

# The Connection Between Music Therapy and Language Abilities in People with Dementia

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## ABSTRACT

Due to the advancements of technology and the overall improved quality of life within society, the general life expectancy has increased. As a result, one of the serious leading age-related conditions in the population is dementia. Memory loss, agitation, loss of ability to communicate, and anxiety are a few symptoms that negatively impact those who have dementia. Therefore, it is essential to identify practical and cost-friendly treatment options for those symptoms. The purpose of this paper is to explore music therapy on language functioning in individuals who suffer from dementia. Few studies have addressed this connection, so this literature review was written to summarize the findings thus far. Surprisingly, evidence was found that supports the argument that music therapy may improve language functions in patients with dementia. Afterwards, a survey was conducted to analyze the application of music therapy in elderly care facilities. These discoveries were then presented through an opinion piece ending with recommendations to decrease the suffering of people with dementia.

## **Introduction**

Dementia is a prevalent issue many older individuals encounter. There will be “a considerable increase in the number of demented elderly from 25 million in the year 2000 to 63 million in 2030” (Wimo et al., 2003). 135 million people will suffer from this disease by the year 2050 (Altenmuller et al., 2015). Brain deterioration and cognitive decline caused by dementia lead to memory loss and difficulty communicating (Altenmuller et al., 2015), which brings about a decrease in quality of life. As of now, no cure exists (Altenmuller et al., 2015). By exploring the effects of music therapy (MT) on patients with dementia, possible avenues to alleviate dementia symptoms, such as language loss, may be determined. The intention of this study is to further the amount of prophylaxis options and perhaps provide a more economic approach rather than costly medications when treating dementia. This paper takes discoveries from numerous research articles about the effects of MT on language abilities in dementia patients and analyzes the relative impact. Following the previously discovered research, emphasis for this question will be directed towards uncovering how music and language are intertwined in the brain. Limited neuroscience research exists connecting the three topics of music, language, and dementia. The focus will be on identifying the relevancy of MT on linguistic abilities of dementia patients, whether the impact be positive, negative, or neutral. The reason why it is necessary to explore non-invasive ways to limit the inconvenience of dementia symptoms, such as MT, is due to the positive, notable quality of life difference of individuals who do not have dementia compared with those who do have dementia. In this paper, we will first define the broad terms of music therapy, dementia, and language functioning in people with dementia (PWD). Moving forward, we will determine the scientific links between the mentioned terms by examining past research. Afterwards, I will conduct my own survey on the availability of MT in elderly care homes, where dementia may be prevalent, and present my opinion and recommendations on what the government could do to enhance well-being among PWD.

## Methodology

A literature review will be followed by an opinion piece. Gathering and accessing clinical data is not feasible for a high school student, so the focus will be on literature review. Google Scholar was the primary database. Combinations of the searched terms include dementia and music therapy, dementia and language, music therapy and language. After careful reading, the key concepts were analyzed in relation to each other in a conceptual analysis. When selecting articles to incorporate, different perspectives and results of experiments were taken into consideration because this paper intends to summarize results without bias. Therefore, it is essential that I studied a diverse and varied group of papers in order to form my conclusion.

### Music Therapy

This section will explain how the term MT will be applied. Broadly, MT is the use of music to alleviate symptoms including stress and anxiety (Bleibel et al., 2023). MT is split into two main categories: passive therapy versus active therapy. Passive MT, otherwise called receptive therapy (Ingram, 2012), is when PWD receive some form of music. This can be seen whenever somebody sings, plays a recording, or provides some type of music to a patient with dementia. Oftentimes studies will use familiar or preferred music of the patient, famous melodies, and songs of a patient's past (McDermott et al., 2014). On the other hand, active MT is when PWD engage and participate in the creation of music (Ingram, 2012). This is demonstrated through singing, playing an instrument, or composing pieces; it can also be as simple as clapping hands or drumming on thighs (Reed, 2019). In addition to the mental stimulation observed during passive or active MT, there is a physical aspect to this therapy as well when perceived through dancing after hearing music (Reed, 2019).

### Dementia

This section defines the term dementia and explains the symptoms and importance of identifying methods to alleviate the symptoms. Dementia is the cognitive decline due to the death of brain cells. Symptoms of dementia include hallucinations, agitation (Müller-Spahn, 2003), memory loss, difficulty understanding words, lack of verbal expression, agitation, and depression (Moreno-Morales et al., 2020). These symptoms negatively impact the quality of life of PWD and their loved ones (Bleibel et al., 2023). Unfortunately, a cure does not exist but there are ways to lessen the symptoms including pharmaceutical options such as "antidepressants, sedatives, or neuroleptic medications" (Reed, 2019, p. 6). Although medications exist, some studies claim they are ineffective (Bleibel et al., 2023) or have serious side effects such as nausea and confusion (Reed, 2019). That being the case, as the population's lifespan increases, so does the impact of this cognitive disorder that targets aging. For that reason, it is crucial that prophylaxes are approved in order to lessen dementia symptoms.

### Music Therapy and Dementia

This section provides a possible link between MT and decreased symptoms of dementia. With the increase in dementia, much effort has been made to identify therapies that will alleviate symptoms. One popular option is MT due to the general agreement of having an effect on PWD (Brotons & Koger, 2000). On one hand, there are clear benefits of MT on behavioral and psychological symptoms of dementia (BPSD) of PWD. One study suggests that listening to music elicits positive reactions shown through a smiling face and a better mood in PWD. In addition, tests directly after the session show hormone level and heart rate differences from before the session, enhanced attention, and improved executive functions in patients. Furthermore, some PWD remembered names of old friends when they participated in singing (Altenmuller et al., 2020). This is consistent with

the theory that “music is closely linked to personal identity and life history of an individual” (McDermott et al., 2014, 715). On the other hand, many studies refute the idea that MT relieves dementia symptoms (Nair et al., 2013). A study conducted by nine Italian institutions compared standard care, which was defined as browsing news articles or engaging in a card game, with MT or listening to music and found that there was minimal difference between the two results (Raglio et al., 2015). Many papers recommend further research and analysis in order to reach a more solid argument that MT could have an impact, more specifically a positive impact for PWD (Nair et al., 2013). MT is advantageous, more cost-friendly, customizable, and non-intrusive to the body compared to other therapies (Bleibel et al., 2023). Some limitations of using MT instead of medicine include a shortage of qualified music therapists or when the dementia is quite serious and the individual cannot engage in MT due to limitations cognitively or physically (Bleibel et al., 2023). In conclusion, the “easily accessible and stimulating medium” (McDermott et al., 2014) of music can be a technique to ease dementia symptoms.

## Language and Dementia

This section presents evidence on how dementia may affect language abilities in PWD. Dementia can cause moderate to severe language impairments and speech difficulty which oftentimes results in communication challenges in PWD. Some struggles include reading, writing, understanding situations, “speaking fluency, comprehensiveness, word production, syntax and verbal feedback” (Banovic et al., 2018). This frequently leaves PWD feeling disoriented, stressed, and disconnected from family and friends (Reed, 2019). Forgetting or swapping out words may be an indication that language impairments exist in PWD (Banovic et al., 2018). More research should be conducted to appropriately test the capabilities of current rehabilitation tools for language impairments in PWD (Krein et al., 2019).

## Music and Language Abilities

This section identifies the possible connection of music and linguistics in the brain. Music and language production are unique characteristics of humans. They are typically compared to one another due to their similar nature, neurological interconnection, and “functional and anatomical overlap” (Altenmuller et al., 2015): pitch, rhythm, words, ability to show emotion, and tendency to combine words to make a phrase. Therefore, due to these analogies, this suggests that similar brain mechanisms are activated during music and language. It is a common idea that music and language have “homologous regions of opposite hemispheres” (Brown et al., 2006). Essentially, music and language are found in the same area inside a brain hemisphere except with speech in the left hemisphere and music in the right hemisphere.

## Conceptual Connections Between Music Therapy, Language, and Dementia

This section attempts to connect music therapy, language, and dementia to comprehend the effects each have on each other. Following the analysis of music therapy, language function, dementia, and their individual relationships, a deeper investigation into these three seemingly intertwined fields will be explored. It has been hypothesized that there are more benefits of MT than just helping with BPSD (McDermott et al., 2014). For example, studies focused on using MT to increase the lost language functions in PWD have found that verbal fluency improved after MT (Altenmuller et al., 2015). Specifically, conversational abilities such as the depth and content of the speech were elevated following singing and rhythm classes (Brotons & Koger, 2000). Another concluded that sung information is better retained than spoken information. The study indicates that after four weeks, PWD remembered more content from the sung lyrics than the spoken lyrics. Furthermore, the general theme of the information was better understood (Altenmuller et al., 2015). Along the same lines, active

MT is suggested to be more effective than passive MT (Bleibel et al., 2023) with more “positive impact on speech content, speech fluency and category fluency” (Ingram, 2012, 4). In contrast, some propose MT is more impactful in PWD with past experiences in music rather than PWD who have little to no experience (Reed, 2019). A study conducted in 2017 analyzed by Reed found that memory retention from sung mnemonics was only better in PWD with past musical background. PWD with little musical background responded better to the spoken mnemonic (Reed, 2019). Additionally, it was postulated that “music training would enhance speech and language processing because it places higher demands on shared neural networks, elicits emotional rewards, and requires repetition and attention” (Neves et al., 2022). Although there has been substantial evidence demonstrating the benefits of MT on language abilities in PWD, more research is required to further comprehend the capacity of significance. Moreover, some argue that the application of MT for PWD needs to be more systematic between retirement homes or dementia care programs (Ingram, 2012). Fortunately, more effort is being put into this field due to the non-pharmaceutical appeal of music and desire to lessen the inconveniences of dementia symptoms with a mild approach.

## Survey

I conducted a survey regarding the MT programs offered at elder care facilities in North Carolina. Since elder care programs may come across PWD, it is important to assess the programs available that may better assist and improve the quality of life of these individuals. The purpose of this survey was to identify possible assets or lack of in elder care programs.

There are many reasons why I conducted a survey. Firstly, I wanted to get a sense of the programs offered at senior living facilities besides basic amenities that may enhance the quality of life for the residents. Secondly, I hoped to determine whether MT and music education options were available at these programs. Finally, I specifically chose North Carolina because I hoped to better understand the MT availability around my area. My survey procedure will follow: I listed the senior center name, programs offered for the elderly, and specifically highlighted if music programs were offered. Finally, I evaluated MT availability.

**Table 1.** Music Therapy Availability in 10 Senior Care Facilities in North Carolina

Name	Programs Offered	Music Therapy	Website
The Levine Senior Center	Painting, Cards, Table Tennis, Pickleball, Pool, Wellness Center	None	<a href="https://www.levineseniorcenter.org/">https://www.levineseniorcenter.org/</a> (Accessed 14 Aug 2023)
The Shepherd's Center	Writing, guided discussions on archaeology, current events, Tea Tasting	None	<a href="https://www.shepherdscharlotte.org/">https://www.shepherdscharlotte.org/</a> (Accessed 14 Aug 2023)
Brightmore of South Charlotte	Book Club, Game Night, Arts and Craft, Music Therapist	Music - one therapist who occasionally stops by to play instruments, helps residents create their own songs, or sing-along	<a href="https://www.brightmoreofsouthcharlotte.com/lifestyle">https://www.brightmoreofsouthcharlotte.com/lifestyle</a> (Accessed 14 Aug 2023)

Sharon Towers at South Park	Wellness Center, Pool, Arts and Craft, Technology, Music Therapist	Music - one therapist who plays instruments and musical Jeopardy with residents	<a href="https://sharontowers.org/health-wellness/health-care-center/">https://sharontowers.org/health-wellness/health-care-center/</a> (Accessed 14 Aug 2023)
Southminster	Painting, Techolony, Woodworking, pool, Library, Gardening	None	<a href="https://www.southminster.org/">https://www.southminster.org/</a> (Accessed 14 Aug 2023)
The Cypress of Charlotte	Pickleball, Painting, Pool, Wellness Center, Technology	None	<a href="https://thecypressofcharlotte.com/lifestyle/">https://thecypressofcharlotte.com/lifestyle/</a> (Accessed 14 Aug 2023)
Providence Meadows Gracious Retirement Living	Cards, Writing, Arts and Craft, Gardening, Cooking	None	<a href="https://seniorlivinginstyle.com/providence-meadows/">https://seniorlivinginstyle.com/providence-meadows/</a> (Accessed 14 Aug 2023)
MerryWood on Park	Game Night, Wellness Center	None	<a href="https://bridgeseniorliving.com/">https://bridgeseniorliving.com/</a> (Accessed 14 Aug 2023)
Holiday Carmel Place	Wellness Center, Library, Yoga, Writing, Origami, Bible study, tree planting	None	<a href="https://holidayseniorliving.com/">https://holidayseniorliving.com/</a> (Accessed 14 Aug 2023)
Legacy Heights Senior Living	Wellness Center	None	<a href="https://www.fivestarseniorliving.com/communities/nc/charlotte/legacy-heights-senior-living-community/memory-care?utm_medium=organic&amp;utm_source=local&amp;utm_campaign=google%20business%20profile">https://www.fivestarseniorliving.com/communities/nc/charlotte/legacy-heights-senior-living-community/memory-care?utm_medium=organic&amp;utm_source=local&amp;utm_campaign=google%20business%20profile</a> (Accessed 14 Aug 2023)

## Analysis of Survey

It is clear from the above data that many senior living facilities lack MT or music education programs. Although these facilities were focused in North Carolina, the generalization might be made that MT is scarce in retirement homes. Only two facilities (Brightmore of South Charlotte and Sharon Towers at South Park) out of the selected ten senior centers provided MT sessions for residents. This survey clearly demonstrates the lack of MT.

## Opinion: Essential That More Music Therapy Is Offered at Elder Care Homes

With the increasing evidence that MT has many benefits for language functions in dementia patients, I believe it is essential that more elderly care places provide MT. Due to the prevalence of dementia in the aging population, MT is becoming a popular low-cost non-invasive option to lessen symptoms. Therefore, government-owned and privately-owned elder care homes should take the opportunity to invest in employing qualified music therapists to combat the symptoms of dementia and lower the negative impact. While I recognize that MT may

be limited in publicly funded facilities due to limits on government spending, the government has a certain duty to ensure the well-being of their citizens, including vulnerable populations like PWD. Additionally, with the possible positive effects that MT has on alleviating dementia symptoms, investing in MT can reduce medical costs by lowering the amount of PWD that require intense medical attention and enhance the quality of life for dementia patients. Further, privately-owned elder care homes equipped with music therapists may attract more customers because they will have specialized dementia care services. I hope an increasing number of private companies can incorporate MT sessions in their elderly care enrichment and lifestyle programs.

Although only two out of the ten senior living facilities have a record and history of MT sessions, I believe it is imperative these sessions are more regular or offered as a class at the facilities because only after repetitive sessions can the language abilities and overall cognitive function of PWD drastically improve. It is important to point out that a possible factor as to why only a few elderly care facilities offer MT is due to the lack of awareness and knowledge of the benefits of MT for dementia patients and their ability to communicate. Ultimately, I believe there needs to be a push to use MT equally with medications for dementia symptoms and to ensure that a majority of senior care facilities have a music therapy option if funding is available.

## Conclusion

This paper explored the possible effects of music therapy on linguistic functioning specifically in individuals with dementia. The discoveries suggest MT may have a positive impact on the language abilities in dementia patients, yet further research is needed. Plenty of research has been conducted on the effects of music on people who suffer from dementia, the loss of language in dementia patients, and the similarities between music and linguistics; however, few studies have investigated the possible correlation among all three topics. Due to the predicted increase of dementia in the population, it is vital more research efforts are made to discover effective ways to lessen dementia symptoms. The opinion section of this paper urges government and privately owned elderly care facilities to employ active music therapists and provide music programs in these facilities as a way to minimize BPSD and improve the overall quality of life of PWD.

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