

Alzheimers disease and music therapy



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The uses of music to improve the lives of people with dementia and Alzheimer's disease are vast and have been investigated for decades. When reviewing the literature addressing the impact of music and music therapy interventions with dementia patients, many benefits emerge. Individuals decrease problem behaviors, increase social skills, improve emotional and cognitive skills, make gains in maintaining and improving active involvement, and have improved recall and language skills (Brotons, Koger, & Pickett-Cooper, 1997; Koger, Chapin, & Brotons, 1999).

Cognitive, physical, emotional, and social impacts of music for the individual with dementia and their caregivers are discussed in this chapter reviewing the supporting literature base for each topic. The methods of delivering the music stimulus are varied and will be discussed in relation to skill level required for optimal responses from individuals with dementia related disorders. The information synthesized in this chapter provides the rationale for the recommended music interventions outlined in the next chapter.

Knowing how to foster the therapist-client relationship is of importance for any therapist engaged in client interaction. Helping a patient play an instrument or move a scarf during music therapy sessions as well as using gentle touch while singing can improve the development of rapport between client and therapist (Belgrave, 2009). Music therapists are very interested in using the most appropriate music when providing intervention services (Bridges & Prickett, 2000; Groene, 2001). Most individuals prefer hearing music from their young adult years regardless of their age. A recent study however, pointed to a different preference among geriatric clients aged 71-91 years old. Songs such as "Over the Rainbow", "In the Good Ole

Summertime”, “ Let Me Call You Sweetheart”, “ You Are My Sunshine”, and “ By the Light of the Silvery Moon” were preferred for listening (VanWheelden & Cevasco, 2009). While music familiar to individuals can be used as general background music to increase positive social behaviors and decrease negative behaviors related to agitation (Ziv, Granot, Hai, Dassa, & Haimov, 2007), there are many more targeted interventions that have been investigated and indicate benefits for the individual with dementia or Alzheimer’s symptoms and their caregivers.

The literature reviewed in this chapter demonstrates music therapy can be used to:

Decrease agitation- Music therapy techniques can be used to calm patients and families physiologically and behaviorally.

Decrease disruptive behavior- The specific techniques music therapists use to calm and soothe incorporate music familiar to individuals.

Engage in reminiscence- Songs that people have an attachment to are able to assist in recalling events from the past, aiding in caregiver bonding through reminiscing.

Improve functional language- Music sung with words has the unique combination of language and melody. Songs are stored in an area of the brain that is still accessible for individuals who will sing but might not otherwise speak.

Increase mood- Individuals who suffer from depressed mood states can experience increased mood as a result of the emotional connection inherent in music.

Increase socialization- Music can provide structure and support for socialization to occur in a natural environment.

Orient to Reality- Hearing familiar music can increase an individual's ability to engage in the present moment and participate meaningfully with others.

Improve caregiver interactions with their loved ones- Music interactions can provide a positive structured environment for physical and verbal interactions with each other.

Long Term Effects of Music Therapy

Studies with dementia and Alzheimer's patients commonly look at short term responses and behavioral benefits for music interventions. However, long term physiological benefits for weekly music therapy interventions have been found in one study as measured by systolic blood pressure and intelligence assessments (Takahashi, & Matsushita, 2006). During a two year period individuals with moderate to severe dementia participating in weekly music therapy sessions had significantly lower systolic blood pressure and better intelligence scores than individuals in the nonmusic group. These results are encouraging since systolic blood pressure typically increases with age and mental function declines with age for individuals with dementia. Kumar et al. (1999) found melatonin levels were positively affected for male AD patients who participated in 30- to 40-minute morning sessions of music therapy 5 times per week for 4 weeks. Melatonin concentration in serum

increased significantly after music therapy and was found to increase further at 6 weeks follow-up. Increased melatonin levels may explain the relaxed and calm moods shown by the patients in this study.

Maintenance of improvements one month after intervention stopped was found for psychological measurements using the Neuropsychiatry Inventory (NPI). Individuals with dementia participated in 16 weeks of interactive instrumental music therapy sessions and showed significant behavioral and psychiatric symptom improvements compared with individuals not receiving music therapy (Raglio et al., 2008). Delusions, agitation, anxiety, apathy, irritability, aberrant motor activity, and nighttime behavior disturbances were the most improved of symptoms evaluated and might be the result of individuals tolerated higher levels of stimuli before exhibiting disruptive behaviors. As more studies look into the long term effects of music therapy and the ability to maintain gains over time, a clearer picture will begin to emerge about the most appropriate intervention techniques to use for optimal benefits.

Effect of Music on Cognition

Individuals with impaired cognition commonly experience frustration, apathy, lack of engagement with others, emotional outbursts, strained relationships with caregivers, depression, and decreased communication, which can result in a greatly decreased quality of life. Because cognition has such far reaching impacts on behavioral outcomes, the literature base for the effects of music on cognition for individuals with impaired cognition addresses many different outcomes measures including:

Cognitive levels as measured most commonly by the Mini-Mental State Exam (Bruer, Spitznagel, & Cloninger, 2007; Smith, 1986).

Speech content and fluency (Brotons & Koger, 2000).

Information recall (Lord & Garner, 1993; Prickett & Moore, 1991).

Level of engagement in activities (Brotons and Pickett-Cooper, 1994; Cevasco & Grant, 2006; Christie, 1995; Clair, 1996; Clair & Bernstein, 1990; Clair, Mathews, & Kosloski, 2005; Hanson, Gfeller, Woodworth, Swanson, and Garand, 1996; Holmes, Knights, Dean, Hodkinson, & Hopkins, 2006; Sherratt, Thornton, & Hatton, 2004).

Attentional focus ((Belgrave, 2009; Gregory, 2002; Groene, 2001).

Bruer, Spitznagel, and Cloninger (2007) compared music therapy group interventions with movie watching and measured cognitive levels with the Mini-Mental State Exam (MMSE) for individuals with dementia diagnoses. MMSE scores showed improvements by 2.00 points immediately after the music intervention and by 3.69 points when measured the next morning, both of which were significantly greater changes than found in control movie watching conditions. However, by the following week no significant cognitive differences remained between the two groups. In light of other maintenance studies, the frequency of music therapy intervention should be considered. These study participants switched intervention conditions and therefore only participated in music therapy groups twice per month for 2 months.

An individual's speech content and fluency can increase when reminiscing sessions are paired with music as opposed to simply discussing memories

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with only speech (Brotons & Koger, 2000). Other measures used with reminiscing yield different results. Mini Mental Status Exam language scores increased for AD patients participating in both musically cued reminiscing and verbally cued reminiscing sessions, while overall MMSE scores improved only for the music only sessions with no reminiscing (Smith, 1986).

The task of teaching an individual with dementia new information they may need to know is difficult. Pairing new information in a familiar musical context has resulted in greater recall accuracy for the new information for individuals with AD, even over rhymed speech (Prickett & Moore, 1991). Incorporating important information that a person needs to learn into a song may result in higher success for recalling the information than teaching new information in spoken formats.

Attentional Focus and Active Engagement

With the many different components that make up music therapy sessions, it is difficult to identify one specific technique or method that works best at eliciting engagement from clients. Individuals with early to mid stage AD can have differing responses of participation level when presented with different types of activities. Rhythmic activities yielded significantly higher levels of engagement when compared to both movement and singing activities (Cevasco & Grant, 2006). Adding a highly participatory peer to a small group setting can increase the level of participation for the entire group (Christie, 1995). Brotons and Pickett-Cooper (1994) found responses to individuals composing and improvising were significantly lower than playing instruments, movement, dancing, and music games for female residents with probable dementia diagnoses. Providing structured activities in sessions

might be preferred due to its predictability and ease of following instructions without making as many decisions as the music activity progresses.

Attentional focus is aided by the presentation of the music stimulus. Music that is played live and has complex rhythms has been found to keep the attention of dementia patients at much higher rates than live music with simple rhythms, or recorded music with complex or simple rhythms (Groene, 2001). When compared to recorded music and no music conditions, live music is significantly more effective in increasing engagement levels of moderate to severe dementia patients regardless of their cognitive impairment level (Sherratt, Thornton, & Hatton, 2004). Pairing unaccompanied singing with a gentle touch to the arm, shoulder, or hand can increase alert behavior states as well, especially during the initial encounter an individual has with a music therapist (Belgrave, 2009).

The use of live music is further supported through results found from a randomized placebo-controlled trial with blinded observer raters investigating subjects with moderate to severe dementia and diagnosed apathy (Holmes, Knights, Dean, Hodkinson, & Hopkins, 2006). Each subject was randomly assigned to 30-minute live interactive music, pre-recorded music, or silent periods. Muting video recordings were analyzed every 3 minutes using dementia care mapping to assess the quality of engagement to the blinded music intervention. Only 12.5% of subjects showed positive engagement in the silent placebo period. For subjects in pre-recorded music sessions, only 25% showed positive engagement, which was not a significant increase from baseline placebo. However, 69% of subjects showed a significant increase for positive engagement to live music regardless of

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dementia severity. The findings emphasize the immediate effect live music has for apathetic dementia patients at even the most severe level of cognitive impairment.

The evidence supporting live music does not preclude the use of recorded music with dementia patients. Nursing home residents with AD self reported being more alert, happier, and recalled past events more accurately after having “ Big Band” music played during their recreational periods for six months, when compared to AD patients participating in puzzle, drawing, and painting recreation groups for the same six months (Lord & Garner, 1993).

While some individuals with dementia are not able to attentively participate throughout music activities, research indicates that they can increase their successful attentiveness with minimal guidance. Simply putting on background music to increase pleasure or distract from negative behaviors being elicited may work to capture the attention of some clients, but others can benefit from structure and training provided by music therapists or other caregivers (Gregory, 2002).

Much of the literature base for music interventions with dementia and Alzheimer’s disease investigates early to middle, middle, to late stages, or all stages of the disease together instead of specifically looking at one stage of the disease. The lack of studies with late stage dementia is most likely the limited tools available for measuring behavioral changes. With limited to no verbal or written feedback from individuals with end stage dementia, the methods for data collection are few. The following studies related to participation levels will be discussed grouped by the stage of disease progression.

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Many factors impact participation level from individuals with early and middle stage dementia in music therapy sessions. The choice of where to place an instrument during music therapy interventions can affect an individual's participation level. Many times a client may want to hold a drum in their hand and strike it with a mallet. However, when a person can feel the vibrations of an instrument he is more likely to elicit higher participatory responses (Clair & Bernstein, 1990). This can be accomplished by placing a vibrotactile instrument such as a drum with a responsive drum head in a client's lap.

For patients with middle stage dementia, the type of activity within a music therapy session does not always change their participation level within or across sessions. The number of times a person needs a verbal prompt to participate will most likely not change across the types of activities within sessions that include singing, rhythm instrument playing and physical exercise/movement to music (Clair, Mathews, & Kosloski, 2005). Performing initial assessments of participation level and knowing those levels are predicted to remain constant across sessions can be useful for therapists for planning purposes.

Another consideration for group participation is cognitive level within early and middle stages of AD. For individuals at all stages of cognitive functioning, participation is highest when engaged in movement activities according to Hanson, Gfeller, Woodworth, Swanson, and Garand (1996).

When comparing singing with instrument play and movement activities the lowest level of participation is usually seen when individuals are engaged in singing. Modifying the difficulty level of the activity does seem to impact the

engagement level as singing and rhythm activities have greater responses when presented at a lower level of difficulty requiring less input and decision making from patients.

Individuals who have late-stage dementia with no discernable language can elicit discernible purposeful responses to auditory stimulation.

Unaccompanied singing, reading the newspaper, and sitting silently with a patient yield different response rates. Alert responses including vocalizations, opening of eyes, turning one's head to localize sounds, and whole body movements have the highest frequency when listening to unaccompanied singing followed by reading, with the least responses elicited while sitting silently (Clair, 1996).

Effects of Music on Physical Difficulties

Physical issues worsen for dementia patients as the disease progresses.

Discovering ways to increase involvement in physical exercises for individuals who have difficulty maintaining attention and alertness becomes imperative to help patients maintain their strength and flexibility. Increased movement and physical activity can help delay the rigidity and contractures of extremities and joints that sets in towards the end stages of the disease (Reisberg & Frannssen, 1999). Physical wandering from residences and within facilities is a dangerous occurrence that worsens as the disease progresses as well. Several music interventions have shown positive results in eliciting high levels of participation during exercises, increasing cognition through exercise to music, and decreasing night wanderings for patients.

Exercise to Music

Recorded instrumental music designed to match set exercise routines yields high participation rates from individuals with dementia (Mathews, Clair, & Kosloski, 2001). Cueing systems also help increase participation levels for exercise-to-music sessions with early to middle stage dementia patients. Continuous verbal cueing used with easy movement tasks results in high participation levels and is most effective when instrumental music is used, as opposed to music with singing and participants playing instruments while exercising (Cevasco & Grant, 2003). When compared to sing-along music therapy sessions, exercise to music sessions using recorded music yield significantly higher participation results from dementia patients (Groene, Zapchenk, Marble, & Kantar, 1998).

Effects of participating in exercise routines reach beyond the physical benefits. Cognitive scores measured by the Mental State Examination (MMSE) improved significantly for moderate to severe dementia patients participating in daily thirty minute exercise-to-music sessions for three months. Control patients receiving daily conversation sessions showed no significant improvements on MMSE scores (Van de Winckel, Feys, De Weerd, & Dom, 2004).

Wandering

Both music therapy intervention groups and reading sessions can decrease amounts of time spent wandering for AD patients in a residential facility. Amounts of time spent sitting and in close proximity to the group were higher for music interventions than reading sessions for patients receiving individual sessions, suggesting that music might hold individual's attention

for longer periods of time than reading (Groene, 1993). Another combination of treatments that show improvement in reduced nighttime wandering for residents with AD living in a long term care facility are aromatherapy and listening to recorded music (Baker, 2001).

Effects of Music on Emotional Responses

Many individuals with dementia feel isolated over time due to feelings of being disconnected from others when they are unable to communicate effectively or understand what is happening around them. These feelings of isolation can lead to symptoms of depression and apathy. Depressive symptoms of individuals with dementia living in a residential care facility can be reduced over time through participating in reminiscence based music therapy small groups (Ashida, 2000). The inability to expressive feelings and confusion about tasks individuals are requested to perform can also result in outbursts and disruptive behaviors as people become agitated (Reisberg & Frannssen, 1999). At times behaviors can even be aggressive as seen in throwing objects, using abusive language, kicking, and yelling. Reviews of literature on the topic of agitation for patients with dementia suggest that using an individual's preferred music instead of generally selected recorded music elicits the most calming behaviors (Casby & Holm, 1994; Sung & Chang, 2005; Sung, Chang, & Abbey, 2006). Also, the greatest positive responses for promoting arousal and positive socialization appear to be associated with live music as opposed to recorded music (O'Conner, Ames, Gardner, & King, 2008). Having musical training earlier in life, such as playing in an ensemble or having private lessons, does not affect an individual's response to music interventions designed to decrease agitation.

Regardless of musical training, individuals show reduced agitation during the music intervention as well as immediately after the sessions (Brotons & Pickett-Cooper, 1996). Reducing disruptive vocalizations can impact the caregivers positively in addition to increasing the patient's quality of life and is therefore an area of much interest for researchers.

Bath Time Aggression

Bath times commonly are met with disruptive behaviors from individuals with dementia due to the confusion surrounding someone else bathing the individual. Fifteen aggressive behaviors have been identified during bath time including: yelling, abusive language, hitting, verbal resistance, crying, physical resistance, grabbing, pinching, kicking, spitting, wandering, biting, throwing, scratching, and gouging (Clark, Lipe, & Bilbrey, 1998). Using preferred recorded music during bath time can result in an overall decrease in aggressive behaviors displayed, an elevated mood from the patient, and increased cooperation.

Thomas, Heitman, and Alexandar, (1997) used recorded music of individual's preferred songs during bathing for individuals diagnosed with Alzheimer's disorder. To be included in the study, a person had to show resistance to bathing and show an interest in music. Positive results were found for decreasing agitation behaviors during baths. Researchers also noted that participants' quality of life increased and care provider's job satisfaction improved with the addition of music during bath times. This type of study informs clinical practice well by screening the individuals appropriate for referring to music assisted interventions.

Mealtime Agitation

Verbally agitated and physically nonaggressive behaviors are positively affected by recorded music during mealtimes for dementia patients. When compared with baseline levels of agitation and aggressive behaviors a week before music intervention and a week after music intervention ended, the music intervention showed a 46% decrease in negative responses. The behaviors rebounded when music was withdrawn and then declined again when music was reintroduced (Denney, 1997). Similarly, agitated behaviors were reduced 63%, physically nonaggressive behaviors were reduced 56% and verbally agitated behaviors were reduced 74% when relaxing music was incorporated into mealtimes for nursing home patients with severe cognitive impairment (Goddaer, & Abraham, 1994). This supports the efficacy of including music during mealtime to reduce agitation and can be explained by the stress threshold experienced for dementia patients. Positive results for the use of Baroque music for dementia patients in an Australian nursing home have been found for general ambient music playing. Adverse behaviors of calling out, wandering, aggression, talking to self, verbal abuse and signs of agitation, and need for night sedation were reduced by 40% during a 3 week period of ambient Baroque music played. Staff also reported being pleased with the music played (Heim, 2003).

Preferred Music

Outside of mealtime activity results of using relaxing or stimulative recorded music is generally not favorable. Severe dementia patients do not show any changes in percentages of agitated behaviors with background music played when compared with no music conditions (Clair & Bernstein, 1994).

Individuals with dementia who listen to their own preferred music have significantly reduced agitation levels when compared to times when they listen to classical music, listen to readings, or have no intervention (Garland, Beer, Eppingstall, & O'Connor, 2007; Gerdner, 2000; Hicks-Moore, & Robinson, 2008). Therefore, one type of music played for all patients may not be personalized enough to elicit positive changes in agitation.

Effects of Music on Social Behaviors

Both interactive music therapy sessions and passive music listening supervised by nurses have elicited positive social responses for individuals with dementia. The types of social behaviors measured vary across studies, but consistently show improvement. Increasing socialization between dementia patients is one method to decrease feelings of isolation and apathy that is commonly seen with this population. Individuals with middle stage dementia engage in more sitting with others and walking with others during therapeutic singing groups as compared with reminiscing groups (Olderog-Millard & Smith, 1989). Additionally, active participation along with higher verbal and vocal participation during group times is found when individuals attend groups incorporating therapeutic singing.

Similar responses are seen for early and middle stage dementia patients engaged in individual sessions incorporating singing, movement, or instrument playing of preferred music for two weeks. Direct and indirect interactions with others increased by 24% both during sessions and after music therapy sessions ended. Specifically, participants smiled more, made more eye contact, made more verbalizations, and participated at higher rates (Pollack and Namazi, 1992). Also, caregivers perceive their loved one's

social and emotional areas improving after participating in music therapy sessions (Brotons, & Marti, 2003).

Nurses played recorded music to patients in Alzheimer's units for 60 minutes twice per week to see if social and verbal behaviors were impacted at all when compared with a group of individuals who did not attend the music group. Significant differences were found between groups for percentages of verbalizations with individuals talking more after the passive music listening. Differences were also found between groups for the amount of time spent socializing with other group members. Individuals listening to music engaged in appropriate socialization behaviors at higher rates. This study is encouraging for several reasons. Passive music listening is a very easy activity to implement and requires no musical training at all. There is very little cost and time needed to conduct such an activity group. Having outcomes of increased verbalizations and appropriate socialization behaviors give support for organizing an activity that requires such minimal effort to simply play preferred client music.

Caregiver Interactions

Families and facility staff members who provide care for individuals with dementia and Alzheimer's Disease are faced with challenges as they respond to the physical, emotional, social, and cognitive needs of the individual. The high demands placed on caregivers can result in fatigue, exhaustion, depression, isolation, financial stress, and family pressures (Austrom & Lu, 2009; Dhooper, 1991; Kaplan, 1996). The need for alternative methods for engaging patients, staff, and families in positive interactions has resulted in a growing literature base investigating this topic. Music is a low cost and

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accessible modality that can foster interactions for patient, families, and staff. General music and music therapy interventions can have positive effects on individuals with dementia and their caregivers including:

Increasing caregivers' self esteem

Increasing caregivers' satisfaction with time spent with their loved ones and their perceived amounts of time spent in purposeful interactions with each other (Clair & Bernstein, 1993; Clair & Ebberts, 1997).

Increasing number of touches caregivers initiate with their loved ones who in return are more responsive to the touch (Clair, 2002a; Clair & Ebberts, 1997).

Decreasing agitated daytime and nighttime behaviors (Clair 2002b; Gerdner, 2005; Brown, Götell, & Ekman, 2001)

Increase engagement in purposeful activities (Clair & Ebberts, 1997; Götell, Brown, & Ekman, 2003; Mathews & Kosloski, 2000).

Using Music in the Home

Individuals with late stage dementia and their caregivers can experience increased interactions when the caregivers are trained on how to use music in the home. Music used for increasing positive interactions is best when it is individualized for the individual with dementia and created based on their own music preferences and activities. Caregivers who have been trained by music therapists to use music in the home with their loved one report feeling comfortable using music activities and indicate planning on using them after music therapists finish the trainings (Clair, 2002a). Creating music therapy

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sessions for individuals with dementia and their spouse caregivers to participate together can have positive impacts on the caregivers' self esteem, their satisfaction with time spent with their loved ones, and their perceived amounts of time spent in purposeful interactions with each other. Music therapy activities such as group singing, hoop drum playing, and ballroom dancing are examples of interactions that dementia patients can engage in with their spouses (Clair & Bernstein, 1993; Clair & Ebberts, 1997). Instrument playing results in the highest levels of engagement with spouses for individuals with late stage dementia.

When interacting with loved ones with dementia, touch and physical proximity can decline due to the aggressive and disruptive behaviors experienced by caregivers. Participating in music therapy sessions can result in caregivers initiating touch more with their loved ones who in return are more responsive to the touch (Clair & Ebberts, 1997). Another meaningful physical proximity interaction for spouses caring for late stage dementia patients is dancing to music. Dancing can provide a positive way to have close physical contact when other types of contact are uncomfortable.

Dancing can be modified when an individual loses the strength to stand by engaging in seated dances. Interlocking arms and swaying to music, using cheek to cheek proximity, and even hugging from behind the seated person to move to music are all options for interacting with positive physical touch for couples (Clair, 2002b). Utilizing the patient's preferred dance music can be easily facilitated by staff with no musical training.

Staff Using Music Within Facilities

Caregiver staff who participated in 5 training sessions including music applications, how to lead a session, data collection methods, feedback, and recommendations for improvement were able to successfully lead music sessions with dementia patients and determine their engagement levels in the sessions. Activity engagements for rhythm activities, movement activities, and singing activities all yielded similar results when lead by a music therapist or by the facility activity staff with little to no formal music training (Clair, 2005).

Clair (2002c) describes how music can be easily used by caregivers with no musical abilities to manage agitated behaviors shown by late-stage dementia patients. When dementia patients show a cycle of getting agitated at pinpointed time of day or night, the cycle can be interrupted by creating a “musical timeout”. Dimming the lights, playing sedative music preferred by the patient for at least 30 minutes, and modeling sitting in a chair while encouraging the patient to do the same can increase physical relaxation to prevent the disruptive behavior from occurring. Beginning thirty to forty minutes before a pinpointed agitation time and singing familiar songs with a patient for fifteen to twenty minutes can also provide an interruption for the outbursts. Progressive muscle relaxation paired with sedative preferred music works well to physically relax a patient before a pinpointed aggressive behavior occurs. After turning on the sedative music, caregivers can verbally instruct the patient to tense and release each muscle of group of muscles for a duration of four to five seconds and then release and relax the muscles for four to five seconds. Many times, caregivers providing a model for muscle

tension and releasing will aid the patient in engaging appropriately in the progression muscle rela