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Does music therapy decrease agitation in patients with dementia?

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Does music therapy decrease agitation in patients with dementia?

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Introduction

Dementia is an encompassing word that includes specific symptoms which alter a patient’s problem-solving ability, decision making capacity, and personality.\(^1\) Personality changes, otherwise known as Behavioral and Psychotic Symptoms of Dementia (BPSD) can have negative impacts on caregivers and families. BPSD can include agitation, depression, elation, and hallucinations.\(^2\) Agitation is generally defined as inappropriate verbal, vocal, or motor behavior that is not based in a direct need or confusion.\(^3\) Agitation towards a caregiver can result in mistrust, poor psychosocial relationships, and violence. As dementia progresses, agitation is the most significant factor in patient and caregiver distress.\(^4\)

According to the Alzheimer’s Association, it is estimated that 5.5 million Americans in 2017 are living with Alzheimer’s Dementia.\(^5\) This number is anticipated to increase over the next ten years. One study suggests that agitation is present in 50.4% of patients with dementia.\(^6\) Due to the high prevalence of agitation, it is important to note that agitation is a strong predictor of poor quality of life (QOL) and nursing home admission.\(^6\) To reduce caregiver burden and improve QOL, agitation should be treated. The current standard treatment for dementia does not affect BPSD, instead antipsychotic medications which carry harsh side effect profiles must be used.\(^1\) Current research is focused on identifying non-pharmacologic methods for treatment of BPSD to avoid adverse events caused by current prescribing and treatment practices.

Music therapy has been proposed as a non-pharmacologic treatment for BPSD in patients with dementia. Music therapy has been defined as ‘application of music and/or its elements by a qualified musical therapist in order to support and stimulate various aspects of
cognitive, emotional, social and physical needs." Researchers have also suggested that individualized music therapy may have a stronger impact on BPSD. The term individualized music refers to music that is familiar and known to be enjoyable to the patient. To date, a concrete mechanism has not been identified that would explain the proposed impact of music therapy on BPSD in patients with dementia. The working theory is that the brain consists of a default mode network (DMN). The DMN is not clearly understood, but it is believed that atrophy of the DMN correlates to cognitive and emotional impairment, ultimately leading to BPSD. Listening to music has been shown to activate the DMN, leading researchers to believe that this could strengthen and prevent atrophy of the DMN. Utilizing this proposed mechanism, music therapy’s activation of the DMN could treat BPSD. Although this has been accepted as the working mechanism, current research focuses on the impact of music therapy on BPSD without looking at the physiologic and neurologic basis behind the effect.

This research is intended to identify whether or not music therapy decreases agitation in patients with dementia. This paper may serve as a centralized assessment of some of the current studies pertaining to music therapy’s impact on agitation. The goal is to provide evidence based recommendations on whether music therapy should be incorporated into treating BPSD, specifically agitation, secondary to dementia.

**Background: Literature Review**

Providers who manage patients with dementia increasingly recommend non-pharmacologic treatments for agitation. Multiple non-pharmacologic modalities have been proposed to reduce agitation, but evidence of efficacy is lacking. Music therapists, psychologists, and researchers have conducted randomized controlled trials, systematic
reviews, and observational studies in an effort to determine if music therapy can be utilized to reduce agitation. This literature review contains a synthesis of current research on music therapy and agitation secondary to dementia and its impact in relation to provider of treatment, timeline, and varying environments. The overarching goal is to provide information that will serve as the basis of discussion.

Caregiver v. Music Therapist

Caregiver and family feedback has suggested that music therapy can be an effective treatment. A qualitative study (n=12) observed that when music therapy has been administered by the caregiver or family member, a short-term reduction in agitation has been noted.\(^8\) When a caregiver administered individualized music therapy determined by using the Assessment of Personal Music Preference (APMP) in a quantitative study (n=42), agitation was lower after listening to thirty minutes of music during reportedly peak BPSD times when measured by a modified version of the Cohen-Mansfield Agitation Inventory (CMAI) (p<0.05).\(^9\) Alternatively, researchers looked at the effectiveness of music therapy when provided by trained music therapists (MTs). A mixed-method feasibility study (n=17) based on interviews, caregiver feedback, and evaluations administered by two trained MTs showed a significant decrease in agitation at baseline and seven months following treatment (-25.52; -39.10-11.95).\(^10\) A quantitative exploratory study (n=132) performed by music therapists using group therapy found a reduction in agitation measured by CMAI (p<0.05).\(^11\) A similar quantitative study (n=45) looking at the efficacy of music therapy administered by MTs found that agitation decreased when compared to themselves (p<0.05), but a significant reduction was not found when compared to the control group upon analysis of CMAI scores (p=0.432).\(^12\) While data largely
supports the efficacy of music therapy when provided by MTs, studies have not been done to demonstrate that they obtain higher reductions in agitation than family or caregiver administration.

**Individualized v. General**

Some researchers postulate that individualized music therapy is more effective in reducing agitation and the available data supports this claim. A qualitative study that looked at challenges and solutions to treating agitation in dementia found that the effect on agitation was stronger if music was based on patient preference.\(^{13}\) A similar quantitative study of participants (n=39) with severe dementia found that interactive, individualized music was better than passive, generalized forms of music therapy when assessed using the Faces and Interactive scales (p<0.025).\(^{14}\) Passive meaning simply listening to music, rather than engaging in singing or rhythmic activities. Although general or individualized music therapy appears to be effective when administered by a caregiver, individualized music therapy provides a reduction in agitation during times that are of highest distress to both the patient and the caregiver. Data supports the use of individualized music therapy over general, but does not discount the impact that general music therapy can have should that be the only available option.

**Agitation and Environment**

Impact on frequency of agitation versus severity was compared in one quantitative trial (n=42). It found that the frequency of BPSD when measured by the CMAI did not decline (p=0.378), but that severity of agitation was significantly less than those who did not receive music therapy when measured by a modified CMAI designed to assess severity (p=0.027).\(^{3}\) Another quantitative study done in acute care settings found opposing results (n=25). It was
discovered that frequency of agitation was lower during music therapy sessions when measured by theObserved Emotion Rating Scale (p=0.045).\textsuperscript{15} A quantitative study focusing on playing music during meal times, specifically in skilled nursing facilities was performed (n=22). It was shown that music played at meal times decreased global agitation measured by the CMAI, meaning patients had a more positive interaction with peers and were capable of engaging in a group environment with fewer agitation symptoms (p<0.001).\textsuperscript{16} The study did not look at what types of music specifically were best, so further studies would be needed to identify if certain genres or time-periods were most impactful. These studies provide a mixed ideology of what aspect of agitation itself is treated by music therapy. These data sets present further questions for how exactly agitation is affected and whether or not music therapy can replace the function of antipsychotics in all situations and environments.

\textit{Efficacy and Long-Term Impact}

Duration of efficacy following music therapy has also been examined. All studies analyzed that looked into long-term effects initially noted improvement, but varied on how long improvement was sustained. One study (n=132) noted that two weeks following the completion of their music therapy trial, reduction of agitation in patients with dementia was no longer significant according to analysis of repeat CMAI scores (p>0.05), but still remained lower than pre-trial levels (p=0.018).\textsuperscript{11} A similar quantitative study (n=39) looking into duration of efficacy also noted BPSD increased two-weeks post therapy when assessed by the Behavioral Pathology in Alzheimer’s Disease Rating Scale (p<0.025).\textsuperscript{13} Four weeks was the longest post-trial assessment analyzed in this review. It was found that there was no difference between two-weeks and four-weeks post therapy participant (n=48) CMAI scores, but BPSD was higher than
when measured during treatment (p=0.02). Literature discussed thus far includes a wide range of dementia severity, ranging from mild to severe. Two studies focused on the reduction of agitation in patients specifically with severe dementia. Both found improvement in BPSD during music therapy trials, but did not comment on the lasting impact. Lack of either examination of efficacy or the data to support long-term efficacy weakens the argument for music therapy to replace antipsychotics. The data does not support sustained efficacy and does not propose therapy timelines. These missing recommendations make it challenging to suggest a specific treatment plan for patients with agitation secondary to dementia.

Systematic Reviews

Two systematic reviews were included to obtain an overall representation of the available data. One systematic review found differing results in regard to agitation. In an analysis of six randomized controlled trials and five clinical trials, a decrease was noted (-0.49; -0.82 to -0.17). But when looking at a separate five randomized controlled trials and five clinical trials, the same reviewers found no improvement. The systematic review also compared music therapy to other modalities proposed to treat agitation in patients with dementia and found that among sensory stimulation, only music therapy was shown to be effective. Not all studies pertaining to the efficacy of music therapy have demonstrated improvement in agitation. A Cochrane review that amassed 515 participants found that there was no reduction in agitation when patients utilized music therapy in place of antipsychotics. Although, through a further comprehensive review article that focused on utilizing music as medicine, it has been suggested that although music therapy is not as effective as antipsychotics, it does not carry the same negative side effect profile. The differing results of these large systematic reviews reflect the
issue that purveys the previously analyzed articles. High quality research with large sample sizes, standardized assessment tools, and long-term follow up are not available to identify the true impact, or lack thereof, of music therapy on agitation. Study results are summarized in Table 1.

Summary

The current literature incorporated into this review presents mixed evidence on whether or not music therapy can be utilized as the primary treatment for agitation secondary to dementia. Caregivers, families, and MTs are able to obtain a reduction in agitation using various methods of music therapy, but results are not consistent, making it unclear if the provider has an impact on the quality and efficacy of music therapy. Long-term follow up was present in few studies, adding to the difficulty of creating a specific recommendation that includes frequency, length, and type of music therapy aimed at reducing agitation in individuals. Further research is necessary to guide this conversation and determine the exact role of music therapy in this setting, but music therapy should still be offered as an option prior to initiating antipsychotic medications based on the efficacy and lack of negative side effects observed and demonstrated in certain individuals, populations, and settings.

Methods

Research was initiated through PubMed searches. Key terms included were ‘dementia’, ‘music therapy’, and ‘agitation’. Studies and articles were sorted by the most recent. An intentional effort to review varying study models was made to include randomized controlled trials, systematic reviews, review articles, and meta-analysis. Reference lists were reviewed and articles were selected for further consideration.
Prior to selecting studies and articles for further review, the methods section of each was analyzed to check for controls, validated scales, patient selection processes, and analysis technique. No studies were excluded based on methods. Methodologic concerns are noted within the discussion section.

Exclusion of studies was based on quality concerns. Papers with large grammatical or spelling errors were omitted and not analyzed. Studies were omitted that did not have references or were not peer reviewed. This has the potential to inflect bias, but it was determined that this approach was better than including potentially poor data sets and statistical analyses.

Accepted studies were read through entirely and information was extracted for incorporation into this analysis. Results were compared to insure each side of the topic was addressed, as well as to identify potential differences in the impact different methods of music therapy (individualized vs generalized) may have. Following the extraction and comparison of data, the data was compiled and results were interpreted for the use of medical providers.

**Discussion**

Music therapists have proposed their field as an answer to eliminate the need for, and potential overuse of, antipsychotics. Current research is aimed at providing evidence for the incorporation of music therapy in the treatment of agitation secondary to dementia. Many facilities, both public and private, through the support of individual families, have already begun utilizing music in the care plans of these patients. While multiple studies support this approach, some studies do not demonstrate this same efficacy. It must be decided based on
current research, whether or not music therapy should be offered as the new standard of care for this subunit of BPSD.

Current research supports the use of music therapy by both caregivers and music therapists, however one must consider which approach is best. This determination will affect how, when, and to whom providers can refer to for music therapy. Presently, there is no research that suggests that the administrator impacts the outcomes, but it may be assumed, as is true for most professions, that a trained individual would be capable of making informed treatment choices and plans. This being said there are clear benefits for use of music therapy by caregivers. This treatment could be used to bond and form a lasting meaningful relationship, reducing emotional and psychological stress of the caregiver, while improving the QOL of the patient throughout the end stages of dementia. Studies are needed to determine when and how music therapy care can be transitioned from a trained professional to that of a lay person.

Selecting between the use of individualized or general music therapy is another topic among researchers looking at treating agitation. Typically, current results demonstrate a greater outcome when music has been tailored to meet the patient’s personal needs and desires. However, one must acknowledge the time and effort needed to coordinate this level of care. In comparison to generalized group therapy, an increase in staffing required to administer individualized treatment to each patient would be required. In order to justify this allocation of resources, studies must be completed that show a reduction in cost in other areas of care. These areas might include hospital admissions secondary to injuries from BPSD symptoms, psychological evaluations, and provider visits to adjust medications meant to control agitation symptoms. Even though studies suggest that individualized music therapy is a better, it should
be examined whether or not generalized music therapy is adequate. This is similar to the treatment of other chronic conditions in regard to the fact that they typically have a very effective, expensive treatment, but also other options that are typically more affordable and available to a larger percentage of patients while achieving reasonable outcomes.

Environment can impact a patient’s agitation severity and frequency and studies have been done to look at music therapy’s role in varying situations. The research suggests that music played during meal times or acute care stays may reduce agitation. However, this assertion draws attention back to the idea of individualized versus generalized music therapy previously discussed and once again the feasibility of such treatment in these scenarios. In a dining setting, it is unclear how one would approach the task of identifying and selecting music that would benefit all of those present. Currently, facilities would have to employ trial and error. Studies presenting common calming themes would be needed to inform these choices. Even more importantly, in an acute care setting, studies demonstrating how much time would be needed to determine and administer the method of music therapy needed, in comparison to that of administering a single medication. Evidence that outcomes are either the same or better would be required before providers could justify replacing the use of oral and IV medications.

Although current studies generally support the use of music therapy in patients with agitation secondary to dementia, they do not clearly answer questions of efficacy and long-term impact. There are still conflicting results when studies are compiled into systematic reviews, creating further questions of whether or not music therapy should become the new standard of care. The research shows that following the cessation of music therapy, BPSD symptoms return. Even though this is not different than the continued need to use
antipsychotics when agitation returns, time and cost could be the deciding factor for providers and insurance companies. Studies are missing that can demonstrate a specific, prescriptive method that describes the frequency and schedule needed for music therapy to effectively treat and maintain a patient’s BPSD status.

If music therapy is to replace antipsychotics as the mainstay of treatment its efficacy should be equal to, or better than that of antipsychotics, or have benefits that far outweigh the risks of antipsychotic use. It has been shown that music therapy, although not as effective as antipsychotics, does not increase the risk of cardiovascular events and parkinsonism like the current medical treatment. The lack of side effects may be particularly alluring to patients who have a personal or family history of cardiac events and are looking to avoid increasing their risk. It is then up to patients, families, and providers to decide since current research suggests there may be some benefit but cannot draw any firm conclusions that exclude the need for antipsychotic medication.

One consideration that addresses both the supporting and opposing data, is that validated scales for measuring the impact of music therapy on BPSD are not widely available. Researchers, like McDermot, have developed their own tools to assess agitation but these tools are not universally utilized or accepted. The challenge that presents then when determining a reduction in agitation is that of the subjective observer. People have different tolerances for certain behaviors. Even when the same observer watches ten patients, their tolerance for each person may vary depending on the patient’s personality, ability to form a relationship, and even appearance, gender, race, or ethnicity. Without a validated and universal scale to assess agitation, identifying a significant reduction may not be meaningful.
Conclusion

Music therapy should be considered an option in managing agitation in patients with dementia that do not have any absolute indications for antipsychotics. It is easily administered by caregivers and families in a home setting and may help maintain a healthy and supportive relationship through the end stages of dementia. Skilled nursing facilities can use it during meal times to keep more patients in the dining room, providing patients the benefit of social engagement and maintained dignity. Although evidence for efficacy varies, there are no side effects in the literature. Widespread use may provide an increase in QOL and a reduction in the use of antipsychotic medications in which overuse has been criticized.

Ultimately, patient well-being should be the most important consideration when choosing between music therapy and antipsychotics. Patients should be presented with available information pertaining to music therapy and its use in patients with dementia. Figure 1 may be helpful to provide patients a brief summary of music therapy and the evidence behind it. As with any condition, patients deserve to know all the available treatment options and the evidence, risks, and benefits for each. Including music therapy as a modality, while maintaining the understanding that the current best treatment is antipsychotics, would enhance the patient-provider relationship and allow for a more informed, patient-centered decision.
References:


## Appendix

Table 1. Summary of background literature review results and statistical analysis when available. Boxes containing N/A indicate the information was not available.

<table>
<thead>
<tr>
<th>Study Reference #</th>
<th>Sample size (n)</th>
<th>Study Method</th>
<th>Outcome</th>
<th>Statistical Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Systematic Review of 6 RCTs and 5 CTs</td>
<td>Reduction in agitation</td>
<td>-0.49 95% CI: -0.82 to -0.17</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>42</td>
<td>Quantitative</td>
<td>Reduction in severity but not frequency</td>
<td>p=0.027</td>
</tr>
<tr>
<td>8</td>
<td>12</td>
<td>Qualitative</td>
<td>Increase in non-aggressive behavior</td>
<td>N/A</td>
</tr>
<tr>
<td>9</td>
<td>42</td>
<td>Quantitative</td>
<td>Agitation lower thirty minute after music therapy</td>
<td>p&lt;0.05</td>
</tr>
<tr>
<td>10</td>
<td>17</td>
<td>Mixed-Method Feasibility</td>
<td>Decrease in agitation between baseline and seven months</td>
<td>-25.52 95% CI: -39.1 to -11.95</td>
</tr>
<tr>
<td>11</td>
<td>132</td>
<td>Quantitative</td>
<td>Group therapy performed by music therapists showed reduction in agitation</td>
<td>p&lt;0.05</td>
</tr>
<tr>
<td>12</td>
<td>45</td>
<td>Quantitative</td>
<td>Reduction in personal agitation, but not significant when compared to control</td>
<td>p&lt;0.05; p=0.432</td>
</tr>
<tr>
<td>13</td>
<td>N/A</td>
<td>Qualitative</td>
<td>Music based on patient preference showed greater decrease in agitation</td>
<td>N/A</td>
</tr>
<tr>
<td>14</td>
<td>39</td>
<td>Quantitative</td>
<td>Interactive music is more effective than passive</td>
<td>p&lt;0.025</td>
</tr>
<tr>
<td>15</td>
<td>25</td>
<td>Quantitative</td>
<td>Frequency of anger lower during music therapy sessions</td>
<td>p=0.045</td>
</tr>
<tr>
<td>16</td>
<td>22</td>
<td>Quantitative</td>
<td>Meal time music increased non-aggressive behavior</td>
<td>N/A</td>
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<tr>
<td>17</td>
<td>48</td>
<td>Quantitative</td>
<td>BPSD symptoms increase post-music therapy but remain below baseline</td>
<td>p=0.02</td>
</tr>
<tr>
<td>18</td>
<td>22</td>
<td>Quantitative</td>
<td>Music therapy for agitation in patients with severe dementia</td>
<td>P=0.031</td>
</tr>
<tr>
<td>19</td>
<td>Cochrane Review</td>
<td>No reduction in agitation</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>
REVIEW QUESTION
Can music therapy decrease agitation in patients with dementia?

TYPE OF REVIEW
Analysis of available literature. PubMed search with terms 'Dementia + music therapy' and 'Dementia + music therapy + agitation'. Studies with large grammatical or spelling errors were excluded due to concerns for validity.

RELEVANCE FOR PRIMARY CARE/MUSIC THERAPY

CURRENT STANDARD TREATMENT
Antipsychotic medications are currently the most widely used treatment for agitation in patients with dementia. These drugs have serious side effects including increased risk of cardiovascular events. Often times these medications may be misused to simply calm a patient without addressing their physical, emotional, or psychological need.¹

MUSIC THERAPISTS
Music therapy is a growing field. As people search for non-pharmacologic treatment, the need for evidence-based, effective tools are needed. Music therapy offers a wide range of skills and treatments which may improve patient outcomes or at the very least provide the same benefit without harmful side effects. Validated assessment scales need to be developed in order to show the impact music therapy can have on agitation and dementia.²

WHAT DOES THE DATA SAY?

PROS:
A study of 132 participants found a modest reduction in agitation (p<0.05).³ A systematic review of 6 RCTs and 5 CTs found a decrease in agitation as well (0.49 95% CI: -0.83 to -0.17). These results indicate that music therapy may be effective. Larger studies with long-term follow up need to be performed to assess the overall impact and provide further evidence for a reduction in the use of antipsychotic medications.

CONS:
A Cochrane review of 515 subjects found no reduction in agitation when used for patients with dementia.⁴ This review, although not all encompassing of current research, demonstrates the need for stronger studies on music therapy pertaining to agitation and dementia.

PROVIDER/PATIENT ADVICE:
It has been shown that music therapy, although not as effective as antipsychotics, may still have a positive impact on agitation symptoms while avoiding side effects.⁵ Further research is needed to determine if music therapy can replace the use of antipsychotics in all patients, or if a more individualized approach with trial and error may be needed.

REFERENCES

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