor., Naqvi, N., Kenowsky, S., Xu, J. (2014) The BEHAVE-AD assessment system: A perspective, a commentary on new findings, and a historical review. *KARGER*, 38(89) 146. <https://doi.org/10.1159/000357839>
- Sakamoto, M., Ando, H., & Tsutou, A. (2013). Comparing the effects of different individualized music interventions for elderly individuals with severe dementia. *International Psychogeriatric*, 25(5), 775-785. <https://doi.org/10.1017/s1041610212002256>
- Vasionyte, I., & Madison, G., (2013). Musical intervention for patients with dementia: A meta-analysis. *Journal of Clinical Nursing*, 22(9), 1203-1206. <https://doi.org/10.1111/jocn.12166>
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063–1070. <https://doi.org/10.1037/0022-3514.54.6.1063>

Zafra, M., Garcia, L., Fernandez, M., Martinez, E., & Gonzalez, M.T. (2018).

Music intervention with reminiscence theory and reality orientation for elderly people with dementia living in nursing home. *Holistic Nursing Practice*, 32(1), 43-50.

<https://doi.org/10.1097/hnp.0000000000000247>

Zaccagnini, M., & Pechacek, J. M. (2019). *The Doctor of Nursing Practice essentials* (4th ed., pp 217-150). Jones & Bartlett Learning.