Chapter 16

Caring for Individuals with Dementia on a Continuum: An Interdisciplinary Approach Between Music Therapy and Nursing

Kendra Ray, Ayelet Dassa, Jan Maier,
Renita Davis and Olayinka Ogunlade

Additional information is available at the end of the chapter

http://dx.doi.org/10.5772/00000

Abstract

Background: Music has long been used to ease symptoms of dementia. Several studies have shown the therapeutic benefits of music therapy to decrease symptoms of agitation in people with dementia (PWD). Other research has demonstrated that the use of music during caregiving can ease agitated behaviors. However, few studies have shown the clinical benefits of using translational research in practice between music therapists and certified nursing assistants.

Introduction: We recruited 28 nursing home residents who were diagnosed with moderate to severe dementia to determine the effects of music therapy and music in aid of caregiving on symptoms of agitation.

Methods: Participants were evaluated for agitation, then baseline assessments were completed 2 weeks apart. After the 2-week music therapy intervention, participants were evaluated immediately, 2 weeks post music therapy, and immediately following music in aid of caregiving.

Results: A repeated measures analysis of variance (ANOVA) found that after 2 weeks of music therapy, agitation was significantly reduced and symptoms continued to decline following music in aid of caregiving.

Conclusion: Results suggest that consideration for interdisciplinary use of music therapy and music in aid of caregiving should be considered to reduce and sustain symptoms of agitation in nursing home residents with dementia.

Keywords: dementia, caregiving, Alzheimer's disease, nursing, nonpharmacological, music therapy, interdisciplinary, agitation, music, brain, neuroscience

1. Introduction

Caring for people with dementia (PWD) has become a focal point of policy makers, researchers, and healthcare providers. With over 30 million people globally and five million people in the USA diagnosed with Alzheimer's disease and other types of dementia, the need for capable and effective caregiving is necessary [1]. Music therapy has been shown to decrease neuropsychiatric symptoms of dementia [2]. It is well known that music serves as a positive nonpharmacological intervention, and when used therapeutically has the effect to reduce agitation in people who are diagnosed with dementia [3].

Caregiver burden in nursing professionals who work in long-term care facilities is often associated with compassion fatigue, burnout, moral, and psychological distress [4–6]. Music therapists are equipped with therapeutic tools that may assist in making caregiving tasks easier. Research has shown that both music therapy and caregiver-initiated music-based interventions can reduce agitation in people with dementia [7–10]. Singing and rhythm-based interventions are two examples of therapeutic techniques that may be initiated to aid in triggering a memory, changing a mood, or moving toward a desired behavior. Paid caregivers, such as nursing professionals, may be able to assist people with dementia even without any musical skills or background.

The aims of this chapter are to provide evidence of the effectiveness of a music therapy intervention used to lower agitation symptoms in nursing home residents with moderate to severe dementia. We give examples of music in aid of caregiving that may help sustain or further reduce symptoms of agitation. We hope that this chapter may be used as a resource for practitioners and paid caregivers to broaden the scope of how music may be used collaboratively in institutional settings such as nursing homes, hospitals, and hospices.

2. Literature review

2.1. Music therapy and neurological disorders

The use of music therapy in treating mental and neurological disorders is on the rise. Over the past 60 years, music therapy has developed as a clinically applied treatment in various healthcare settings administered by trained professionals who have completed an approved music therapy program.

Bonde et al. [11] explained that the process of defining music therapy both as a profession and as a discipline can vary depending on the orientation and perspective of a particular group of practitioners, or different cultures. However, the process of defining music therapy can be reflected in the way the profession itself has emerged in different countries and through various traditions. In this way, one has to take into consideration three main factors: professional background of practitioners, needs of the clients, and approach used in treatment. Music therapy can be defined as a three-dimensional therapeutic interaction between a trained music therapist, the music, and a patient who meet to reach defined goals and objectives.

http://dx.doi.org/10.5772/00000

Alzheimer's disease and other types of dementia are among the disorders most commonly treated with music therapy [12]. Music therapy for individuals with dementia focuses on improved communication, memory, behavioral management, and facilitating interactive relationships with therapists and carers. Music is seen as a tool to achieve those goals, and the outcomes of music sessions are measured either quantitatively [13, 14] or qualitatively [15, 16]. Hence, in both the neuroscience and music therapy models, music is used instrumentally as an isolated material for impacting change.

The research on music therapy with PWD focuses on two main topics. One examines the effect of music therapy on an increase in desirable behaviors such as concentration span and degree of participation in an activity, and the other examines how music therapy affects the reduction of unwanted behaviors such as restlessness, anxiety, and depression [17].

Music has the power to unlock memories, to be a safe place, and offer solace for people with dementia [18]. The greatest challenge, arguably, in unraveling the myriad effects of music on the brain is the sheer complexity and interactivity of neural network stimulation observed in response to music. As early as 1984, case studies and anecdotal reports described people with dementia with severe cognitive deficits who could still play and/or sing with surprising skill [13, 19–21]. This led to the development of the preservation theory—that areas of the brain involved in the recall of music memories may be preserved from the progression of the disease. Using functional magnetic resonance imagings (fMRIs) in 2009, Janata [22] suggested a role of the dorsal medial prefrontal cortex, which is slower to atrophy in Alzheimer's disease, in connection with emotionally salient long-term memories. In a more recent study, researchers used fMRIs to identify specific brain regions where musical long-term memories seemed to be stored (in the caudal anterior cingulate and the ventral pre-supplemental motor area) in healthy adults. They then contrasted scans of these same regions of healthy older adult controls with people with mild-moderate Alzheimer's disease. The results strongly support the preservation of these regions in people with Alzheimer's disease [23]. This access allows music therapists to connect with PWD where other potential treatments may fail.

2.2. Using music therapy to address agitation with PWD

Neuropsychiatric symptoms, such as agitation, in dementia have been estimated to be between 80 and 90%, and more than 80% of these symptoms persist for at least 18 months [24]. In nursing homes, agitation may be prevalent in up to 20% of individuals diagnosed with dementia [25]. Agitation may interfere with the nursing staff's ability to provide care as it is one of the most difficult symptoms to manage [26].

Many studies have shown that music therapy should be considered as treatment for individuals with dementia who exhibit signs and symptoms of agitation [10, 27–29]. In a systematic review, Livingston et al. (2014) analyzed 33 randomized controlled trials and found that music therapy along with other types of nonpharmacological interventions decreases overall agitation [30]. In their randomized controlled trial, Ridder et al.'s [31] results showed that after 6 weeks of music therapy, agitation in individuals with dementia was significantly reduced, while in the control group agitation increased. Other authors [32] found similar results for nursing home residents with dementia who received music therapy for 6 weeks. In comparison

with the control group, agitation was significantly reduced following music therapy and results were sustained for 1 month after the music therapy intervention.

2.3. Daily care for PWD

With the rising number of individuals diagnosed with dementia accompanied by neuropsychiatric symptoms such as agitation, the need for capable care staff is imminent. Nursing professionals are challenged with the difficulty of tasks associated with caregiving and the behaviors that often accompany a diagnosis of dementia. PWD experience problems with activities of daily living including bathing, dressing, and eventually decision making, which for over 60% of people with dementia leads to institutionalization for assistance with care [33].

Caregiver burden in nursing home staff who work in long-term care facilities is often associated with compassion fatigue, burnout, moral, and psychological distress. These caregivers may be at risk of burnout between 5 and 37% of the time. Outcomes from a focus group performed concluded that nurses who care for people with dementia want to alleviate their suffering and improve their quality of life and may feel strained due to inadequate resources for caregiving [34]. Two other studies indicated an increasing prevalence in psychological distress in care staff who work in nursing homes for people with dementia [5, 6].

2.4. The use of music by care staff

Music medicine involves passive listening of music (usually recorded) that is provided by a medical practitioner or a paid caregiver. The music used during the interaction may or may not be selected based either on the subject's musical preference. Music medicine or music in aid of caregiving (as referred to in this chapter) is different from music therapy in that there is no attempt to develop a therapeutic relationship and the interaction does not involve psychological processes [35].

A review of nonpharmacological interventions among PWD over the past two decades found that music can decrease resistance to treatment and care [3, 29]. Music helps to reduce symptoms of anxiety during activities that pose difficulties. Several studies have documented the effectiveness of the use of music by care staff for people with dementia. One study found that nursing personnel who used singing had a positive effect on the individuals with dementia, including improved posture, increased awareness of self and surroundings, motivation, and skills to perform daily tasks. The care staff who sang with residents benefited by developing mutuality and increased interactions more than those who only played background music [36, 37]. PWD showed better cooperation and fewer behaviors exhibiting resistance to care when singing and recorded music were used, compared to these activities without the use of music [36]. Other benefits that caregiver singing appeared to influence was communication, decreased levels of aggression, and disruptive screaming [36]. Gerdner [38] has created evidence-based guidelines for paid caregivers to use individualized music for people with dementia. Her techniques are often used by professional caregivers to lessen symptoms of agitation in people with dementia. Hammar et al. (2011) performed a study using a technique called Music Therapeutic Caregiving (MTC). The author compared patterns of

http://dx.doi.org/10.5772/00000

behavior in participants whose caregiver used the MTC with patterns of behavior of participants whose caregiver performed care as usual [39]. She found that the caregivers who did not use the MTC experienced more episodes of aggression and resistance from their care recipients than those who did not. In other studies using MTC, this author reported that caregivers described a feeling of well-being, happy, and positive interactions with the person who they were caring for. The individuals with dementia demonstrated increased positive emotions and expressed pleasure and appeared more alert due to the MTC [39].

Nursing professionals who sing and play background music can have positive effects on people with dementia. Results from a randomized controlled trial found that regularly listening to music and singing familiar songs can benefit people with dementia cognitively, emotionally, and socially. In this study, researchers found that these musical activities led by the nurses, family caregivers, choral leaders, and music therapists helped to reduce psychological burden and that singing and listening to music can have positive effects for up to 6 months for people with early dementia [40].

Other researchers have described qualitatively and quantitatively how music can help to reduce agitation during caregiving [37, 41–43]. A review article found that carers for people with dementia played a significant role in decreasing agitation and in the work of music therapy for elders with dementia in nursing homes [44]. Choi et al. [45] found that music therapy was useful in not only reducing agitation in residents with dementia but also reducing irritability, distress, and anxiety in their caregivers. Numerous studies reported that caregivers who used a tape player or a CD player were effective in reducing agitation in clients diagnosed with dementia [46–48]. Using music during caregiving taps into memories, stimulates emotions, inspires, rewards engagement, and has an effect on individuals with dementia like no other treatment [49].

2.4.1. Training program for care staff: utilizing music in daily care

Since music is an accessible tool that is a part of most people's day-to-day life, main elements (recorded music, singing, and rhythm) can be used by music therapists to instruct and make it possible for care staff, even those without any musical experience, to employ it in their work with PWD. Minimizing restlessness is significant and contributes to the person with dementia's quality of life, and also improves the caregiver's ability to give optimal and safe care. Music's positive effect renders it useful for relaxation and for softening resistance, and thus alleviating the day-to-day life of the caregiver and the person with dementia.

2.5. Elements of music: Background music, singing, and rhythm

The various musical activities that can be used in a training program for caregivers serve as a therapeutic tool with an optimum impact. Following is a review of the literature addressing each of these musical tools in working with people with dementia.

2.5.1. The effect of background music

Studies examining musical interventions among PWD indicate that individually or culturally matched music significantly increases the music's positive effect on the person. Individually matched music was found to be the best and most effective way to reduce restlessness among Alzheimer's patients [48, 50]. The effect of culturally matched background music on the degree of the patients' restlessness was examined among the residents of a retirement home [51]. While listening to music, a marked reduction in restlessness characteristics was observed, such as less shouting, repetitive requests for attention, and so forth. Also, positive behaviors such as singing, drumming/tapping to the rhythm of the music, smiling, and others were observed. On the other hand, when music was not heard, the number of problematic behaviors increased and the number of positive behaviors decreased [51].

2.5.2. The effect of singing

Singing has a central place in music therapy with PWD. The literature shows that despite their memory loss, these patients continue to sing old songs, which remain intact in their memory for longer than songs learned at a later stage in their lives. Episodic/explicit memory for songs is not only for the melody and lyrics but also for the world of associations and personal memories that the songs evoke. In practice, the songs work like a stimulus to evoke multitude memories associated with the song [22, 52–54]. The songs stimulate and encourage conversation associated with the topic of the song. Music therapy groups that focus on singing have led to an improvement in the patients' conversational capabilities and to a lively discussion about the experience of singing in the group [55]. Singing thus provides PWD with a feeling of social belonging. Singing is comforting in that it is a familiar activity, whereas cognitive activity arouses difficulty and frustration. Singing provides respites of stimulation, awareness, a pleasant feeling, and an experience of success [52]. The feeling of success is important among PWD encountering difficulty and poor functioning, which generally lead to a damaged sense of self-worth and depression. A music therapy group that focuses on singing and evoking memories can alleviate the symptoms of depression among PWD [56]. Singing can also reduce the degree of restlessness among PWD. A decrease in problematic behavior stemming from restlessness is evident during participation in a singing-focused music therapy group [57].

2.5.3. The effect of rhythm

Rhythm has an effect on the movement system. The body reacts automatically to rhythmic musical stimulus. Even when the listener is not moving, rhythm stimulates activity in the premotor cortex as if priming the body for movement [2, 58–60]. Movement to music is a common phenomenon across cultures, and moving in time with the beat (entrainment) appears to be pleasurable [61–64]. Toe tapping, head nodding, and dance involve perception of rhythm and the beat, which can enable synchrony among individuals, whether playing, singing, or moving.

Music helps to boost physical activity and it also has a calming effect. A group of 18 participants with dementia who took part in exercise sessions with background music showed a reduction

http://dx.doi.org/10.5772/00000

in restlessness signs after 4 weeks of activity (twice a week), compared to a group of 18 patients who did not receive the intervention, but only "regular treatment"[50].

Even though many studies have investigated the effectiveness of using music therapy and music-based activities for people with dementia, there lacks evidence of a study that describes collaborative efforts between music therapy and nursing for nursing home residents with dementia. This study was intended to examine whether music therapy could reduce agitation in nursing home residents with moderate to severe dementia and if the reduction in agitation could be sustained or further reduced through the facilitation of music to aid in caregiving by Certified Nursing Assistants (CNAs).

3. Methods

3.1. Participants

3.1.1. Certified nursing assistants (CNAs)

At MJHS, certified nursing assistants (CNAs) are responsible for providing direct care to nursing home residents. Their duties include but are not limited to dressing, feeding, toileting, bathing, and other activities of daily living. CNAs have the most frequent and most intimate contact with nursing home residents. They report directly to unit nurse supervisors and the director of nursing who oversee their assignments and duties. At the time of the study, two CNAs reported singing with residents but for pleasure instead of with the desire to decrease or alleviate agitation. Only one of the CNAs had a history of formal musical training prior to this study. Previously, she was employed as a school teacher, but had not used music during her caregiving. For this study, there were eight CNAs recruited at the Menorah Center for Nursing and Rehabilitation, six at Metropolitan Jewish Geriatric Center, and 10 at Shorefront Center for Nursing and Rehabilitation. The majority of the CNAs were Black Caribbean American, followed by Latino and Russian. All were female, aged between 35 and 60 and reported to have five or more years of experience working with nursing home residents diagnosed with dementia.

3.1.2. CNA training

The CNAs participated in a 3-day intensive training course. The purpose of the training was to educate CNAs to facilitate music in aid of caregiving activities appropriate for the participants that they provided care. Topics in the training included foundations of music, recognizing and identifying agitation, working with an iPod for music in aid of caregiving, selecting person-preferred music and music that may influence participant behavior, and preventing agitation through the use of recorded music with six protocols that are described below. CNAs were tested on music in aid of caregiving facilitation and on their ability to use an iPod in a mock-group setting at the end of the training. Video recordings of the CNAs' use of music in aid of caregiving with participants were used for training purposes as a reflective process with the music therapist and to determine if additional education was needed.

CNAs were assigned an iPod mini that was attached to their uniform. The iPod was loaded with personalized playlists created by the research music therapist. The CNAs were also given portable speakers that could be easily stored in their pockets until ready for use. Selections for each song in the playlists were created based on individualized preference and the success of observed reductions of agitation during music therapy groups. The music therapists created other general playlists that were loaded onto the iPod. These were meant to stimulate, relax, or prompt caregiving activities depending on the need of the resident. Some examples of the types of playlists included the following: sing-a-long, Russian classical, music-assisted bathing, energizing, Caribbean, etc., **Figure 1**. As needed, the music therapists created playlists for CNAs to use with residents when they were engaged in activities that triggered agitation such as bath/shower time [42].

Sing-a-long Playlist (24 minutes)	
Song-Artist	Album
Side by Side Kate Smith	I'll Be Seeing You
You Are My Sunshine Rosemary Clooney	Learnin' the Blues
Hava Nagilah The Moshe Silberstein Ensemble and Chorus	The Music of Israel
Tumbalalaika Theodore Bikel	Yiddish Folk and Theatre
Quizas, Quizas, Quizas Celia Cruz	Cuba Bella
Michael Row the Boat Ashore Peter, Paul and Mary	Sing Along
Red River Valley Frank Corrales and Cisco Trio	Sing Along
Tzenah Tzenah The Neshoma Orchestra	Jewish Play Along
God Bless America Kate Smith	The Best of Kate Smith

Figure 1. Sample sing-a-long playlist. Source: Kendra Ray, Michael McGaughy, Scott Stuart, *Music Therapy: Keys to dementia care* (New York, MJHS) 34. Print [65].

There were six music in aid of caregiving protocols written by the research music therapists and used by the CNAs in this study. A detailed description of each of these protocols can be

http://dx.doi.org/10.5772/00000

found online at https://issuu.com/mjhs/docs/2013_dementia_workbook_lr_fnl_upt. All protocols used participants' individually preferred music based on a music therapy assessment and were created specifically for the nursing home residents who participated in this study. The developed protocols were singing, music and movement, music-assisted bath/shower, music-assisted wound care, music-assisted range of motion, and tonal protocol. A variety were created in order for the CNA to have a selection to choose from that would fit most appropriately when addressing agitation. Each protocol lists the following criteria to be considered before use: staff requirements, objectives, entrance and exit criteria, duration, safety considerations, facility/equipment required, and methods for facilitation.

Singing protocol uses live and/or recorded background music to facilitate a meaningful opportunity and to prevent or reduce verbal and/or physical agitation during activities of daily living. Music playlists or CNA lead singing should be used while providing care. Communication and singing are emphasized in this protocol.

Music and movement uses background music to engage residents to decrease symptoms of agitation, such as unexplained motor activity or verbalizations, until they decrease or are diminished. For this protocol, CNAs are asked to lead movements using sensory-stimulating items such as scarves or ribbons. Pre-recorded playlists were provided that stimulate slow to moderate movement.

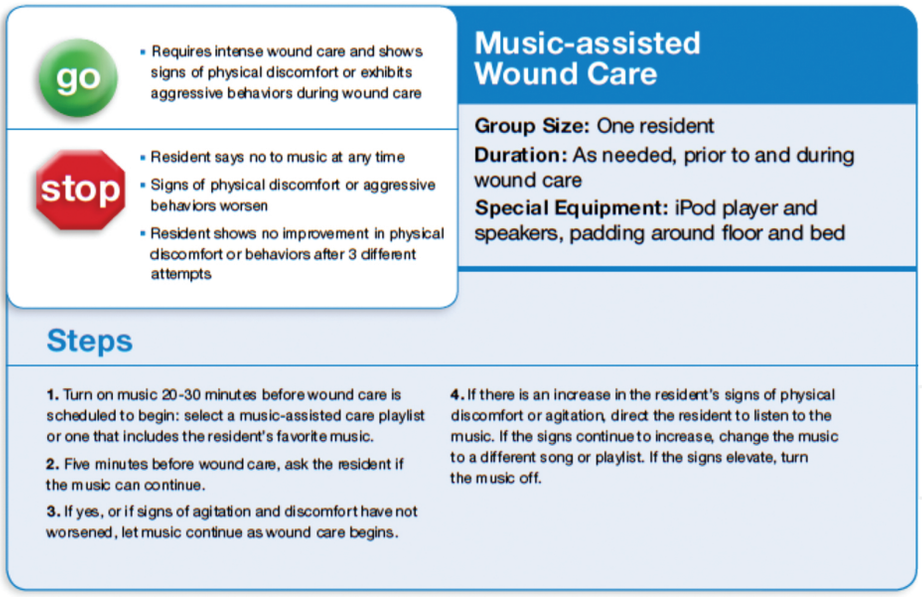

Figure 2. Abbreviated version of music-assisted wound care provided for CNAs and nursing staff. Source: Kendra Ray, Michael McGaughy, Scott Stuart, *Music Therapy: Keys to dementia care* (New York, MJHS) 70. Print [65].

Music-assisted bath/shower uses background music designed to decrease physical tension and aggressive behaviors often associated with bath time for nursing home residents with dementia. CNAs are encouraged to begin music during preparation of the bath/shower to reduce agitation and distract from anticipated stress. The selected music was customized with songs

that have historically relaxed the resident. Communication, listening, and awareness of sensitivity to noise and temperature and other residents' preferences are emphasized.

For music-assisted wound care, staff are encouraged to play background music during preparation of wound care to distract the resident from anticipated stress or agitated behaviors. The music should continue to be played during and following the procedure to reach desired objectives that may include decreased discomfort, fewer or no aggressive behaviors toward nursing staff and less resistance to wound care. Instructions are demonstrated subsequently (**Figure 2**).

Music-assisted range of motion uses background music to motivate residents' involvement in motion exercises. The objectives are to decrease resistance to movement, and reduce episodes of agitation. CNAs are provided with songs of measured tempos that begin slowly and gradually increase in beats per minute as the playlist develops. Rhythm and movement are emphasized in this activity.

The tonal protocol is a music-based activity with an objective of reducing agitation and increasing socialization. Residents are encouraged to sing familiar songs and play tone bars as led by the CNA. Rhythm and movement are emphasized in this activity.

3.1.3. Residents

The CNAs and music therapists worked with a total of 28 adults between the ages of 59 and 101 whom assented to participate in this study. Legal representatives were contacted to obtain informed consent and video consent for each individual. This was part of a larger study [10] that was conducted in three Brooklyn-based nursing homes, part of the MJHS system, Menorah Center for Nursing and Rehabilitation, the former Shorefront Center for Nursing and Rehabilitation, and Metropolitan Jewish Geriatric Center. The New York University School of Medicine Institutional Review Board approved the protocol for this study.

Inclusion criteria required for participants to be long-term residents in the nursing home, informed consent from caregiver or legal guardian, mid-stage dementia as measured by Functional Assessment Staging for Alzheimer's Disease (FAST), stabilized comorbidities, auditory recognition with or without an assisted device, and absence of psychiatric disorders other than dementia. Participants were excluded if they declined participation, were being introduced to new medications, were admitted for short-term rehabilitation, had unstable comorbidities, or who had hearing loss that was uncorrectable.

Consented participants were mostly female (n = 26, 92.9%). The majority of participants were Caucasian (n = 22, 78.6%) followed by African American (n = 4, 14.3%). Their country of origins varied, but most were born in America (n = 14, 50%). Many of the participants were taking anti-anxiety (n = 4, 14.3%), antipsychotic (n = 6, 21.4%) medications, but the majority was not taking any psychotropic medications (n = 15, 53.6%). Participants had a documented diagnosis of dementia in their medical chart with varying types: mixed (n = 12, 42.9%), Alzheimer's disease (n = 7, 25%), unspecified/other (n = 8, 28.5%).

http://dx.doi.org/10.5772/00000

3.4. Study design

Convenience sampling was used for recruitment. Along with chart review, we received referrals for study participation from therapeutic recreation, social work and nursing departments.

3.4.1. Assessment

The Functional Assessment Staging for Alzheimer's Disease (FAST) was used to measure staging for dementia during screening process [66]. Participants who scored between 5 and 6 on the FAST were considered eligible for participation in this study. To the validity of this study, the tester did not contribute to the intervention and had no prior relationship with study participants.

3.4.2. Outcome measure

The outcome measure of the study was the Cohen-Mansfield Agitation Inventory [67]. This tool consists of 29 agitated behaviors and the score can range from 34 to 128. The Cohen-Mansfield Agitation Inventory has high inter-rater agreement rates for each behavior for nursing home residents [67]. Other researchers found that the test/retest reliability for this tool was moderate to good in nursing home residents (n = 105) who were evaluated for agitation [68].

3.4.3. Music therapy intervention

Participants in this study took part in music therapy three times a week for 2 weeks. The intervention was facilitated by two nationally board-certified music therapists who conducted music therapy assessments prior to the intervention to obtain historical, musical preferences. This information was gathered from the nursing home resident, his/her family member, recreation, or nursing staff members. Music selections for the music therapy sessions were tailored according to participants' individual preferences.

Music therapy was conducted in small groups of four to six participants in a private lounge in the nursing home where the participant lived. Each session lasted from 15 min to an hour depending on the tolerance of the participant. Musical expression was demonstrated through singing, music and movement, and tonal activities. The music therapists encouraged the residents to play a variety of rhythm instruments, djembe drums, and ocean drums. Movement was encouraged through the use of colorful scarves and ribbons. The music therapists used live music for the sessions and were self-accompanied by guitar and electronic keyboard. An in-depth description of the music therapy intervention including the songs chosen and common themes that occurred is described in our previous publication [10].

3.4.4. CNA music programming

Following the music therapy intervention, the music therapists trained CNAs to integrate music in aid of caregiving during their daily routine. The transformation design model was

used to guide the training created for the CNAs [69]. The transformation design model is a framework specifically for music therapy treatment. The treatment design was created to make available scientific outcomes in clinical practice immediately [69]. The treatment design is directed by nonmusical outcomes with consideration for the nursing home residents' music and music activity preference. Steps to this model are illustrated in the following example:

1. *Gather information on nonmusical behavior*

CNA reports that resident gets agitated especially during morning care. The CNA informs the music therapist that the resident becomes agitated as soon as it is time to get dressed. The resident kicks and screams as the CNA attempts to dress her. The resident has been checked for signs and symptoms of pain or distress.

2. *Develop treatment goals and objectives*

Goal: Decrease agitation during morning care

Objectives: Decrease kicking and screaming.

3. *Design functional nonmusical activities*

Set a relaxing, musical environment for morning care activities.

4. *Design music activities*

Music therapist visits resident's room prior to morning care and sings resident's favorite songs with her. CNA joins in singing and initiates morning care and dressing resident. Music therapist exits when appropriate.

5. *Transfer outcomes to everyday setting*

Therapist creates a protocol for CNA to use that includes playing familiar music and singing lyrics of resident's favorite songs while dressing during morning care. Music therapist creates playlist on an iPod or a CD player of resident's preferred music based on positive outcomes observed during music therapy. Music therapist instructs CNA with resident's musical preferences to use with resident during morning care [69].

3.4.5. Analysis

IBM Statistical Package for Social Science (SPSS) Statistics software (version 21) was used to obtain frequencies, percentages, means and standard error, and confidence intervals for demographic information and repeated measures ANOVA analysis related to study participants.

A repeated measures ANOVA was conducted to analyze changes in Cohen-Mansfield Agitation Inventory scores for multiple data points. IBM SPSS Statistics software was used to perform the analysis. This method of analysis was chosen since each participant served as her/his own control and it enabled us to compare changes in agitation between multiple data points

http://dx.doi.org/10.5772/00000

over time including the following: baseline 1 and baseline 2; baseline 1 and immediately following music therapy; after music therapy and 2 weeks post music therapy; immediately following music therapy and CNA facilitated music in aid of caregiving. This procedure helped to determine any changes in agitation that occurred during care as usual (between baseline 1 and baseline 2), following the music therapy intervention and following the CNA-initiated music activities.

4. Results

The goal of this study was to determine if music therapy could reduce agitation symptoms and if these changes could be sustained by music in aid of caregiving. A repeated measures ANOVA found that Cohen-Mansfield Agitation Inventory scores differed significantly between the various time points. The assumption of sphericity was met according to Mauchly's test of sphericity, x^2 (9) = 14.81, p = 0.097. Mauchly's test of sphericity demonstrated that the average agitation scores were significantly different between time frames F (4, 92) = 7.03, p < 0.001, and that these changes can be seen visibly on a graph, **Table 1**, **Figure 3**.

Comparisons	Mean score difference	Standard error	95% CI	
			Lower bound	Upper bound
Baseline 1 vs Baseline 2	−3.33	3.77	−15.04	8.37
Post music therapy vs Baseline 1	−11.42*	2.86	−20.28	−2.55
2 weeks post music therapy vs post music therapy	1.71	2.70	−6.67	10.09
CNA MAC vs Baseline 1	−16.67*	4.03	−29.18	−4.15
CNA MAC vs post music therapy	−5.25	4.49	−19.19	8.69

*p < 0.05

Table 1. Bonferroni comparison of agitation scores at various time points.

Post hoc tests were performed using the Bonferroni adjustment for multiple comparisons. The results revealed that between first and second baseline, when participants were receiving care as usual, there were no significant differences in agitation scores (60.87 ± 23.00 vs 57.54 ± 24.17, p = 1.0). When post-music therapy scores were compared to baseline 1 scores, there was a significant difference in agitation (60.87 ± 23.00 vs 49.46 ± 21.92, p = 0.006) indicating that music therapy significantly contributed to reduced agitation. We measured agitation scores again 2 weeks post music therapy and found that there was a slight, but insignificant increase in agitation (49.46 ± 21.92 vs 51.17 ± 16.33, p = 0.189). The agitation scores declined again following CNA-initiated music in aid of caregiving activities (49.46 ± 15.25 vs 44.21 ± 15.25, p = 0.605), although these changes were not significant. The participants' agitation after music in aid of caregiving was significantly lower than the initial baseline scores (44.21 ± 15.25 vs 60.87 ± 23.00,

$p = 0.004$). These results suggest that routine care did not significantly affect agitation, but music therapy significantly decreased agitation symptoms. The effects of the music therapy intervention were not sustainable for 2 weeks post music therapy, but agitation declined again after music in aid of caregiving.

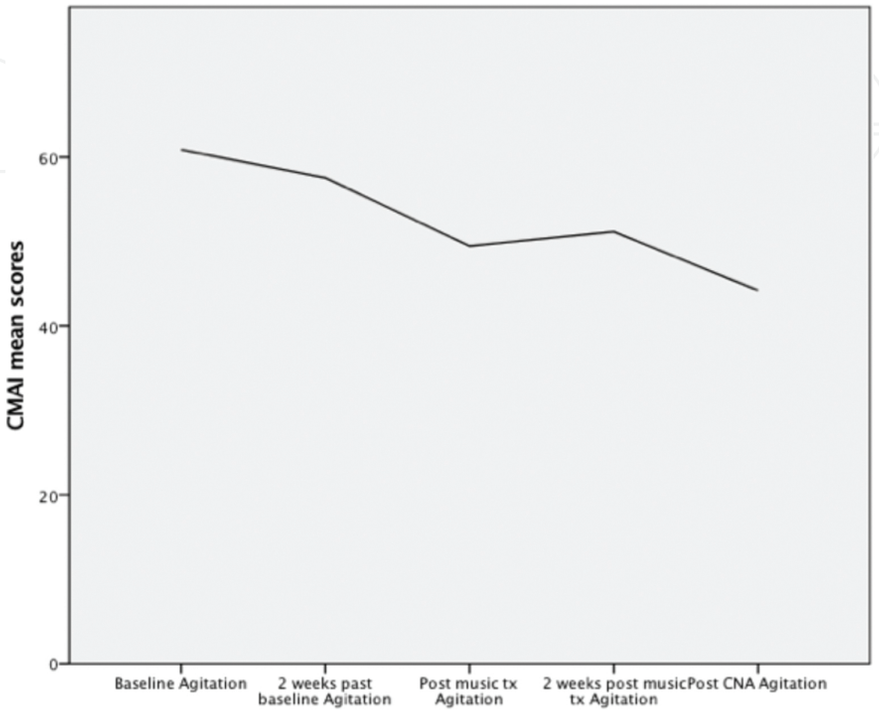

Figure 3. Changes in Cohen-Mansfield agitation scores over time.

5. Discussion and conclusion

Music therapy has been recommended as a nonpharmacological intervention to reduce behavioral symptoms related to dementia such as agitation [3, 29], though there is little research documenting the use of music as an interdisciplinary method between music therapists and nursing professionals. In the current study, we hypothesized that music therapy would reduce symptoms of agitation and that music in aid of caregiving facilitated by educated CNAs would sustain those results. We found that when compared to usual care, music therapy reduced agitation significantly, but following music therapy symptoms began to rise again slightly. When nursing home residents were introduced to music in aid of caregiving by the CNAs, agitation began to decline again. This evidence supports the initiative of researchers that nonpharmacological treatments such as music should be used to manage symptoms of agitation in PWD [70]. Because the majority of residents were taking medications to cope with agitation symptoms, our outcomes also suggest that music therapy followed by music in aid of caregiving should be considered as an interdisciplinary, yet complimentary treatment alongside pharmaceutical therapy.

http://dx.doi.org/10.5772/00000

Prior to the intervention, we observed that many of our residents exhibited symptoms of agitation that included spitting on staff members, cursing, and yelling. These behaviors led to CNAs spending much of their time trying to redirect and console residents using techniques that were often ineffective. The reduction of agitation scores that occurred following the music in aid of caregiving indicates that the education for the CNAs and provision of music-based tools were sufficient.

Our study followed the transformational design which presents the theory that nonmusical behaviors can be changed through the introduction of a music therapy treatment plan [69]. For this study, music therapy followed by CNA education and facilitation of music in aid of caregiving activities led to a decrease in agitation for most of our participants. The plan began with specific goals set by the music therapy researchers who used therapeutic techniques to reduce agitation. Next, music in aid of caregiving or "pleasant (musical) diversions from daily routines or struggles" [52] were used to assist in sustaining the goals set by the music therapists. These protocols (e.g., singing and music-assisted bathing) allowed for CNAs to practice skills that may have been effective during music therapy sessions [52]. From our observations, the results positively affected not only the PWD as evidenced by fewer symptoms but also the CNA who was providing care.

5.1. Conclusion

The tremendous need for nonpharmacological treatment in patients with dementia particularly highlights the importance of making music accessible as a simple and everyday tool that can help in these patients' care. The authors believe that music therapists should challenge this need and that specific training for caregivers at home or in institutions will help ease the burden of care and promote the well-being of both caregivers and people with dementia. Music therapists who work with people with dementia should expand their knowledge and expertise beyond the boundaries of the music therapy room. For that, we must differentiate between music therapy, which is performed by a professional and certified person and the use of music in aid of caregiving done by anyone who cares for people with dementia without the need for any musical background or skill. By promoting training programs in institution settings and at home, we can provide better care for those who need it.

A larger study is needed to test the effects of our intervention and provide evidence of its usefulness. We would like to propose that music in aid of caregiving is not only useful in nursing situations with CNAs but also may be beneficial for all nursing professionals to use to reduce resistance to care while giving medication and for wound care.

Because of the brain's ability to process music even in late stages of dementia [23], it may be beneficial for other healthcare practitioners besides nurses to consider adding music as a tool to aid them in their treatment. Presently, the protocols in this study have been adapted for work with home health aides, family caregivers, occupational and physical therapists, and social workers in multiple types of settings. It is currently being used in the United States, Israel, and Spain. Our future research includes work with a physiotherapist using music to aid with walking. This work will be based on a music therapy technique for patients with neurological problems that make use of rhythm to organize locomotion. Based on previous

research with patients with Alzheimer's in which individuals required assistance with walking and inertia, we will test the rhythmic stimulus that may have a physiological effect and help to organize control over walking. This intervention may also reduce the need for multiple caregivers who assist the patient with walking [71].

In conclusion, the limits for the use of music in aid of caregiving are inexhaustible, but larger samples with more stringent designs are needed to confirm its worthiness. Since music is an accessible tool that is part of most people's day-to-day life, it is possible for even those without musical experience, to employ it in their work with a PWD. Minimizing restlessness is significant and contributes to the person with dementia's quality of life, and also improves caregiver's ability to give optimal and safe care. Music's positive effect renders it useful for relaxation and for softening resistance, and thus alleviating the day-to-day life of the caregiver and the person with dementia.

Author details

Kendra Ray[1,2*], Ayelet Dassa[3,4], Jan Maier[5], Renita Davis[6] and Olayinka Ogunlade[7]

*Address all correspondence to: kray@mjhs.org

1 MJHS, Menorah Center for Nursing and Rehabilitation, Brooklyn, NY, USA

2 Drexel University, Philadelphia, PA, USA

3 Bar-llan University, Ramat Gan, Israel

4 Alzheimer's Medical Center, Ramat Gan, Israel

5 Jemsong, LLC, Waltham, MA, USA

6 Troy University at Phenix City, AL, USA

7 Gemma Regis Center for Music Therapy, Lagos, Nigeria

References

[1] Prince M, Bryce R, Albanese E, Wimo A, Ribeiro W, Ferri CP. The global prevalence of dementia: a systematic review and metaanalysis. Alzheimer's & Dementia: The Journal of the Alzheimer's Association. 2013;9(1):63–75.e2.

[2] Patel AD, Iversen JR. The evolutionary neuroscience of musical beat perception: the action simulation for auditory prediction (ASAP) hypothesis. Frontiers in Systems Neuroscience. 2014;8:57.

[3] Ueda T, Suzukamo Y, Sato M, Izumi S. Effects of music therapy on behavioral and psychological symptoms of dementia: a systematic review and meta-analysis. Ageing Research Reviews. 2013;12(2):628–41.

[4] Albers G, Van den Block L, Stichele RV. The burden of caring for people with dementia at the end of life in nursing homes: a postdeath study among nursing staff. International Journal of Older People Nursing. 2014;9:106–17.

[5] Astrom S, Nilsson M, Norberg A, Winbald B. Empathy, experience of burnout and attitudes towards demented patients amoung nursing staff in geriatric care. Journal of Advanced Nursing. 1990;15:1236–44.

[6] Kuremyr D, Kihlgren M, Norberg A, Astrom S, Karlsson I. Emotional experiences, empathy and burnour among staff carring for demented patients at a collective living unit and a nursing home. Journal of Advanced Nursing. 1994;19:670–9.

[7] Garland K, Beer E, Eppingstall B, O'Connor DW. A comparison of two treatments of agitated behavior in nursing home residents with dementia: simulated family presence and preferred music. The American Journal of Geriatric Psychiatry: Official Journal of the American Association for Geriatric Psychiatry. 2007;15(6):514–21.

[8] Guetin S, Portet F, Picot MC, Pommie C, Messaoudi M, Djabelkir L, et al. Effect of music therapy on anxiety and depression in patients with Alzheimer's type dementia: randomised, controlled study. Dementia and Geriatric Cognitive Disorders. 2009;28(1): 36–46.

[9] Raglio A, Bellelli G, Traficante D, Gianotti M, Ubezio MC, Villani D, et al. Efficacy of music therapy in the treatment of behavioral and psychiatric symptoms of dementia. Alzheimer Disease and Associated Disorders. 2008;22(2):158–62.

[10] Ray KD, Mittelman MS. Music therapy: A nonpharmacological approach to the care of agitation and depressive symptoms for nursing home residents with dementia. Dementia. 2015.

[11] Wigram T, Pedersen N, Bonde LO. A Comprehensive Guide to Music Therapy: Theory, Clinical Practice and Training. London: Jessica Kingsley Publishers, Ltd; 29–35, 2002.

[12] Hara M. Music in dementia care: increased understanding through mixed research methods. Music and Arts in Action. 2011;3(2):34–58.

[13] Cuddy L, Duffin J. Music, memory, and Alzheimer's disease; Is music recognition spared in dementia, and how can it be assessed? Medical Hypotheses. 2005;64(2):229–35.

[14] Vink AC, Bruinsma MS, Scholter RJPM. Music therapy for people with dementia. The Cochrane Collaboration. 2011(4):1–50.

[15] Clair AA. The effect of singing on alert responses in persons with late stage dementia. Journal of Music Therapy. 1996;33:234–47.

[16] Simpson F. Creative music therapy: Last resort? In: Aldridge D, editor. Music Therapy for People with Dementia. London: Jessica Kingsley Publishers; 2000. p. 166–83.

[17] Music therapy in dementia treatment. Presentatoin to the 19th International Symposium on Research in Music Behavior; 2011; Barcelona, Spain.

[18] Clark CN, Warren JD. Music, memory and mechanisms in Alzheimer's disease. Brain: A Journal of Neurology. 2015;138(Pt 8):2122–5.

[19] Beatty WW, Winn P, Adams EW, Wilson DA, Prince JR, et al. Preserved cognitive skills in dementia of the Alzheimer's type. Archives of Neurology. 1994;51:1040–6.

[20] Beatty WW, Zavadil KD, Bailly R, Rixen G, et al. Preserved musical skill in a severely demented patient. International Journal of Clinical Neuropsychology. 1988;10(4):158–64.

[21] Sacks OW. Musicophillia. New York: Alfred A. Knopf; 2007.

[22] Janata P. The neural architecture of music-evoked autobiographical memories. Cerebral cortex (New York, NY: 1991). 2009;19(11):2579–94.

[23] Jacobsen JH, Stelzer J, Fritz TH, Chetelat G, La Joie R, Turner R. Why musical memory can be preserved in advanced Alzheimer's disease. Brain: A Journal of Neurology. 2015;138(Pt 8):2438–50.

[24] Steinberg M, Tschanz JT, Corcoran C, Steffens DC, Norton MC, Lyketsos CG, et al. The persistence of neuropsychiatric symptoms in dementia: the Cache County Study. International Journal of Geriatric Psychiatry. 2004;19(1):19–26.

[25] Morley JE. Dementia-related agitation. Journal of the American Medical Directors Association. 2011;12(9):611–2.e2.

[26] Faull C, Carter YH, Daniels L. Handbook of Palliative Care. MA: Blackwell Publishing; 2005.

[27] Cox E, Nowak M, Buettner P. Managing agitated behavior in people with Alzheimer's disease: the role of live music. The British Journal of Occupational Therapy. 2011;11:517–24.

[28] Raglio A, Bellelli G, Traficante D, Gianotti M, Ubezio MC, Gentile S, et al. Efficacy of music therapy treatment based on cycles of sessions: a randomised controlled trial. Aging & Mental Health. 2010;14(8):900–4.

[29] Patel B, Perera M, Pendleton J, Richman A, Majumdar B. Psychosocial interventions for dementia: from evidence to practice. Advances in Psychiatric Treatment. 2014;20:340–9.

[30] Livingston G, Kelly L, Lewis-Holmes E, Baio G, Morris S, Patel N, et al. Non-pharmacological interventions for agitation in dementia: systematic review of randomised

controlled trials. The British Journal of Psychiatry: The Journal of Mental Science. 2014;205(6):436–42.

[31] Ridder HM, Stige B, Qvale LG, Gold C. Individual music therapy for agitation in dementia: an exploratory randomized controlled trial. Aging & Mental Health. 2013;17(6):667–78.

[32] Lin Y, Chu H, Yang CY, Chen CH, Chen SG, Chang HJ, et al. Effectiveness of group music intervention against agitated behavior in elderly persons with dementia. International Journal of Geriatric Psychiatry. 2011;26(7):670–8.

[33] Rabins PV, Blass DM. In the Clinic. Dementia. Annals of Internal Medicine. 2014;161(3):ITC1; quiz ITC16.

[34] Edberg AK, Bird M, Richards DA, Woods R, Keeley P, Davis-Quarrell V. Strain in nursing care of people with dementia: nurses' experience in Australia, Sweden and United Kingdom. Aging & Mental Health. 2008;12(2):236–43.

[35] Dileo C. Effects of music and music therapy on medical patients: a meta-analysis of the research and implications for the future. Journal of the Society for Integrative Oncology. 2006;4(2):67–70.

[36] Gotell E, Brown S, Ekman SL. Influence of caregiver singing and background music on posture, movement, and sensory awareness in dementia care. International Psychogeriatrics/IPA. 2003;15(4):411–30.

[37] Gotell E, Brown S, Ekman SL. Caregiver singing and background music in dementia care. Western Journal of Nursing Research. 2002;24(2):195–216.

[38] Gerdner LA. Consumer version of evidence-based guidelines: Individualized music for elders with dementia. In: Titler M, editor. Series on Evidence-Based Practice for Older Adults. Iowa City, IA: The University of Iowa College of Nursing Gerontological Nursing Interventions Research Center; Research Dissemination Core; 2007.

[39] Hammar LM. Caregivers' Singing Facilitates Mutual Encounter: Implementation and Evaluation of Music Therapeutic Caregiving in Complex Dementia Care Situations. Karolinska Institute. Stockholm, Sweden; 2011.

[40] Sarkamo T, Tervaniemi M, Laitinen S, Numminen A, Kurki M, Johnson JK, et al. Cognitive, emotional, and social benefits of regular musical activities in early dementia: randomized controlled study. The Gerontologist. 2014;54(4):634-50 doi:10.1093/geront/gnt100.

[41] Hoeffer B, Talerico KA, Rasin J, Mitchell CM, Stewart BJ, McKenzie D, et al. Assisting cognitively impaired nursing home residents with bathing: effects of two bathing interventions on caregiving. The Gerontologist. 2006;46(4):524–32.

[42] Ray KD, Fitzsimmons S. Music-assisted bathing: making shower time easier for people with dementia. Journal of Gerontological Nursing. 2014;40(2):9–13.

[43] Thomas D, Heltman R, Alexander T. The effects of music on bathing cooperation for residents with dementia. Journal of Music Therapy. 1997;34(4):246–59.

[44] Wall M, Duffy A. The effects of music therapy for older people with dementia. British Journal of Nursing 2010;19(2):108–13.

[45] Choi AN, Lee MS, Cheong KJ, Lee JS. Effects of group music intervention on behavioral and psychological symptoms in patients with dementia: a pilot-controlled trial. The International Journal of Neuroscience. 2009;119(4):471–81.

[46] Cohen-Mansfield J, Werner P. Management of verbally disruptive behaviors in nursing home residents. The Journals of Gerontology Series A, Biological Sciences and Medical Sciences. 1997;52(6):M369–77.

[47] Gerdner LA, Swanson EA. Effects of individualized music on confused and agitated elderly patients. Archives of Psychiatric Nursing. 1993;7(5):284–91.

[48] Gerdner LA. Effects of individualized versus classical "relaxation" music on the frequency of agitation in elderly persons with Alzheimer's disease and related disorders. International Psychogeriatrics/IPA. 2000;12(1):49–65.

[49] Weeks S. Connecting through music with people with dementia: A guide for caregivers. Journal of Mental Health. 2011;20:503.

[50] Sung HC, Chang AM, Lee WL. A preferred music listening intervention to reduce anxiety in older adults with dementia in nursing homes. Journal of Clincal Nursing. 2010;19(7–8):1056–64.

[51] Ziv N, Granot A, Hai S, Dassa A, Haimov I. The effect of background stimulative music on behavior in Alzheimer's patients. Journal of Music Therapy. 2007;44(4):329–43.

[52] Clair AA, Memmott J. Therapeutic Uses of Music with Older Adults. Silver Spring, MD: American Music Therapy Association; 2008.

[53] Tomaino C. The role of music in the rehabilitation of persons with neurologic diseases. Music Therapy Today (online). 2002.

[54] Koelsch S. Music-evoked emotions: principles, brain correlates, and implications for therapy. Annals of the New York Academy of Science 2015;1337:193–201.

[55] Dassa A, Amir D. The role of singing familiar songs in encouraging conversation among people with middle to late stage Alzheimer's disease. Journal of Music Therapy. 2014;51(2):131–53.

[56] Ashida S. The effect of reminiscence music therapy sessions on changes in depressive symptoms in elderly persons with dementia. Journal of Music Therapy. 2000;37(3):170.

[57] Svansdottir HB, Snaedal J. Music therapy in moderate and severe dementia of Alzheimer's type: a case–control study. International Psychogeriatrics/IPA. 2006;18(4):613–21.

[58] Kung SJ, Chen JL, Zatorre RJ, Penhune VB. Interacting cortical and basal ganglia networks underlying finding and tapping to the musical beat. Journal of Cognitive Neuroscience. 2013;25(3):401–20.

[59] Grahn JA, Brett M. Rhythm and beat perception in motor areas of the brain. Journal of Cognitive Neuroscience. 2007;19(5):893–906.

[60] Grahn JA, Rowe JB. Feeling the beat: premotor and striatal interactions in musicians and nonmusicians during beat perception. The Journal of Neuroscience: The Official Journal of the Society for Neuroscience. 2009;29(23):7540–8.

[61] Drake C, Penel A, Bigand E. Tapping in time with mechanically and expressively performed music. Music Perception. 2000;18:1–24.

[62] Nettl B. An ethnomusicologist contemplates universals in musical sound and musical culture. In: Wallin NL, Merker B, Brown S, editors. The Origins of Music. Cambridge, MA: MIT Press; 2000. p. 463–72.

[63] Brown S, Jordania J. Universals in the world's musics. Psychology of Music. 2013;41:229–48.

[64] Zatorre RJ, Salimpoor VN. From perception to pleasure: music and its neural substrates. Proceedings of the National Academy of Sciences of the United States of America. 2013;110(Suppl 2):10430–7.

[65] Ray KD, McGaughy M, Stuart S. Music Therapy: Keys to Dementia Care. New York, NY: MJHS; 2013.

[66] Sclan SG, Reisberg B. Functional assessment staging (FAST) in Alzheimer's disease: reliability, validity, and ordinality. International Psychogeriatrics/IPA. 1992;4(Suppl 1): 55–69.

[67] Cohen-Mansfield J, Marx MS, Rosenthal AS. A description of agitation in a nursing home. Journal of Gerontology: Medical Sciences. 1989;44(3):M77–M84.

[68] Zuidema SU, Buursema AL, Gerritsen MG, Oosterwal KC, Smits MM, Koopmans RT, et al. Assessing neuropsychiatric symptoms in nursing home patients with dementia: reliability and Reliable Change Index of the Neuropsychiatric Inventory and the Cohen-Mansfield Agitation Inventory. International Journal of Geriatric Psychiatry. 2011;26(2):127–34.

[69] Thaut M. Rhythm, Music, And the Brain: Scientific Foundations and Clinical Applications. New York, NY: Taylor & Francis; 2008.

[70] Herrman N, Gauthier S. Diagnosis and treatment of dementia: Management of severe Alzheimer's disease. Canadian Medical Association Journal. 2008;179(12):1279–87.

[71] Clair AA, O'Konski M. The effect of rhythmic audotiry stimulation (RAS) on gait characteristics of cadence, velocity, and stride length in persons with late stage dementia. Journal of Music Therapy. 2006;43(2):154–63.

IntechOpen