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Spring 2021

The Effects of Music Therapy on Older Adults with Dementia: A Systematic Review

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Recommended Citation

Swogger, Sydney and Throckmorton, Kahli, "The Effects of Music Therapy on Older Adults with Dementia: A Systematic Review" (2021). *Williams Honors College, Honors Research Projects*. 1263. https://ideaexchange.uakron.edu/honors_research_projects/1263

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The Effects of Music Therapy on Older Adults with Dementia: A Systematic Review

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This paper is in partial fulfillment of Graduating with Honors in the Williams Honors College.

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Abstract

Older adults with dementia experience difficulties throughout the progression of the disease, including decreased quality of life and mental health. Nonpharmacological interventions, such as music therapy and music listening, may be one solution to affect mental health outcomes in this population. The two authors seek to answer the following PICOT formatted question: In older adults, ages 65 and older, with dementia, how does music therapy, compared with treatment as usual, affect depression and anxiety? Twenty primary sources, published from 2014 to 2019, were reviewed and critically appraised. The sources varied on country of origin, design, methods, and results. Across studies, findings were inconsistent with some supporting that music therapy or music listening increased quality of life and decreased depression, anxiety, and agitation, while others did not. Some limitations included lack of inter-rater reliability, differences in standardized care across study sites, and varied number of intervention sessions. The twenty studies were determined to have adequate internal and external validity; however, reliability was inconsistent. Overall, findings about the effect of music therapy were mixed, and it is recommended that more research should be conducted to verify its usage as evidence based practice for persons with dementia.

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As the average life expectancy in the United States increases, degenerative brain diseases, such as dementia, also increase (Thornley, Hirjee, & Vasud, 2016), which is a problem because behavioral and psychological symptoms, such as depression, anxiety, and agitation develop in those with these diseases. Depression is very commonly associated with dementia and may impact the quality of life. Depression in people with dementia may arise due to memory loss, loss of independence, and increased social isolation (Ray & Götell, 2018). Given the rising prevalence of neurodegenerative diseases, the World Health Organization (WHO) has determined that dementia is projected to affect approximately 65.7 million people worldwide by the year of 2030 (Thornley et al., 2016). As of 2016, over 5 million Americans were diagnosed with dementia, (Anderson, Kwak, & Valuch, 2018), making this a very prevalent and common disease.

As stated, dementia is a degenerative disease of the brain that lacks a cure (Thornley et al., 2016). Therefore, the goal of care is to mitigate, manage, and alleviate the symptoms that accompany this disease. Behavioral and psychological symptoms of dementia (BPSD) affect up to 90% of older adults with dementia, which significantly increases adverse clinical outcomes, such as a more rapid cognitive decline, greater impairment of activities of daily living, increased hospitalization, early institutionalization, and increased mortality (Hsu, Flowerdew, Parker, & Odell-Miller, 2017). The primary method to manage BPSD is through pharmacological means, typically through the use of haloperidol and thioridazine, which are anti-psychotic medications associated with cerebrovascular events and death in older adults (Anderson et al., 2018). This approach to alleviating BPSD may be ineffective and contribute to harmful side effects and drug-drug interactions, making it imperative to identify and implement alternative methods to alleviate BPSD in those with dementia. By implementing effective nonpharmacological therapies, there

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may be a reduced need to administer pharmacological treatments, therefore reducing the side effects and drug-drug interactions and improving overall quality of life. Examples of nonpharmacological music-related therapies used in those with dementia include music therapy, community singing groups, and individual music listening (McDermott et al., 2014). Given the severity of the cognitive impairment associated with dementia, as well as costs and ability for nurses or caretakers to implement these therapies, this paper will focus solely on the use of music therapies in those with dementia.

When it comes to music therapy, there are two primary approaches, music therapy (MT) and music listening (ML). MT is the systematic utilization of rhythmical and melodic musical instruments in order to communicate, convey emotions, enhance self-adaptation within an environment, promote a sense of a renewed identity, and stimulate overall cognitive functioning (Shiltz et al., 2018). While MT must be executed by a certified music trainer, ML does not require a trained music therapist, as it is more passive (Shiltz et al., 2018). An example of ML would be the implementation of personalized playlists (Garrido et al., 2018), which may be overseen by a nurse or caregiver.

With this focus, this systematic review will review and critically appraise the evidence regarding the effects of music therapy and music listening on depression and anxiety in older adults, ages 65 and older, with dementia. The following PICOT question will be answered: In older adults, ages 65 and older, with dementia, how does music therapy, compared with treatment as usual, affect depression and anxiety? This review is significant to nursing because due to the rising population of older adults, especially those with dementia, it may be fairly common for health care professionals to care for patients with this diagnosis (Shiltz et al., 2018).

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Methods

An initial search was conducted through online health research databases, such as PsycINFO, CINAHL Plus with Full Text, Health Source: Nursing/Academic Edition, MEDLINE with Full Text, Music Index, and Psychology and Behavioral Sciences Collection. While multiple databases were utilized, only PsychINFO and Psychology and Behavioral Sciences Collection yielded relevant primary sources. Search key terms included: “music therapy AND dementia”, “music therapy AND dementia AND depression”, “dementia AND music therapy”, and “dementia AND music therapy AND mental health”. Criteria for inclusion included published in the past five years, peer reviewed, reputable professional journals, samples of persons aged 65 and older, diagnoses of mild to severe dementia, and dependent variables of mental health, quality of life, depression, and anxiety. Studies were not excluded based on race, ethnicity, site (international and domestic), findings, and age, as long as inclusion criterion were met on age. The results of the search were thoroughly reviewed. A second search was conducted using Google Scholar, and the same inclusion criteria were applied. After reviewing all relevant articles, twenty were ultimately selected. Biased studies and studies that included other forms of alternative therapy, such as art therapy, were excluded from this systematic review. See Appendix A for a PRISMA chart describing the search and selection results.

Review of Literature

Description of studies. All 20 studies are primary sources, and half (n=10) are randomized controlled trials (RCT's), which generates an evidence level of II. Additional designs included qualitative studies, quasi-experimental, non-experimental and exploratory studies, and mixed, qualitative and quantitative. Levels of evidence generated across studies ranged from II to IV. Level I generates the strongest level of evidence, which includes, for

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example, systematic reviews of multiple RCT's. Level II generates a fairly strong level of evidence, but it usually results from a single RCT. Level III generates a moderate level of evidence, and can include quasi-experimental studies, comparative studies, and the like. Level IV generates a low level of evidence and includes case-control studies.

Out of the selected 20 primary sources, 16 were conducted using multiple sites of study (Cheung et al., 2016; Anderson et al., 2018; Garrido et al., 2018; Särkämö et al., 2014; Wang et al., 2017; Raglio et al., 2015; Ray & Mittelman, 2017; Thomas et al., 2017; Werner et al., 2017; Shibazaki & Marshall, 2017; Chu et al., 2014; Gallego & Garcia, 2017; Hsu et al., 2015; Kendra & Götell, 2018; Hsu et al., 2017; McDermott et al., 2014). Four used a single site (Giovagnoli et al., 2018; Shiltz et al., 2018; Osman et al., 2016; Thornley et al., 2016). Studies took place in residential care facilities, nursing homes, extended care facilities, day activity centers, inpatient centers, outpatient centers, veteran homes, and National Health Service care homes. Sample size ranged from 16 to 25,716 persons. The studies were conducted in a large array of countries, including the United States of America, China, Australia, Finland, Taiwan, Italy, United Kingdom, Germany, Spain, Canada, Denmark, Netherlands, Norway, and Poland. Two studies did not include where the study was conducted by not explicitly stating what type of facility was utilized (Giovagnoli et al., 2018; Osman et al., 2016).

Findings. Out of the 10 RCT's, five concluded that music therapy did significantly improve the outcomes of persons living with dementia, focusing on the areas of depression, anxiety, and agitation. Two of these RCT's used music listening (Särkämö et al., 2014; Shiltz et al., 2018) and three of these RCT's used music therapy (Chu et al., 2014; Giovagnoli et al., 2018; Werner et al., 2017). For example, Shiltz and colleagues analyzed 92 residents in an extended care facility in Indianapolis, Indiana. Forty-five residents received usual care and 47 residents

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received usual care plus passive music listening, which was determined to be effective in reducing agitation in older adults with dementia (Shiltz et al., 2018). These findings are consistent with those of Särkämö and colleagues (2014) who analyzed the impact of music activities on a group of 89 residents diagnosed with mild to moderate dementia; intervention activities included singing and music listening, compared to receiving usual care. They found that music activities had a positive impact on maintaining cognitive abilities, enhancing mood and overall quality of life (Särkämö et al., 2014).

In another RCT, Giovagnoli and colleagues demonstrated negative findings in that adding music therapy to pharmacotherapy had no effect on language and verbal communication outcomes in those with Alzheimer's, but positive findings related to improving psycho-behavioral profile. This study compared two groups. One group only received cholinesterase inhibitors (AChEI) and memantine (M) and usual care, and one group received AChEI and M combined with music therapy. Researchers are hopeful that their findings and future research will support music interventions as an effective non-pharmacological treatment for older adults with dementia, even augmenting effects of pharmacological treatment or decreasing use of pharmacology when pharmacological treatment cannot be eliminated in this population (Giovagnoli et al., 2018).

In comparison, several randomized controlled trials did not demonstrate significant changes in persons with dementia undergoing music therapy (Anderson et al., 2018; Cheung et al., 2016; Garrido et al., 2018; Raglio et al., 2015; Thornley et al., 2016). These studies also share the similarity of being foreign studies. Three of these RCT's focused on music listening as an intervention (Anderson et al., 2018; Cheung, et al., 2016; Garrido et al., 2018). For example, one RCT implemented personalized playlists as a music intervention to alleviate the behavioral

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symptoms of dementia in 99 residents of extended care facilities. The findings determined that personalized playlists are insufficient in ensuring positive outcomes of persons with dementia (Garrido et al., 2018). These findings are consistent with Cheung and colleagues (2016), who conducted a study of 156 persons with dementia, splitting these individuals into three groups of 52 participants and comparing individual music listening, music-with-movement, and usual care. The findings indicated that overtime, the outcomes of music interventions are insignificant in comparison to usual care (Cheung et al., 2016).

Additional non-RCTs finding positive outcomes with music therapy or listening included quasi-experimental exploratory studies demonstrating significant changes in psychological symptoms in persons with dementia as a result of music therapy (Kendra et al., 2018; Ray et al., 2017). These findings are in line with those of others (Gallego et al., 2017; Thomas et al., 2017; Wang et al., 2017), who also reported significant changes, as well as an empirical and quantitative study that demonstrated significant positive changes in persons with dementia undergoing music therapy (Thomas et al., 2017).

Similarly, in a mixed study using qualitative and quantitative methods, Hsu and colleagues (2015) reported significant changes in persons with dementia being treated with music therapy for behavioral and psychological symptoms associated with the neurodegenerative disease. In total, 128 residents (60 residents from Home 1 and 68 residents from Home 2) were randomly selected to determine if individualized music therapy positively affected the symptoms of dementia. In terms of well-being, the music therapy group experienced an increase in well-being from baseline to month 7. The standard care group, in contrast, experienced a decrease in well-being from baseline to month 7. Carers of those with dementia also reported a positive experience with regards to the intervention, stating an enhancement in communication and

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relationship with the residents. Additionally, the qualitative data revealed a positive impact on care staff when they viewed videos depicting an array of music therapist-resident interactions. Thus, the staff felt motivated to utilize the knowledge and concepts from the videos with regards to symptom management for persons with dementia. In conclusion, the results suggest that individualized music therapy benefits the overall well-being and alleviates symptoms of dementia (Hsu et al., 2015).

Three of the 20 studies were qualitative (McDermott et al., 2014; Osman et al., 2016; Shibazaki & Marshall, 2017). These studies explored experiences of music therapy in persons with dementia. McDermott et al. (2014) identified six key themes, in which themes 1-3 described the musical experiences, themes 4 and 5 described the effects of the musical experiences, and theme 6 described the evaluation and communication regarding outcomes (McDermott et al., 2014). Osman's study also identified six themes, including social inclusion and support, a shared experience, positive impact on relationships, positive impact on memory, lifting the spirits, and acceptance of the diagnosis (Osman et al., 2016). Lastly, Shibazaki's study identified five themes from the data, including client preferences and behaviours, music and disability, musical knowledge and the evidence of cognitive activity, staff perspectives, and visitors and families (Shibazaki & Marshall, 2017). These three studies show how music therapy can go beyond affecting the symptoms and apparent behaviors that accompany dementia and have a lasting positive effect on many aspects in individuals' lives.

Limitations. Limitations in these studies include small samples, shorter and varied intervention periods, patients with dementia that may have been too far advanced to demonstrate valid results, no comparisons of different types of dementia, inability to ensure quality of implementation across multiple facilities, reliance on busy staff members to monitor changes of

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music interventions in participants, the use of proxy reports for data collection, lack of long-term follow-ups to ensure lasting effects of music therapy, and lack formal control groups.

Information on designs, levels of evidence, settings, sample sizes, and measures can be located in the table of evidence in Appendix B.

Critical Appraisal

Limitations of findings. Research findings are often limited in validity, reliability, or applicability (Schmidt & Brown, 2019). Validity refers to how solid the research is with regards to the design and methods of the research, e.g., the degree of certainty that changes in one variable were actually caused by another variable, rather than by extraneous variables. Reliability refers to the repeatability of a study, in which methods or a measure are reliable if it produces the same results again. Applicability refers to the generalization of the results in a specific similar clinical setting. Although study validity, reliability, and applicability will be described in the next sections of this paper, examples of limitations across studies include lack of integrity (Anderson et al., 2018; Hsu et al., 2015; Thomas et al., 2017), lack of inter-rater reliability (Anderson et al., 2018), differences in standardized care across study sites (Raglio et al., 2015), and fewer intervention sessions (Chu et al., 2014; Gallego et al., 2017; Kendra & Götell, 2018; Raglio et al., 2015; Ray & Mittelman, 2017; Thornley et al., 2016). Other limitations included lack of extraneous variable control (Kendra & Götell, 2018; Thomas et al., 2017) small sample sizes (Hsu et al., 2015), and lack of instrument validity (use of the Global NPI score as the primary outcome) (Raglio et al., 2015).

Internal and External Validity of Methods

Internal validity is the extent for which a study can establish a cause and effect between the treatment and the outcome of the intervention. A good internal validity establishes that the

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outcome was due to the treatment, and not due to another variable. Therefore, internal validity relates to the methods of a study. In order for a study to improve its internal validity, the researchers may randomly assign participants to either the intervention or control group, as well as use blinding. A few factors that threaten the internal validity include maturation (such as the participants growing wiser with maturity – adolescents or young adults, growing older, or becoming tired), history (an unexpected occurrence that could affect study methods and eventual findings) and attrition (participants dropping out of the study).

External validity is the generalizability of the findings or outcome, in other words, how well the outcome can be applied to other settings, samples, and times. Similarly to internal validity, external validity also relates to a researcher's method. To improve external validity, researchers may include inclusion and exclusion criteria when selecting participants, and they may conduct the experiment in a natural setting or multiple settings, rather than in a controlled laboratory. A few factors that threaten external validity can include selection bias (such as a certain group lacking motivation to partake in the intervention) and situational factors (such as the location or noise levels).

In spite of the limitations, the reviewed 20 studies overall have adequate internal and external validity. Fifty percent of the studies (n=10) were randomized controlled trials, resulting in a level of evidence of II. RCTs have increased internal validity because they include an intervention group, control group, and randomized group assignment, which may decrease threats of maturation and history. Researchers often run analyses to compare groups to determine if they are similar even with random group assignment. Eighty percent of the RCTs (n = 8) ran comparison group analyses of patient baseline characteristics and demographics, determining pre-intervention group similarities (Anderson et al., 2018; Cheung et al., 2016; Chu et al., 2014;

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Giovagnoli et al., 2018; Raglio et al., 2015; Särkämö et al., 2014; Thornley et al., 2016; Werner et al., 2017) An additional forty percent of the studies (n=8) generated levels of evidence of III, and the remaining twenty percent (n=2) generated level of evidence of IV. Researchers of all studies thoroughly explained the primary concern and reason for the study, interventions, and designs (what would be compared), inclusion and exclusion criteria for participants, outcome measurements, statistical analyses, results of the study, a discussion, limitations and future recommendations. This supports replication of studies. Researchers of a few of the studies (n=4) conducted a priori power analysis to determine an adequate sample size, and all levels of statistical significance were set at $p < .05$. However, the greatest limitation noted collectively for the 20 studies was small samples. Having a large sample size is imperative in order to generalize the valid findings to the larger dementia population. Only one study had a sample size greater than 1,000 participants, in which the researchers recruited 25,716 persons (Thomas et al., 2017). Due to the small samples, statistical conclusion validity varied across studies. Small samples may only yield results for the small group that was tested, and therefore the findings may not be applicable to the wider population due to a statistical significance not being achievable or the occurrence of type I or type II errors (false positives or false negatives). Most samples were representative of the wider dementia population, as different types of dementia were studied and accounted for with analysis e.g., mild to severe dementia. This allows for the results to be generalized, which is related to external validity. However, researchers of a few studies did not account for the different types of dementia (Kendra & Götell, 2018; McDermott et al., 2014; Särkämö et al., 2014; Shibazaki et al., 2017; Shiltz et al., 2018). For example, Shiltz et al. (2018) only utilized those with moderate to severe dementia (2018).

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The internal validity threat of attrition, or mortality, was described in a few of the studies (Cheung et al., 2016; Chu et al., 2014; Hsu et al., 2017; Raglio et al., 2015). For example, Cheung et al. (2016) reported that only 7 participants out of 156 dropped out, resulting in an attrition rate of 12.3%. They noted how similar studies involving dementia patients also had a comparable attrition rate, ranging from 6.7% to 20.8%. Thus, they concluded that, "...the MM intervention is both a feasible and welcomed intervention" (p. 312). On the other hand, Raglio et al. (2015) reported an attrition rate of 18% with 22 of the 120 participants dropped out, thus reducing validity. Higher attrition or dropout rates may correlate with the absence of a statistically significant difference between the groups and may decrease statistical conclusion validity as well as interval validity. However, researchers often run analyses on data from those who dropped out to compare them to those who remained in the study. While none of the researchers described doing this, the researchers gave reasons as to why some participants dropped out. These included hospitalization, moved facilities, disliked group activities, refused assessment, etc. Across the studies, only the four researchers mentioned above reported attrition rates. This is important because it has implications on validity of studies. Attrition is important because dropout rate should be taken into account when it comes to clinical practice (Raglio et al., 2015). Because attrition can adversely affect internal validity, researchers often oversample, knowing that there will be some attrition (Chu et al., 2014).

With respect to blinding to enhance internal validity, only researchers of three studies included this method. In Raglio's study (2015), the evaluators, who interviewed the formal caregivers regarding the condition of the person with dementia, were blinded to the treatment type when interviewing persons with dementia or family members. Cheung et al. (2016) included trained research assistants that were blinded to the group allocation. Giovagnoli et al. (2018)

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stated that the patients were evaluated blindly by a neuropsychologist. The lack of blinding methods severely diminishes the internal validity of the studies.

With respect to external validity, multiple studies specifically selected dementia types rather than include all types of dementia. For example, Shiltz et al. (2018) only focused on moderate to severe dementia, regardless of etiology. Särkämö et al. (2014) excluded the early stages of dementia, and Chu et al. (2014) noted that a broader sample could have been drawn from the community and day care centers for PWDs. Kendra & Götell (2018) only included those with mid-stage dementia, while McDermott et al. (2014) excluded patients with mild to moderate dementia. Because of this, findings cannot be generalized to include all types of dementia in the wider population.

A few of the studies included inclusion and exclusion criteria in order to narrow down the participants and control for extraneous variables. Unfortunately, when a sample is too specific, this limits the generalizability of the findings. An example of this is Cheung et al. (2016) who listed inclusion criteria of ages 65 and above, diagnosed with any type of dementia, in stable medical condition and able to participate, able to understand Cantonese and follow directions, and suffering from anxiety as indicated by the RAID scale. Exclusion criteria included those who disliked group music and social activities, and those with uncorrectable visual and auditory impairments (Cheung et al., 2016). Werner et al. (2017), however, intentionally left the inclusion and exclusion criteria broad in order to be in line with pragmatic trials, which assess the effectiveness of interventions in a natural setting. The researchers only excluded those who were in short-term care (less than 4 weeks) and those who were bedridden (Werner et al., 2017).

Reliability of Methods and Findings

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Reliability of methods and findings is how consistent a method or a finding is, in other words, if the research was repeated using the same conditions, the results would be the same. Results from the 20 primary sources revealed inconsistencies in their methods. A major inconsistency was the way the music therapy was delivered in interventions. Across studies, music therapy was operationalized as music with movement program (M&M), (Cheung et al., 2016), individual music listening (IML) as well as M&M, (Anderson et al., 2018), personalized patient-preferred playlists (Garrido et al., 2018; Shiltz et al., 2018), and live music concerts (Shibazaki & Marshall, 2017). Although many researchers compared pre-intervention and post-intervention group data, others compared post-intervention group data (between three groups: usual care, singing group, and music listening group (Särkämö et al., 2014). Undeniably, researchers of each of the 20 studies conducted the research in diverse ways. Because music therapy encompasses a wide variety of interventions, the researchers decided what version of music therapy would be best for their particular study and sample, which complicates comparing findings across studies.

To collect the data, researchers used a variety of tools to measure the outcomes. The majority of the studies utilized more than one measurement tool to increase the reliability of the results. For example, Cheung et al., (2016) utilized six tools, including the RAID scale, Geriatric Depression Scale, MMSE, Fuld's Object Memory Evaluation, Modified Fuld Verbal Fluency Test, and the Digit Span Test. Ray & Mittelman (2017) utilized four measurement tools, including The Cornell Scale for Depression, The Algate Wandering Scale, The Cohen Mansfield Agitation Inventory, and The FAST. In contrast, Werner et al., (2017), used only one tool, the MARDS, but noted adequate tool reliability (Cronbach's alpha = 0.86).

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Although there were some inconsistencies in study findings and variations in music interventions, 70% of studies (n=14) found that music therapy is a safe and non-invasive tool to help alleviate depression and anxiety and improve quality of life (Cheung et al., 2016; Chu et al., 2014; Gallego & García, 2017; Hsu et al., 2015; Kendra & Götell, 2018; McDermott et al., 2014; Osman et al., 2016; Ray & Mittelman, 2017; Särkämö et al., 2014; Shibasaki & Marshall, 2017; Shiltz et al., 2018; Thomas et al., 2017; Wang et al., 2017; Werner et al., 2017). Of these, Osman et al. (2016) and Hsu et al. (2015) found increased well-being of caregivers in addition to those with dementia. In addition, others directly accounted for psychotropic medications in their samples, e.g., two studies explored the effect that music therapy had on psychotropic medication usage, hypothesizing that medication dose would decline. Shiltz et al. (2018) found that no significant changes in medication frequency or dosage occurred throughout the study, and thus concluded that music therapy should be used as an adjunct to a pharmacological approach, whereas Thomas et al. (2017) found a reduction in usage of antidepressant and anxiolytic medications, as well as a reduction in those at M&M facilities, compared with other treatment-as-usual facilities.

These findings are contrary to those of 20% of the studies (n=4) where researchers found little to no evidence that music therapy improved depression and anxiety in dementia patients (Anderson et al., 2018; Garrido et al., 2018; Raglio et al., 2015; Thornley et al., 2016). Garrido et al. (2018) concluded that music therapy may only provide a distracting benefit to those with dementia. In an acute psychiatric inpatient setting, Thornley et al. (2016) concluded that music therapy is not superior to active engagement for the patients.

Synthesis of the Evidence

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The majority of studies explored the impact of active music therapy for persons with dementia. The following paragraphs will review study findings. Särkämö et al. (2014) found a highly significant short-term effect of reduced depression and improved mood for singing group and music listening group, compared to the usual care control group ($p = .001$). Wang et al. (2017) utilized the MMSE and found a statistically significant difference between the experimental and control groups ($p = .048$). Ray & Mittelman (2017) found a significant reduction in depressive symptoms following musical intervention ($p < .001$). Werner et al. (2017) compared music therapy group and group singing. The study found that depressive symptoms decreased in music therapy (-2.47) and increased in group singing (+2.04). Thus, it was concluded that music therapy is more beneficial in decreasing depressive symptoms in dementia patients than recreational singing (2017). Chu et al. (2014) found that group music therapy may be appropriate for those with mild and moderate dementia, as the Cornell Scale for Depression and Dementia decreased in the experimental group from 17.39 to 11.47, indicating a reduction in depression.

Only one study utilized live music concerts as a form of music therapy. Shibasaki & Marshall (2017)'s qualitative study noted that the concerts increased levels of cooperation, interaction, and conversation for both the dementia clients and the nursing staff. As this is only the beginning of exploring live music concerts for dementia, more studies are needed to confirm its appropriateness.

Four studies utilized individualized music listening instead of group music activities. Anderson et al. (2018) utilized two phases. Phase 1 included treatment-as-usual in addition to the M&M intervention for 6 weeks and then a 2 week washout period, and phase 2 included only treatment-as-usual for 6 weeks. The study found that no effects of M&M were significant for

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phases 1 and 2. Therefore, the results indicated that M&M had little to no effects on improving agitation, mood, and decreasing medication. Garrido et al. (2018) found that sadness had increased in those with depression, and those with low anxiety were also more likely to experience increased sadness if they also had high depression. Therefore, the researchers concluded that personal music is not sufficient to ensure positive outcomes (2018). Raglio et al. (2015) found no significant differences between music therapy or listening to music in addition to standard care. Thomas et al. (2017) found that there were no statistically significant differences in mood between M&M and comparison facilities. Very little research has been conducted on the use of individualized music listening, and therefore more studies must be conducted to explore its usage.

Five studies included the use of psychotropic and anxiolytic medications (Anderson et al., 2018; Shiltz et al., 2018; Thomas et al., 2017; Thornley et al., 2016; Giovagnoli et al., 2018). Of these, Anderson et al. 2018 found that there was no statistically significant change in agitation, mood, or medication. Likewise, Shiltz et al. 2018 found that antipsychotics nor time influenced depression in the usual care group (all $p > .37$), however the interaction between Group, Antipsychotics, and Time neared significance ($p = .066$). On the other hand, Thomas et al. (2017) found that antipsychotic discontinuation increased in M&M facilities from 17.6% to 20.1%, whereas the discontinuation level in comparison facilities remained relatively stable, from 15.9% to 15.2%. Giovagnoli et al. (2018) found statistically significant results for the memantine + music therapy group, as depression decreased compared to drug therapy alone ($p = .039$). More studies are needed to explore the effect of music therapy on medication for persons with dementia.

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Based on the current state of evidence, the research shows mixed findings when it comes to the use of music therapy for depression and anxiety in those with dementia. Currently, the research evidence is not enough to support the use of music therapy to affect depression and anxiety as evidence based practice in clinical settings. However, most researchers agree that the addition of music therapy does not cause harm to the patients. Only Garrido et al. (2018) found that music can increase sadness and agitation in persons with dementia. Before music therapy can be introduced as evidence based practice, researchers must consistently verify that it reduces depression and anxiety in persons with dementia. Because of its cost-effectiveness and the positive impact it can have on patients, music therapy may be a promising technique as it is further explored.

Recommendations

Based on the evidence and critical appraisal, our recommendations include future research to be conducted with large-scale RCTs, including a larger sample size and for longer periods of time. Additionally, importance must be placed on establishing the connection between the use of music therapy and antipsychotic and anxiolytic medications, as many patients with dementia utilize at least one pharmacological agent. Importantly, more research is needed for music therapy on an inpatient basis. Finally, the evidence suggests that music therapy is safe and cost-effective, but researchers should use a single or standardized form of music therapy in order to generalize findings.

Only a few researchers have made recommendations for clinical practice. Of these, Kendra and Götell (2018) suggested that music therapy can be started by a music therapist to achieve primary goals, and then transfer instruction and facilitation to a caregiver, whether that be a nurse or a family member. Chu et al. (2014) recommended that group music therapy is an

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appropriate intervention for those with mild to moderate dementia, but not severe dementia.

Instead, the authors suggested that individual activities are more appropriate for severe dementia because of the stimulation restriction that many of those patients require. On the contrary, Thornley et al. (2016) recommended that music therapy is not the most beneficial when it comes to clinical practice on an inpatient acute psychiatric unit, where some patients may have forms of dementia. The authors stated, “It is realistic to offer MT to patients with BPSD [behavioral and psychological symptoms of dementia] on a busy inpatient psychiatry unit; however, our pilot data suggest that it may not be superior to active engagement” (p. 870).

In terms of recommendations for future research, it was recommended that future researchers should include different types of dementia (Anderson et al., 2018; McDermott et al., 2014), explore how individualized music programs affect dosages and frequencies of medications (Shiltz et al., 2018), and include more specific and appropriate tools to evaluate psychological and behavioral symptoms (Cheung et al., 2016; Raglio et al., 2015). Additionally, future studies should include a wider range of socioeconomic status, racial groups, and larger samples (Chu et al., 2014; Ray & Mittelman, 2017). Werner et al. (2017) recommended that future studies also look into the long-term effects of music therapy, including medication levels. Future research could examine the effects of music therapy for bedridden residents. Hsu et al. (2015) identified that regarding music therapy itself, the actual working mechanisms still need scientific investigation. Shibasaki & Marshall (2017) suggest that studies should investigate the increasing costs of dementia care and the way non-pharmacological interventions can contribute to the process of caring.

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Werner, J., Wosch, T., & Gold, C. (2017). Effectiveness of group music therapy versus recreational group singing for depressive symptoms of elderly nursing home residents: pragmatic trial. *Aging & Mental Health*, 21(2), 147–155.

<https://doi.org/10.1080/13607863.2015.1093599>

Appendix A



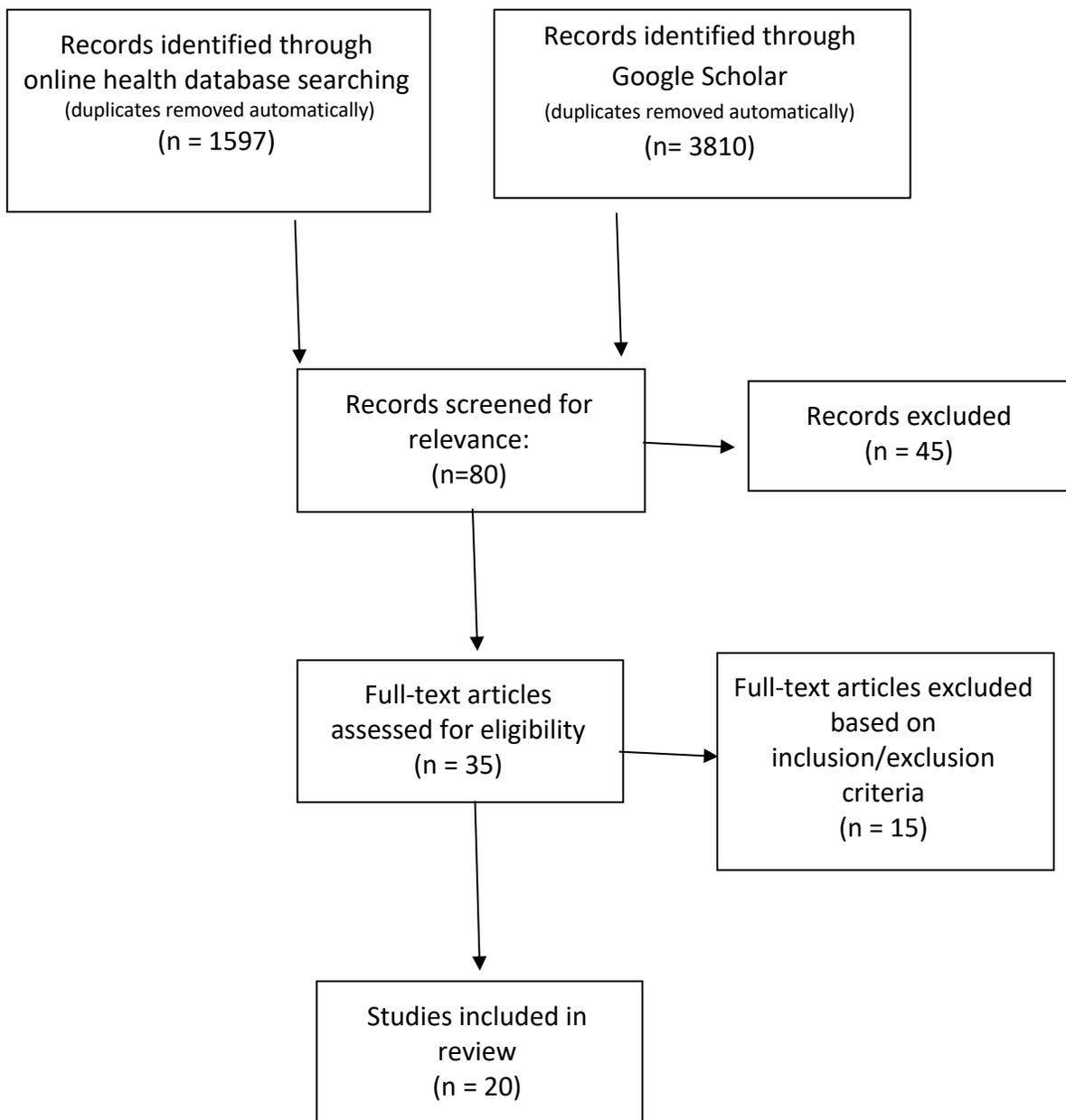
PRISMA Flow Diagram

Identification

Screening

Eligibility

Inclusion



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit www.prisma-statement.org.

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Appendix B

Systematic Review Table of Evidence

APA formatted reference	Purpose statement. Research question ¹ .	Clinical Practice Setting, Sampling methods, Sample size ² .	Design. Level of Evidence. ³	Findings, Conclusion ⁴	Practice & Research Implications ⁵	Critical Appraisal limitations ⁶
1 Cheung, D.S.K., Lai, C.K.Y., Wong, F.K.Y., & Leung, M.C.P. (2016). The effects of music-with-movement intervention on the cognitive functions of people with moderate dementia: a randomized controlled trial. <i>Aging & Mental Health, 22</i> (3), 306-315.	<p>Purpose Statement: The aim of this study is to examine the effects of music with movement intervention (MM) compared to music listening and social activity on cognitive and behavioral functions of people with moderate dementia over time.</p> <p>Research question: Does MM, compared with ML and SA, positively impact the cognitive symptoms, as well as depression and anxiety for people with dementia?</p>	<p>Setting: Twelve residential care facilities in Hong Kong</p> <p>Sampling method: Multicenter randomized controlled trial</p> <p>Sample size: 156 participants total (52 per group)</p>	<p>Design: Randomized controlled trial</p> <p>Level of Evidence: II</p>	<p>After comparing outcomes between 3 groups (MM, ML, SA), the results were not statistically significant. The pairwise comparison of the MM group shows that it may improve memory storage and delayed memory. A pairwise comparison of anxiety showed a reduction in both the MM group and the ML group. For depression, only the MM group showed a reduction.</p>	<p>MM interventions and music listening programs are safe and acceptable for enhancing cognitive functions and affective states to improve overall quality of life. It is suggested that other instruments be used to capture depressive symptoms.</p>	<p>Inability to recruit individuals in the control group for baseline. The intervention reduced anxiety and depression and enhanced cognitive functions confirmed in the MM group. Attrition rate was 7 participants. Use of convolutional neural networks. The authors' collection to the outcome reliability.</p>
2 Anderson, K., Kwak, J., & Valuch, K.O. (2018). Findings from a prospective randomized controlled trial of an individualized	<p>Purpose Statement: To examine the impact of the music and memory (M&M) intervention based on the evaluation of agitation, behavioral symptoms, and the use of psychotropic medications.</p>	<p>Setting: 10 nursing homes in four Southeastern Wisconsin counties</p> <p>Sample method: Stratified random sampling from 10 out of the 18 nursing homes.</p>	<p>Design: RCT</p> <p>Level of evidence: II</p>	<p>The condition by time in phase 2 was significant for depression, indicating an increase in Condition 1 (treatment as usual) and a decrease in Condition 2 (M&M).</p>	<p>Future researchers should use a targeted approach, such as different types of dementia, in order to generalize these findings. The study should be time sensitive and data</p>	<p>The sample size has been larger than statistical significance. The study showed increased observations of last intervention. The implementation varied from so it is unclear</p>

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<p>d music listening program for persons with dementia. <i>Journal of Applied Gerontology</i>, 1-19.</p>	<p>Research question: Is the individualized music listening program (IML) or M&M program effective in improving the quality of life in people with dementia?</p>	<p>Sample size: 59 participants total</p>		<p>No effects of M&M were significant for phases 1 and 2. M&M had little to no effects on improving resident outcomes in the areas of agitation, mood, and decreasing medication.</p>	<p>collection should be designed to observe moments of improved moods. Furthermore, future research should include specific methods regarding individualized selection of music, and measurement of the dose and frequency of the program. Researchers should also consider the use of qualitative data.</p>	<p>frequency of was used ap Lastly, there decrease in busy staff m observe and reliable and patient outc therapy, thu reliability ar</p>
<p>3 Shiltz, D.L., Lineweaver, T.T., Brimmer, T., Cairns, A.C., Halcomb, D.S., Juett, J... Plewes, J. (2018). Music first: an alternative or adjunct to psychotropic medications for the behavioral and psychological symptoms of dementia. <i>GeroPsych</i>, 31(1), 17-30.</p>	<p>Purpose Statement: The aim of this study is to highlight the need for further research focused on how individualized music programs affect doses and frequencies of antipsychotic medications and associated risks for older adults with dementia. Research Question: Would the positive changes in mood and cognition from the music programs lead to a decreased reliance on pharmacological therapies?</p>	<p>Setting: Extended care facility in Indianapolis, Indiana. Sample method: Drew numbers from a fishbowl to assign to usual care and usual care with music interventions. 45 participants in the usual care group. 47 participants in the usual care with music interventions.</p>	<p>Design: RCT Level of evidence: II</p>	<p>None of the main or interaction effects reached significance for POMS depression and anxiety. The interaction between Group, Antipsychotics, and Time neared significance ($p = .066$). Antipsychotics nor time influenced depression in UC group ($ps > .37$). No significant effects emerged for UC group ($ps > .27$) and the ML group ($ps > .15$). Music therapy is proven to be an adjunct to pharmacologic approaches for people with dementia.</p>	<p>There needs to be further research into how individualized music programs may affect dosages and frequencies of medications, as well as how positive impacts of passive music listening may generalize across a nursing home environment.</p>	<p>This study of music interv active interv comparison. This study of different typ which also a to be genera a broader gr with demen The research chose to cor over a 5 mo increasing th evidence an Four subgro included, al ability to ma and draw co Finally, taki interprofess and includin from many y strengthened</p>
<p>4 Garrido, S., Stevens, C.J., Chang, E., Dunne, L., & Perz, J. (2018). Music and dementia: individualized differences in response to personalized playlists. <i>Journal of Alzheimer's</i></p>	<p>Purpose statement: The purpose of this study is to investigate the influence of depression, anxiety, apathy, and cognitive decline on affective responses to music. Research Question: How do the psychological symptoms and mental health history of the</p>	<p>Setting: Six nursing homes in NSW, Australia. Sample method: Random sampling. Sample size: 99 residents were able to participate.</p>	<p>Design: RCT Level: II</p>	<p>A significant 3-way interaction was found between Time, Depression, and Anxiety ($p = .033$). Sadness increased for those with high levels of depression. Those with low anxiety were more likely to experience increased sadness with listening to music if they also had high depression.</p>	<p>Future researchers will need to take into account the psychological history and symptoms of the individual. For example, depression will lead to slower recoveries from negative symptoms. Future studies may also investigate</p>	<p>Limited ava diagnoses fo The use of p measures of anxiety, and limitation. Many cogni questionnair many return reliability so The research hypotheses, part, all wer</p>

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<i>Disease</i> , 64, 933-941.	patient influence their affective responses to personalized playlists?			Overall, personally significant music may not be sufficient enough to ensure positive outcomes in this population. Music may provide a distracting benefit.	from a neurological point of view, focusing on individual differences in response to music and its impact for neuro-rehabilitative effects.	The study e... subtypes of
5 Särkämö, T., Tervaniemi, M., Laitinen, S., Numminen, A., Kurki, M., Johnson, J. K., & Rantanen, P. (2014). Cognitive, emotional, and social benefits of regular musical activities in early dementia: Randomized controlled study. <i>The Gerontologist</i> , 54(4), 634–650. https://doi.org/10.1093/geront/gnt100	Purpose statement: “Our aim was to determine the efficacy of a novel music intervention based on coaching the caregivers of PWDs to use either singing or music listening regularly as a part of everyday care.” Research question: Does the use of singing or music listening regularly by caregiver’s impact symptoms of dementia?	Setting: 5 different day activity centers and inpatient centers in Helsinki and Espoo. Sampling method: voluntary participation Sample size: 89	Design: RCT Level of evidence: II	The ANCOVA showed a highly significant short term effect, indicating reduced depression symptoms and improved mood in the music intervention groups compared with the CG group ($p = .001$). Singing (SG) was found to improve performance on short term and working memory tasks immediately following the intervention. “In conclusion, the results of the present study show for the first time that regular musical activities can have an important role in maintaining cognitive ability, enhancing mood and QOL, and promoting the well-being of family members in mild/ moderate dementia.”	“An important question still pertains as to how regular musical activities could enhance the emotional and cognitive functioning of PWD.” “coaching the caregivers and nurses in using simple musical activities is an applicable and cost-efficient way for bringing emotionally and cognitively stimulating and enriching musical experiences to the lives of many elderly PWD.”	Strengths: Representat... PWD popul... The study in... and music li... compared w... Limitations: The study d... any particul... Also, it did... early stages... Lastly, the i... was short.
6 Wang, S.-C., Yu, C.-L., & Chang, S.-H. (2017). Effect of music care on depression and behavioral problems in elderly people with dementia in Taiwan: A quasi-experimental, longitudinal	Purpose statement: “The purpose was to examine the effectiveness of music care on cognitive function, depression, and behavioral problems among elderly people with dementia in long-term care facilities in Taiwan.” Research question: Does music therapy have an effect on	Setting: long-term care facilities in Taiwan Sampling method: voluntary participation Sample size: 172	Design: quasi-experimental, longitudinal research design Level of evidence: III	The experimental and control group had statistically significant differences in MMSE ($p = .048$). For changes in the CDSS, there were no statistically significant differences between the groups ($p = .688$). For changes in the CAPE-BRS, the two groups had statistically significant differences ($p < .01$). “These findings provide information for	For further studies, KMC should be designed with interventions that focus on treatment passivity.	Strengths: Large samp... 24 week stu... Applied Bar... cognition th... continuation... Included mu... collection m... observations... chart review... Limitations: - “... due to cognitive fu... behavioral a... symptom at

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study. <i>Aging & Mental Health</i> , 21(2), 156–162. https://doi.org/10.1080/13607863.2015.1093602	cognitive function, depression, and behavior problems in patients with dementia?			staff caregivers in long-term care facilities to develop a non-invasive care model for elderly people with dementia to deal with depression, anxiety, and behavioral problems.”		the experim effectiveness care cannot observed in Researchers music care r
7 Raglio, A., Bellandi, D., Baiardi, P., Gianotti, M., Ubezio, M. C., Zanacchi, E., ... Stramba, B. M. (2015). Effect of active music therapy and individualized listening to music on dementia: A multicenter randomized controlled trial. <i>Journal of the American Geriatrics Society</i> , 63(8), 1534–1539. https://doi.org/10.1111/jgs.13558	<p>Purpose statement: The aim of this study is to assess effects of active music therapy and individualized listening to music on behavioral and psychological symptoms of dementia.</p> <p>Research Question: Do music therapy and IML reduce behavioral and psychological symptoms in people with moderate to severe dementia.</p>	<p>Setting: 9 Italian institutions</p> <p>Sample method: 120 participants from nine Italian institutions randomly separated into 3 treatment groups</p>	<p>Design: RCT</p> <p>Level of Evidence: II</p>	<p>All groups showed improvement over time in behavioral symptoms, depression, and QOL. No significant differences were observed between MT or LtM in addition to SC and those who received SC alone. Addition of MT and ILM to standard care did not have a significant effect on behavioral and psychological symptoms. Effects of individualized listening to music on agitation that were observed in previous studies were not found in the present study.</p>	<p>Focus and primary outcome for future research should be restricted to more specific behavioral symptoms by selecting appropriate tools for their evaluations.</p>	<p>Using the G the primary have caused of MT to be Differences at different have impact Researchers previous stu noting incor addressed th study. Obtained w consent for participants. Standard ca exposure as results. Short study, weeks. Evaluators v PWD or fam the type of t received. High attritio dropped out Number of s too small to relationship and the mus</p>
8 Ray, K. D., & Mittelman, M. S. (2017). Music therapy: A nonpharmacological approach to the care of agitation and depressive symptoms for nursing home residents with dementia. <i>Dementia</i> :	<p>Purpose statement: “This study used an exploratory design, in which each individual was his own control, to evaluate the effectiveness of music therapy on depressive symptoms, agitation, and wandering.”</p> <p>Research question: “Will participation in small group music</p>	<p>Setting: 3 nursing homes in Brooklyn, New York</p> <p>Sampling method: convenience sampling</p> <p>Sample size: 132</p>	<p>Design: exploratory, pre-post</p> <p>Level of Evidence: III</p>	<p>Depressive symptoms decreased following musical intervention ($p < .001$), suggesting participation in 2 weeks of music therapy reduces depression and maintains the change 2 weeks posttreatment. Agitation reduced significantly immediately after the intervention ($p < .05$), therefore a 2 week intervention had</p>	<p>“Future studies should be designed to elucidate the mechanisms through which music therapy achieves success in reducing neuropsychiatric symptoms and evaluate other benefits such as improved quality of life.” It was also suggested that</p>	<p>Strengths: -“ through r large sample create group types of beh and tailor th to alleviate exhibited.” The tester d the interven have any pri with the par to protect th study. Limitations:</p>

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<p>The International Journal of Social Research and Practice, 16(6), 689–710. https://doi.org/10.1177/1471301215613779</p>	<p>therapy reduce the level of depressive symptomatology, agitation, and wandering behaviors with sustained effects for two weeks posttreatment among skilled nursing home residents with moderate to severe dementia?"</p>			<p>immediate and lingering effects on agitation. Overall, there was a significant reduction in depression, agitation, but no change in wandering.</p>	<p>further studies should be performed across a wider range of socioeconomic status and racial groups. Future studies should increase sample size to adequately assess agitation and wandering.</p>	<p>-internal validity results -not a randomized trial -Short testing only 2 weeks intervention</p>
<p>9 Thomas, K. S., Baier, R., Kosar, C., Ogarek, J., Trepman, A., & Mor, V. (2017). Individualized music program is associated with improved outcomes for US Nursing home residents with dementia. The American Journal of Geriatric Psychiatry, 25(9), 931–938. https://doi.org/10.1016/j.jagp.2017.04.008</p>	<p>Purpose statement: "The objective of this study was to compare resident outcomes before and after implementation of an individualized music program, MUSIC & MEMORY (M&M), designed to address the behavioral and psychological symptoms associated with dementia (BPSD)." Research question: Does M&M have an impact on behavioral and psychological symptoms associated with dementia?"</p>	<p>Setting: 98 nursing homes trained in the M & M program during 2013 and 98 matched-pair comparisons Sampling method: Long-stay residents with Alzheimer's disease and related dementias (ADRD) residing in M&M participating facilities (N = 12,905) and comparison facilities (N = 12,811) during 2012–2013. Sample size: N = 25,716</p>	<p>Design: empirical and quantitative study; interview Level of evidence: III</p>	<p>The difference in rates of discontinued antipsychotic and anxiolytic medication use and reduced behavioral problems was greater in M&M facilities compared to pair-matched comparison facilities. In the M&M facilities, discontinuation increased from 17.6% to 20.1% while remaining stable in comparison facilities. "These results offer the first evidence that the M&M individualized music program is associated with reductions in antipsychotic medication use, anxiolytic medication use, and BPSD symptoms among long-stay nursing home residents with ADRD."</p>	<p>"Future work to evaluate this program will consider random assignment of facilities to participate in the M&M program or to serve as comparisons and should include an implementation evaluation that allows us to characterize the residents selected by staff to participate, the delivery of the intervention, and any immediate effects that may be recognizable through residents' participation in the M&M intervention."</p>	<p>Strengths: -large sample -matched comparison -validated resident outcome measures Limitations: -underestimated examining of long-stay residents with ADRD -unable to fully address differences in affected the interest -unable to determine if residents in the intervention received the intervention -exact timing of implementation</p>
<p>10 Osman, S. E., Tischler, V., & Schneider, J. (2016). 'Singing for the brain': A qualitative study exploring the health and well-being benefits of singing for</p>	<p>Purpose statement: The current study aims to explore the experiences of people with dementia and their carers attending a group singing activity. Research question: "does group singing therapy for those with dementia</p>	<p>Setting: East Midlands area of the UK Sampling method: voluntary participation Sample size: 20</p>	<p>Design: qualitative study using semi-structured interviews Level of evidence: III</p>	<p>6 themes were identified from the data: social inclusion and support, a shared experience, positive impact on relationships, positive impact on memory, lifting the spirits, and acceptance of the diagnosis. "The findings add to a growing literature on the utility of arts-based</p>	<p>Future studies could look in more detail at the improvements reported in the sessions, for example enhanced memory could be measured using standardized tests.</p>	<p>Strengths: -includes carers -focused on experiences of those with dementia rather than scientific -the program was inclusive Limitations: -small sample -led by one person -capacity of the program was not assessed</p>

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people with dementia and their carers. Dementia: The International Journal of Social Research and Practice, 15(6), 1326–1339. https://doi.org/10.1177/1471301214556291	positively impact well-being?”			interventions in the care of people with dementia...This study supports the now well-documented claims that the perspectives of people with dementia can and should be included in research...”		
11 Werner, J., Wosch, T., & Gold, C. (2017). Effectiveness of group music therapy versus recreational group singing for depressive symptoms of elderly nursing home residents: pragmatic trial. <i>Aging & Mental Health</i> , 21(2), 147–155. https://doi.org/10.1080/13607863.2015.1093599	<p>Purpose statement: the aim of this study was to examine the effect of interactive group music therapy versus recreational group singing on depressive symptoms in elderly nursing home residents.</p> <p>Research question: Is interactive group music therapy or recreational group singing more effective for reducing depressive symptoms in elderly nursing home residents?</p>	<p>Setting: 2 German nursing homes</p> <p>Sampling method: voluntary participation</p> <p>Sample size: 117</p>	<p>Design: “The study was designed as a pragmatic two-armed, cluster randomised controlled study”</p> <p>Level of Evidence: II</p>	<p>In 10 weeks, depressive symptoms decreased in music therapy (-2.47) and increased in group singing (+2.04). Additionally, a post hoc analyses showed the effects of music therapy were greater in those with than in those without dementia ($p = 0.043$). “The results suggest that music therapy decreases depressive symptoms in elderly people in nursing homes more effectively than recreational singing.”</p>	<p>In future studies the long-term effects of interactive music therapy as long-term and fixed-term intervention with regard to quality of and medication levels would be relevant to include. Furthermore, future research of beneficial effects for bedridden residents is needed.</p>	<p>Strengths:</p> <ul style="list-style-type: none"> -large sample -data suggest more effective dementia therapy -the music therapy communication relationship residents and the study staff -the depression MADRS, had reliability -study carried out in setting, thus external validity <p>Limitations:</p> <ul style="list-style-type: none"> -imbalance of years of living in home -changes in medication -only included mobilized residents -one music therapy conducted throughout
12 Shibazaki, K., & Marshall, N. A. (2017). Exploring the impact of music concerts in promoting well-being in dementia care. <i>Aging & Mental Health</i>	<p>Purpose statement: “this study explores the specific effects of live music concerts on the clients with dementia, their families and nursing staff/caregivers.”</p> <p>Research question: “in what ways can live music concerts influence clients</p>	<p>Setting: 6 care facilities in the UK and Japan</p> <p>Sampling method: voluntary participation</p> <p>Sample size: 53</p>	<p>Design: qualitative study</p> <p>Level of Evidence: III</p>	<p>5 themes were identified – client preferences and behaviors, music and disability, musical knowledge, staff perspectives, and visitors and family. “In conclusion, we would argue that the findings from this qualitative study of musical performances</p>	<p>Given the findings of this and previous studies, the increasing costs of dementia care to society and the need to consider further the ways in which non-pharmacological interventions can contribute to the process of caring,</p>	<p>Strengths:</p> <ul style="list-style-type: none"> -only intervention afternoons to sundowning -concerts scheduled afternoons to fatigue <p>Limitations:</p> <ul style="list-style-type: none"> were voluntary the resulting to some extent individuals

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Health, 21(5), 468–476. https://doi.org/10.1080/13607863.2015.1114589	living with dementia, their caregivers and their family members.”			taking place within care facilities, provides further evidence to suggest that experiencing live music concerts provides numerous benefits to all those involved with the care of the elderly living with dementia.”	we suggest that future research in this area could be of significant benefit to all those involved in the care of the elderly.	disposed to musical activities, interviews to immediately of the conce it could be a participants enjoying ten levels of arc -only includ stage demer
13 Chu, H., Yang, C.-Y., Lin, Y., Ou, K.-L., Lee, T.-Y., O'Brien, A. P., & Chou, K.-R. (2014). The Impact of Group Music Therapy on Depression and Cognition in Elderly Persons With Dementia: A Randomized Controlled Study. <i>Biological Research For Nursing</i> , 16(2), 209–217. https://doi.org	Purpose statement: “The aims of this study were to determine the effectiveness of group music therapy for improving depression and delaying the deterioration of cognitive functions in elderly persons with dementia. Research question: Does group music therapy improve depression and decrease the deterioration of cognitive function in older persons with dementia?”	Setting: 3 nursing homes in Taiwan Sampling method: voluntary participation Sample size: 104	Design: A prospective, randomized, parallel-group design Level of evidence: II	The mean CSDD scores for the experimental group decreased from 17.39 to 11.47. The control group did not trend downward. Mild and moderate dementia was significantly improved after intervention ($p < .001$, $p = .005$ and $p = .340$ for mild, moderate, and severe). “The group music intervention is a noninvasive and inexpensive therapy that appeared to reduce elders’ depression... Group music therapy may be an appropriate intervention among elderly persons with mild and moderate dementia.” No significant difference was found in salivary cortisol levels.	“Further research is needed on the variables that did not demonstrate a significant response to the intervention, particularly regarding the levels of cortisol after group music therapy. We recommend that future studies use larger, more diverse samples and more objective outcome measures to increase the empirical understanding of the impact of music therapy.”	Strengths: -estimated s -oversample attrition -subjective/ measures -careful ran -follow-up -experienced therapist, w experience v PWDs Limitations: -short durati lasting only -lack of long -resource lin restricted str -broader sar been drawn and day care PWD
14 Gallego, M. G., & García, J. G. (2017, April 28). Music therapy and Alzheimer's disease: Cognitive, psychological, and behavioural effects. Retrieved October 27,	Purpose statement: “To determine the clinical improvement profile of Alzheimer patients who have undergone music therapy.” Research question: Does nonpharmacological interventions, such as music therapy, offer a promising alternative for improving	Setting: 2 geriatric residences in the Region of Murcia Sampling method: voluntary participation Sample size: 42 patients	Design: within-subject (experimental) Level of evidence: III	Scores for anxiety and depression subscales of the HADS improved. Depression did not improve after 6 sessions ($p > .05$). Decreases between baseline and follow up scores were not significant for any symptoms assessed with NPI ($p > .05$). “...music therapy improved some cognitive,	“Further controlled studies with homogeneous samples are necessary to support use of this technique.”	Strengths: -several met measuremen -groups wer encourage p social intera intimacy. Limitations: interpreted v to the study design.” -short study only 6 week -small samp

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2019, from https://www.sciencedirect.com/science/article/pii/S217358081730072X .	behavior and cognitive function?			psychological, and behavioral alterations in patients with AD.” “Music therapy lessened symptoms of most neuropsychiatric disorders, especially anxiety and depression” It also improved delusions and hallucinations in moderate dementia.		
15 Hsu, M. H., Flowerdew, R., Parker, M., & Odell-Miller, H. (2015, July 18). Individual music therapy for managing neuropsychiatric symptoms for people with dementia and their carers: a cluster randomised controlled feasibility study. Retrieved October 27, 2019, from https://bmjopen.bmj.com/lookup/doi/10.1136/bmjopen-2015-008244 .	Purpose statement: “...the current project aims to elucidate the interactive components of individual music therapy. In addition, it aims to contribute to the knowledge gaps within this field and explore how music therapy relates to the context of care. Research question: Does music therapy have a positive effect on symptoms of dementia, as well as caregivers?”	Setting: two care homes in the UK Sampling method: referral from staff or relatives Sample size: 60 residents from Home 1 and 68 residents from Home 2	Design: mixed methods design (qualitative and quantitative) Level of evidence: III	Dementia symptoms in the standard care group increased, but music therapy group decreased over 5 months and continued for both groups after the intervention ended. Wellbeing increased in music therapy group from baseline to month 7 and decreased for the standard care group. Carers reported a positive impact of music therapy on themselves. “The results of the study suggested potential sustained benefits on residents’ wellbeing and symptoms over the 5 month period of intervention and two month period post-intervention.”	“With modifications in the study design, the protocol warrants a more rigorous evaluation in a larger RCT.” “The future research should endeavour to satisfy similar ecological validity. The working mechanisms of music therapy sessions still await scientific investigation. The use of psychophysiological measures may illuminate the agents of change acting on residents’ internal states within sessions. This will help further clarify the clinical utility of music therapy in dementia care.”	Strengths: -long study, between February and September 2015 -included carers -staff were encouraged to participate Limitations: -small sample size -no multiple comparisons performed -no blinding -large effect size for interpretation of significance -one care home -therapy sessions -the other residents
16 Kendra, R. D., & Göttel, E. (2018, September 17). The Use of Music and Music Therapy in Ameliorating Depression Symptoms	Purpose statement: “For this study, we measure the effectiveness of a 2-weeks music therapy intervention followed by a music activity facilitated by certified nursing assistants (CNAs) trained to incorporate	Setting: 3 nursing homes in New York Sampling Method: voluntary participation Sample size: 62	Design: exploratory Level of evidence: III	Wellbeing improved slightly but not significantly for those who participated in the singing intervention ($p = .0165$). Residents depression symptoms significantly declined after 2 weeks of music therapy ($p < .001$), increased during	“Future studies should aim to analyze more than one session to compare outcomes over a period of time.” “This research may be translated into clinical settings,	Strengths: -all participants -type of dementia -the analysts -participate in -had no relationship -participants -the validity -used CSD scale -depression scale -has a high level

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and Improving Well-Being in Nursing Home Residents With Dementia. Retrieved October 27, 2019, from https://www.frontiersin.org/articles/10.3389/fmed.2018.00287/full .	singing and music-with-movement into their caregiving activities.” Research question: Does a 2-week music therapy intervention followed by a music activity effect depressive symptoms in PWD?			a 2 week washout period ($p = .389$) but stabilized following the 2 weeks music activity ($p = 1.00$). “The study interventions show an effective example of how music therapy skills can be shared to extend music's therapeutic benefits and sustain reductions of depression symptoms.”	which begins treatment with a music therapist who achieves primary goals then transfers instruction and facilitation to a caregiver.”	Limitations: -MIDAS assessment being tested -limited ability to film footage from participants -lacked formal protocol -short study only 2 weeks
17 Thornley, J., Hirjee, H., & Vasudev, A. (2016). Music therapy in patients with dementia and behavioral disturbance on an inpatient psychiatric unit: results from a pilot randomized controlled trial. <i>International Psychogeriatric Association</i> , 28, 868-871.	Purpose statement: Determine the feasibility and effectivity of MT on BPSD in patients with dementia in an acute psychiatric inpatient setting. Research Question: Is MT an effective nonpharmacologic treatment for BPSD and anxiety for people with dementia.	Setting: An inpatient acute psychiatric unit in Ontario, Canada Sample method: Random assignments to MT group or active engagement intervention using an online randomization program. Sample size: 16 participants 10 allocated to MT, 6 allocated to AEI.	Design: RCT Level of Evidence: II	A nonsignificant decrease in CMAI scores for both MT and AEI group was observed ($p > .05$). There was a subsequent decrease on the CMAI scores over the following 3 weeks. Offering MT to patients with BPSD on an inpatient psychiatry unit may not be superior to active engagement.	It is realistic to offer MT for BPSD on a busy inpatient psychiatric unit, although it does not prove to be superior to AEI. This may be due to the fact that the sample was severely affected by dementia and were unable to meaningfully engage. Additional large scale RCTs regarding MT are needed in acute psychiatric care. Future studies may benefit by being multi-centered and increasing the frequency of sessions.	Small sample size Varying duration of stay, not in a facility. MT was done on all occasions engaging in activities Short study only 4 weeks
18 Giovagnoli, A. R., Manfredi, V., Schifano, L., Paterlini, C., Parente, A., & Tagliavini, F. (2018). Combining drug and music therapy in patients with moderate	Purpose statement: To determine the effect of an integrated approach on language in comparison to M added to stable AchEI treatment. Research Question: Will the addition of AMT to a pharmacological treatment give additional benefits	Setting: 1 hospital outpatient clinic Sampling method: random selection Sample size: 45 participants	Design: RCT Level of Evidence: II	The NPI total and subscale scores revealed significant benefits in the M-AMT group for Depression ($p = 0.039$) and Appetite ($p = 0.011$) disorders after 12 weeks of treatment, and a significant between-group difference for Depression at week 24 ($p = 0.027$)	In those with moderate Alzheimer's disease, adding AMT to pharmacotherapy does not benefit language and verbal communication in comparison to pharmacotherapy alone. However, the addition of AMT to pharmacotherapy can improve the	Strengths: Long intervention weeks Patients were blinded by a neuropsychologist Limitations: Small sample size Mild language impairment High variance

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Alzheimer's disease: a randomized study. Neurological Sciences : Official Journal of the Italian Neurological Society and of the Italian Society of Clinical Neurophysiology, 39(6), 1021–1028.	compared to drug therapy alone in patients with moderate AD?			M-AMT was associated with improved psychiatric symptoms compared to drug therapy alone	psycho-behavioral profile	
19 Hsu, T., Tsai, H., Hwang, A., Chen, L., & Chen, L. (2017). Predictors of non-pharmacological intervention effect on cognitive function and behavioral and psychological symptoms of older people with dementia. Geriatrics & Gerontology International, 17, 28–35.	<p>Purpose statement: "...the main purpose of the present study was to investigate the predictors of the non-pharmacological intervention effect for old veterans with dementia and BPSD."</p> <p>Research question: Will non-pharmacological therapy reduce BPSD in veterans with dementia?</p>	<p>Setting: Two veteran homes in northern Taiwan.</p> <p>Sample method: recruitment</p> <p>Sample size: 141</p>	<p>Design: retrospective cohort study</p> <p>Level of evidence: IV</p>	<p>Depression showed a statistically significant improvement ($p = 0.015$) along with agitation ($p < 0.001$) It was also found that there was a statistically significant improvement in caregiver burden ($p < 0.001$).</p>	<p>The study showed that non-pharmacological programs can significantly reduce BPSD. Patients with more severe BPSD and depressive symptoms were more likely to gain benefit. Clinically, the findings might be applied to long term care facilities. Future research should evaluate the effect of psychotropic medication reduction by non-pharmacological intervention.</p>	<p>Strengths: Long intervention months P value set to include all stages of dementia, but moderate to severe</p> <p>Limitations: All participants No control group Included many as well (art therapy, reminiscence, orientation, Attrition rate dropped out and transferred to institutions)</p>
20 McDermott, O., Orrell, M., & Redder, H.M.(2014). The importance of music for people with dementia: the perspectives of people with	<p>Purpose statement: Develop further insights into the musical experiences of people with dementia.</p> <p>Research Question: What are the psychosocial effects from music therapy with people with dementia?</p>	<p>Setting: 2 National Health Service care homes</p> <p>Sample method: Home A: n=25 Home B: n=47</p>	<p>Design: Qualitative Study</p> <p>Level of evidence: IV</p>	<p>5 themes were identified – here and now, who are you, connectedness, effects of music on mood, and effects of music on care home environment. It was reported that music helped improve the mood of PWDs, but it tended to be short term.</p>	<p>Music seems accessible for all stages of dementia in regard to the improvement of mood and stimulation. Future studies may want to include people with moderate dementia. There is a need to study the meaning and value of music</p>	<p>The specific developing music therapy have disabled meaningfulness picked up. It is possible importance moderate dementia represented, included. The psychosocial music in dementia been empirically</p>

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<p>dementia, family caregivers, staff and music therapists. <i>Aging & Mental Health, 18(6), 706-716.</i></p>			<p>The effects of music go beyond the reduction of behavioral and psychological symptoms. Individual preference for music is preserved in people with dementia. Maintaining music can help value who the person is and increase the quality of life.</p>	<p>by incorporating the view of early to moderate dementia patients.</p>
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