

Effect of Expressive Art Therapies on the Symptoms of Alzheimer's Disease

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Abstract

In recent years, the number of Alzheimer's cases has been rapidly increasing, with no known cure. Late-onset Alzheimer's is the most common form of dementia, and in most cases, it severely interferes with daily life. In an attempt to reduce the impact this disease has cognitively and socially, expressive art therapy was taken as a non-pharmaceutical holistic treatment which has been proven to have various clinical benefits, including improved cognitive abilities and memory recollection. Three different forms of expressive art therapy were taken into consideration in this review: music therapy, visual arts therapy, and dance therapy. A total of 16 studies were assessed. While it may not always be feasible to undergo these treatments, individuals with Alzheimer's and related dementias who are able to participate have an overall positive result on their memory and quality of life.

Introduction/Background:

The global population is aging as humans live longer (Wise, 1997). Consequently, the number of people with age-related neurodegenerative diseases like dementia and Alzheimer's disease is increasing. Dementia is the overarching term to define diseases that affect an individual's memory and decision making skills to the point that it interferes with doing everyday activities (Gustafson, 1996). The most common form of dementia is Alzheimer's disease (AD). AD is a neurodegenerative disorder that starts with mild memory loss and can progress to the inability to carry out everyday tasks and respond to the environment, depending on the severity of the disease. Approximately 55 million people worldwide have AD, with approximately three fourths of cases going undiagnosed. Dementia cases are estimated to increase in the coming decades, with over 100 million total cases by 2050 (Nichols & Vos, 2021). More specifically, the number of people with clinical AD is predicted to increase by about 8 million by 2060 (Rajan et al., 2021). While AD does not have a definitively known cause, genetic changes are the most prevalent source of AD. The three variants responsible for causing AD are an amyloid precursor protein (APP) on chromosome 21, presenilin-1 (PSEN1) on chromosome 14, and presenilin-2 (PSEN2) on chromosome 1 (*Alzheimer's Disease Fact Sheet*, 2023).

Symptoms of AD include dissatisfaction with life, a loss of interest in activities (Merriam et al., 1988), constant memory loss that interferes with daily activities, worsened judgment, and the inability to complete previously familiar tasks (*What Is Alzheimer's Disease?*, 2020). AD typically falls within four stages: preclinical, mild, moderate, and severe. As the stage of the disease progresses from mild AD to severe AD, symptoms worsen (*Alzheimer's Disease Fact Sheet*, 2023). Generally, preclinical AD occurs before the brain shows signs of dementia and mild

(early-stage) AD occurs when an individual has trouble processing and understanding things around them. Once a person develops moderate AD, more intensive care is necessary due to increased memory loss and cognitive decline. Those with severe AD may become reliant on others to perform activities of daily living as their cognitive function deteriorates.

No cure has been found for AD, but pharmacological and non-pharmacological treatments have been adopted by healthcare professionals in an effort to alleviate the impact of AD on patients. An important element of patient care involves improving the happiness and well-being of those living with AD. Non-pharmacological interventions often target a patient's quality of life and health (Castellano-Tejedor, 2022), including social activities, arithmetic, art therapy, and changes in diet ("Non-Drug Interventions for Alzheimer's Disease," 2017). Expressive art therapies integrate the creative arts to prompt emotional and physical growth (Hu et al., 2021).

Expressive art therapies have three main categories: music therapy, dance therapy, and visual arts therapy. Music therapy uses music participation or listening as an intervention to promote physical, emotional, and cognitive growth (Gómez Gallego & Gómez García, 2017). Visual arts therapy is a method of creative expression using visual art to achieve personal goals. Sessions can consist of both creating art as well as observing art made by others (Hu et al., 2021). Dance therapy uses movement to improve physical well-being and cognitive function (Koch et al., 2019). All three types of expressive art therapies target different symptoms of AD, like cognitive function and memory loss. If used in tandem with pharmacological treatments, expressive art therapies could pose as an effective intervention to treat or slow the progression of AD.

The main goal when completing this review was to determine if expressive art therapies have a positive impact on the core symptoms of AD, specifically the memory loss of patients, and the quality of life of people with AD. We specifically aimed to answer the following questions: How can expressive art therapies aid in the memory recollection of patients with late-onset AD? Does a certain form of art therapy have more cognitive benefit to the patients? Does a certain form of art therapy have a more positive impact on the quality of life of patients? Could multiple art therapies used in tandem with each other form the most beneficial treatment plan for a person with AD? The impact of each therapy was looked at separately to compare the benefits of each to one another. If each therapy has a different impact on AD, then using multiple forms of expressive art therapy together in conjunction with pharmacological treatments may prove to be the best treatment plan for a person with AD.

Methods

To complete this review, studies were collected from a Google Scholar search using the search criteria = all(alzheimer*) AND all(music* OR art* OR dance* OR art therapy*) AND all(cognitive function* OR memory loss* OR associative memory* OR nostalgia). Of the results generated from this search, 16 articles were analyzed in depth to assess the impact of expressive art therapy on AD. These papers were chosen for this review due to their study design and relevance to the central topic of expressive art therapies and AD. In addition, most patients in the articles fall above the age of 65 and generally have late-onset AD, which is AD diagnosed after the age of 65. Other forms of dementia were also taken into consideration. Ancestry and descendant searches were conducted on the relevant review and empirical articles to gather as many relevant sources as possible by looking at either papers referenced within a certain article, or more recent papers that utilize information found within the article. The effect of various art therapies on the memory and cognitive function of patients were observed to make a conclusion about expressive art therapies as a probable treatment for AD.

Articles that utilized physical activity as a treatment were coded as dance therapy, studies that involved the patient creating art or viewing a form of art were coded as visual therapy, and treatment involving singing, creating music, or music listening as music therapy.

Type of Expressive Art Therapy	Number of Empirical Papers
Music Therapy	11
Visual Arts Therapy	3
Dance Therapy	2

Music therapy can include various activities, from listening to music to creating it. In a session, music therapists work with patients in either a group or an individual session and customize their activities accordingly based on the patients' preferences. When used for AD, music therapy can work to improve the associative memory of a patient when playing familiar songs, and short term memory when trying to remember a song they heard in the recent past (National Center for Complementary and Integrated Health, 2022). Music therapy can also boost the happiness and quality of life for a patient because music produces dopamine in the body, a pleasure-inducing neurotransmitter (Ferreri et al., 2019).

Visual arts therapy includes the patient either creating or viewing art. This form of therapy can be done on its own or with the aid of an art therapist. When used for AD, art therapy can improve the cognitive function of a patient when they create art on their own and also help mental health (Liu et al., 2023). Similar to music therapy, viewing and creating art can release dopamine, which can significantly improve mood and health (Zaidel, 2010).

Dance therapy involves group or individual sessions with a dance teacher or therapist where a patient does exercise or physical movement. When used for AD, dance therapy significantly benefits the cognitive and motor abilities of patients with dementia (de Natale et al., 2017). If used with music in the background, some benefits of music therapy may also apply because the individual will receive the same dopamine rush they get from listening to music.

Results

This review focuses on the impact of expressive art therapies on the quality of life and cognitive ability of AD patients.

Effects of Expressive Art Therapies on Cognitive Function and Memory Recollection

The effects of expressive art therapies on the cognitive function and memory recollection of an individual with AD was evaluated by analyzing nine studies. Out of these nine studies, most patients showed significant improvement in cognitive function, memory recollection, or both, depending on the varying methodologies used in each study. To determine which procedure was most beneficial to the patient, various subgroups within each expressive art therapy were created and analyzed separately. The findings of the study conducted by Gallego and García (2017) demonstrated that music therapy had a positive effect on the symptoms of AD. In this study, the participants listened to both familiar and unfamiliar music, and then were evaluated using the Mini Mental State Examination (MMSE). Using results from the MMSE, as shown in Figure 1 (left), they determined that, by study conclusion, all categories showed improvement. The most significant increases in score, however, were shown to be in orientation and memory. A similar procedure was used in the study done by Wang et al. (2018). This study also dealt with patients listening to music familiar to them and measured the MMSE score before, during, and after the treatment. As shown in Figure 1 (right), the mean scores of the patients' MMSE increased notably over the treatment period compared to the control group.

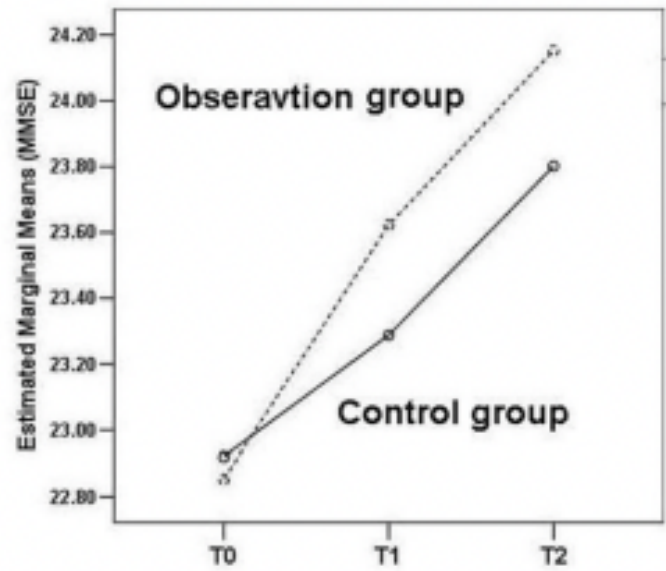
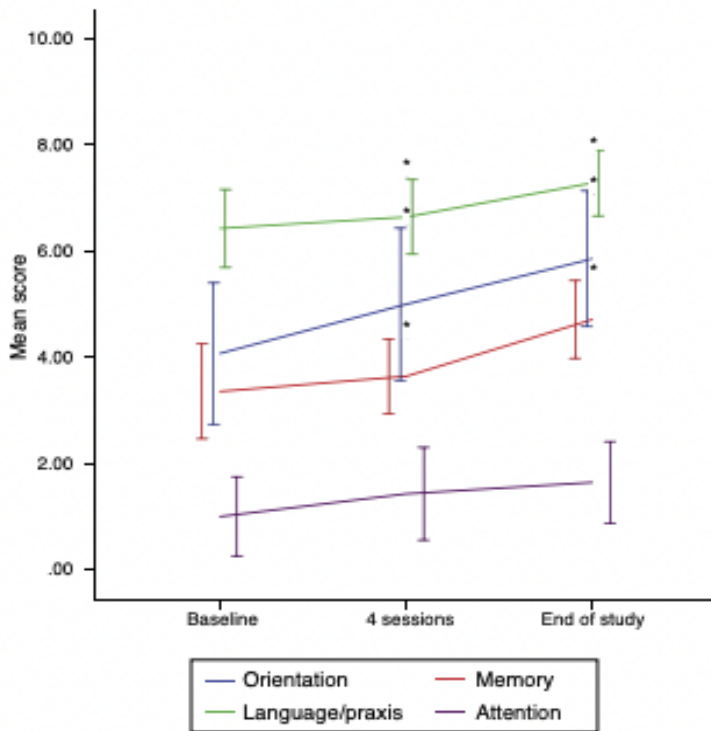


Figure 1 Changes in MMSE scores by domain.

Figure 1. Results from Gallego and Garcia (2017) and Wang et al (2018) demonstrating benefits of music therapy on MMSE.

Average Percentage of Words Recalled, by Task
Material Recalled

Subject #	Familiar Song	New Song	Familiar Spoken	New spoken
1	97.2	67.0	59.0	64.0
2	76.7	62.0	58.0	52.5
3	84.2	75.0	96.0	83.0
4	95.0	79.0	92.0	67.0
5	92.3	58.0	36.0	3.5
6	72.8	32.5	28.0	46.5
7	71.6	39.0	70.0	59.0
8	77.5	8.0	17.0	16.5
9	38.2	.9	11.3	1.3
10	12.5	.5	7.0	0.0
M	71.8	42.19	47.43	39.33

Table 1. Results from Prickett and Moore (1991) showing increased recall ability after familiar music.

The study by Prickett and Moore (1991) also tested the participants ability to remember lyrics and information while utilizing auditory stimuli that were both familiar and unfamiliar to the participant. Using both spoken and sung words, researchers tested the number of words recalled after listening to a song. The ability to recall certain information when receiving stimuli was evaluated as well. As shown in Table 1, familiar music was most easily remembered by participants. Similarly, the study by Fraile et al. (2019) created personalized music (connected to a prior memory of the individual) for patients with AD and tested their ability to remember the lyrics of the song after listening to it sung by the experimenter and singing it on their own. EFCL, a language cognitive function assessment, was used to evaluate the effects of music therapy on participants by evaluating verbal ability, memory, and executive processes. The total EFCL was used for analysis. Music therapy was found to have the most significant effect on the memory and executive function of the participants.

Another study that tested the effect of music therapy on the memory of a patient with AD is the study by Reschke-Hernández et al. (2020). In this study, there were 39 patients that participated, 20 that had AD, and 19 that were healthy. Each was given a song to listen to and

were asked to evaluate their feelings immediately after completing the song. 5 minutes after the test, they were given a memory test to see how much of the song they could recall. Within the 30 minute period after listening to the music, two more personal evaluations were done. During these evaluations, emotion ratings were converted into a percentage from 0% - 100%, based on how intense the emotions evoked were. It was found that those with AD performed lower on memory than the experimenters expected, but the emotions that they were experiencing remained consistent with the feelings of the music itself. This emphasized the idea that people with AD can experience strong emotions from brief exposure to music, supporting the idea that music could be used as a potentially therapeutic tool.

In the study done by Nektarios and Nikoleta (2021), 32 patients participated in music therapy sessions with the guidance of a music therapist. In each, patients chose an instrument to use and attempted to imitate the therapists singing/playing. A MMSE test was used to evaluate changes before and after music therapy and to determine whether the music made the patient recall anything. From this study, it was determined that the memory of music can retain within a person's memory even after their perception declines, showing that music is a unique stimulus that activates those with AD.

In the study by Hattori et al. (2011), patients colored abstract patterns with crayons and water-based paint of familiar drawings during 12-45 minute sessions. The MMSE score and Apathy Scale were used to determine if art therapy was an effective intervention. However, after evaluating these scores, they found that while some MMSE scores increased, it was not enough to show a direct relationship between visual art therapy and improvement in cognitive function.

In the study done by Matziorinis et al. (2023), 40 sessions were held weekly over a year with both music and physical activity included. Using music therapy, specifically singing lessons, the researchers evaluated the retention rates of participants with AD in the music therapy program. A control group also participated in the same forms of therapy to see if any significant changes were determined in the patients with AD. To determine the impact of music therapy on cognition, questionnaires like the World List Memory Test and stimuli from the Profile of Music Perception Skills were given to the participants. However, in the end, the researchers felt as though there were not enough participants that stuck with the music therapy to make an adequate conclusion about music therapy as a potential treatment for AD.

Parkinson's disease (PD), another form of neurodegenerative disease that can have dementia components similar to AD disease, has also been the subject of expressive art therapy. One study done by Natale et al. (2017) studied the effect of dance therapy on the motor and cognitive function of patients with Parkinson's disease. Along with the MMSE test, the experimenters used the UPDRS (Unified Parkinson's Disease Rating Scale), BBS (Berg Balance Scale) and other movement/balance tests similar to this. Compared to the group undergoing traditional rehabilitation, the group that was doing dance therapy had more improvements on the motor abilities of patients. The experimenters believe that the less significant effect traditional rehabilitation had on the patients could have been a result of that form of treatment being adapted to the length of the dance therapy sessions. This variation from

how traditional rehabilitation would take place normally may have caused this difference in effect. Additionally, PD tends to affect the motor ability of a patient more severely than cognitive ability, which may have resulted in less significant difference in the MMSE test before and after dance therapy.

Effects of Expressive Art Therapies on Quality of Life

The effects of expressive art therapies on the quality of life and mental state of an individual with AD was evaluated by analyzing eight studies. Most patients showed significant improvement in their quality of life.

In a study done by Hernández et al. (2020), participants with AD listened to personally-selected music intended to evoke strong emotions. Afterwards, participants were tested on their ability to recognize parts of the songs when given a stimulus, and self-reported their feelings on the Differential Emotions Scale (DES). While in comparison to the healthy control group, those with AD performed significantly lower on the memory recollection portion, the results showed that the emotions participants felt after listening to the music was consistent with the emotion the music was intended to evoke in listeners. This suggests that listening to uplifting music could have a positive effect on the well-being and mental health of AD patients. In a study done by Rio (2018), the effects of music therapy on individuals with AD disease and their caregivers was evaluated. Participants of this study went through various forms of music therapy in a group-based setting including both listening and creating music. As the treatment continued, the participants became more comfortable with each other, highlighting the potential that groups like these could have in improving the lives of patients with AD and their caregivers.

In the study done by Brotons and Pickett-Cooper (1996), sessions consisting of different musical activities were conducted twice a week. The 47 patients were observed by a music therapist or caregiver and the Agitation Behavior Scale and the Disruptive Behavior Rating Scale were used to assess the state of the patients before, during, and after music therapy intervention. It was found that when music activities are personalized to the patients, their agitation levels generally decrease, regardless of their musical background. This emphasized the idea that listening to music that is hand-picked to evoke certain emotions in a patient with AD can alleviate the anxiety that they may be feeling.

In the study done by Cevasco and Grant (2003), 38 sessions were held over 8 months with both music and a few movement activities incorporated into each 50 minute session. This study consisted of 14 patients, each with early to middle stages of AD. The goal of this study was to assess the amount of patient participation in various activities to see which would be most beneficial as a treatment method. While the study didn't produce precise responses, communication was developed between the therapist and client which showed potential in helping them learn new material.

In the study done by Matziorinis et al. (2023), the patients with AD also participated in physical therapy. With physical therapy, the researchers were trying to evaluate if there was a connection between the mental state of patients with AD and amount of physical activity. A control group that continued their daily routines was used to see if physical therapy proved beneficial to the quality of life of the patients. To determine the results, neuropsychological testing and MRI measurements with repeated assessments were used. More specifically, the MMSE test was used to evaluate the patients' mental state before and after physical therapy. After evaluating the results, the researchers felt as though there were not enough participants that stuck with the physical therapy to make an adequate conclusion about physical therapy as a potential treatment for AD.

Purshouse and Mukaetova-Ladinska (2009) conducted a study to evaluate the effect of dance therapy on AD and well-being. After three 15-minute sessions of dance under the guidance of a facilitator, more engagement, improved mood, and better relationships between patients and their caregivers was detected.

Visual arts therapy was also found to have a positive effect on a patient's well-being. In the study done by Burns et al. (2018), a visual performance was given to the 147 participants and a questionnaire was given both before and after the performance to test their comfort levels and their opinions on creative arts. By the end, it was found that the viewers were emotionally influenced by a single performance and had improved comfort with discussing dementia with others. This can reduce the stigma associated with AD and can improve management of symptoms and stress surrounding the diagnosis. Another case where visual arts therapy was found to uplift the quality of life of patients was in the study done by Ehresman (2014). In this study, the researcher had the participants, both with and without AD, split into three groups, and gave them four different drawing tasks. To evaluate results, the experimenters compared the details found on the drawings from people with AD to those from the ones without AD. They found that people with AD tend to have less detail in their drawings and the faces that were drawn often looked odd and unproportional. Even while neurological effects may not be as prevalent in individuals with AD, it has the ability to enhance their well-being and quality of life. Images created during a visual art therapy session may also be representative of past experiences, allowing an outlet of expression for people while helping them recall details about their life.

Discussion

This review suggests that expressive art therapies may improve various aspects of the symptoms of AD and the quality of life of individuals with this condition. While each expressive art therapy addresses different sides of the disease, when the various types of art therapy are

used together, it offers a potential non-pharmacological approach to improving the lives of those with AD. Music therapy, as shown in the studies, seems to have the most significant effect on memory recollection of patients. This is likely due to the ability of music to evoke certain emotions and memories in a patient, allowing it to be a valuable tool for AD patients suffering from memory loss. Visual arts therapy also seems to hold benefits for AD. Engaging in artistic activities can boost a person's mood due to the dopamine of completing such tasks, possibly enhancing patient quality of life. While studies on dance therapy used for AD patients is limited, the study involving Parkinson's disease shows the potential for it to improve patients' motor and cognitive function. By using music, visual arts, and dance therapy together, healthcare professionals can create a comprehensive treatment plan for AD patients to supplement pharmacological treatments. While some benefits from these art therapies were evident, it is necessary to note the scarcity of studies in visual arts and dance therapy. The limited amount of studies in these areas could limit our understanding of their full potential in an AD treatment plan. Additionally, longitudinal effects of expressive art therapies should be observed to determine if they could prove beneficial as a long-term treatment. The relationship between an AD patient and their caregiver is crucial to the quality of life of both individuals. Many of these expressive art therapies do have a positive impact on caregivers' well-being when they also participate, but this effect would need to be looked at closer to determine if this could be a feasible way to boost the lives of patients.

An important aspect of expressive art therapy that needs to be better investigated is program feasibility. In the study done by Matziorinis et al. (2023), the main goal was to determine the feasibility of implementing both physical and music therapy into the treatment plan of a patient with AD. However, due to high costs and unexpected conflicts that arose from the intervention by staff, participation in the activities was found to be not feasible. Additionally, many of the participants didn't adhere to protocols such as attendance, causing the study results to be challenging to interpret. More research is needed to determine the feasibility of expressive arts therapies for older adults with dementia and determine possible protocols and treatment plans that can be easily prescribed by physicians.

Since most of the benefits of expressive art therapies are to the quality of life and mental state of an individual, if a treatment plan includes pharmacological treatments that can help reduce or control the cognitive decline of individuals, then a patient can receive both mental and physical benefits by incorporating arts-based therapies into their treatment plan. Due to the limitations and variation in data for expressive art therapies affecting memory, and due to the fact that it is a lot riskier to rely on a untested, non-pharmacological treatment for such a key symptom of AD, using both forms of treatment in tandem could be most beneficial and reliable for the patient. With the current research in this field being limited to small populations, a next step could be to expand the number of patients taking part in each clinical trial. As participation increases, it will be important to ensure that the patient enjoys the form of therapy they are

being given, as otherwise it could have an overall detrimental effect on the well-being of the patient.

Additionally, as this form of treatment expands, rather than conducting each session in a professional setting, as many current studies are done, research could be shifted to an app-based setting. Similar to how therapy is shifting online in recent years, a therapist specializing in the specific art therapy could be present in video sessions with the patient. As time passes, the caregiver could become more attuned to the form of therapy and slowly take over for the therapist, or perform additional sessions outside of scheduled therapy. This could allow the relationship between caregiver and patient to become deeper while allowing for expansion of this treatment plan. This could also allow for expressive art therapies to be assessed in the long-term because a specialized therapist and formal setting wouldn't be needed to undergo this treatment. Another way to expand this form of treatment could be implementing locations that specialize in these forms of therapy. Similar to therapy nowadays, a patient could schedule weekly or biweekly sessions, depending on their need for therapy, with a specialized individual and could continue for as long as the patient or caregiver feels it is beneficial. The caregiver could also be present during these sessions to gain information on how they can also help the patient in the time outside the sessions. Since the number of studies on this topic is very limited, especially in more untested forms of art therapy like dance, more research is needed to determine the overall positive result that can be seen in a majority of studies conducted to date.

Ultimately, expressive art therapies pose as a non-pharmacological intervention to enhance the cognitive function, memory recollection, and overall quality of life for AD patients. Combining these therapies into a single treatment plan may offer a more extensive approach to improving the various symptoms of AD. While further research is needed to address existing limitations, the potential impact of expressive art therapies on AD is promising, offering a beacon of hope towards a future treatment of this disease.

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