



# Effect of Music Therapy on Symptoms of Depression in Elderly Patients with Alzheimer's Disease



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## Abstract

**Background:** Alzheimer's disease is a progressive neurodegenerative disorder, which leads to the loss of memory and mental functioning. It is the most common form of dementia, a general term that covers a broad range of brain disorders that cause a severe decline in mental ability. Psychosocial interventions, such as music therapy, are increasingly used to alleviate the psychological symptoms of people with dementia, including those with Alzheimer's.

**Objective:** To determine the effect of music therapy on symptoms of depression in elderly Alzheimer's patients.

**Methods:** We will conduct a structured literature review of English-language peer-reviewed articles published during or after the year 2000 on PubMed and PsycINFO to find the most relevant studies. Reports will be selected on the basis of study design, target group and measurements used.

**Results:** The search strategy allowed for 5 articles to be obtained, with various study designs. In general, the depressive symptoms scores as assessed by the Geriatric Depression Scale or Cornell Scale for Depression in Dementia, improved in elderly patients with Alzheimer's Disease after receiving music therapy.

**Conclusion:** Music therapy has a positive effect on the depressive symptoms of Alzheimer's patients. Further research is required to demonstrate the efficacy and long term effect of music therapy as a standard treatment.

## Objective

To determine the effect of music therapy on symptoms of depression in elderly patients with Alzheimer's disease.

## Background/ Rationale

Alzheimer's disease (AD) is neurodegenerative disorder, which leads to a progressive loss of memory and decline in mental functioning.<sup>1</sup> It is the most common type of dementia, a general term that covers a broad range of brain disorders that cause a severe decline in mental ability. Depression is a prevalent comorbidity in patients with AD.<sup>1</sup> As the disease progresses, the likelihood of developing depressive symptoms increases and can lead to increased caregiver burden.<sup>2</sup> Psychosocial interventions, such as music therapy, are increasingly used to alleviate the psychological symptoms of people with dementia, including those with AD.<sup>3</sup>

**Rationale:** Age is one of the greatest risk factors for AD, with prevalence of AD highest in those 65+.<sup>4</sup> With our aging society, the prevalence of AD is expected reach 66 million worldwide by 2030.<sup>4</sup> As the number of dementia cases continue to rise, it is important to uncover innovative ways to treat those with AD in order to improve quality of life. Pharmacological treatments are common due to their therapeutic effects, but even so, the effects are minimal.<sup>5</sup> Therefore, there is a need to investigate other nonpharmacological treatments such as music therapy, in order to alleviate psychiatric symptoms, and improve the quality of life of those affected by AD.

## Methodology

Searched PubMed and PsycINFO

**Inclusion:** Research needed to assess depressive symptoms in patients with Alzheimer's disease or Alzheimer's type demntia using music therapy

Search terms included "music therapy" AND "Alzheimer\*" AND "depression"

Excluded studies before Jan 1, 2000 (n=1)

Excluded studies not in English (n=7)

Excluded studies based on inaccessibility to full text (n=2)

n=25 articles were identified originally

n= 17 article abstracts reviewed

n=5 articles identified that were relevant to our review

## Results

Table 1. Results of structured literature review.

Study	Authors Type of Study	Population	Intervention	Assessment	Outcome
1	Kydd, 2001 Case study	• n = 1 • Alzheimer's disease & depressive symptoms. • Year of birth: 1913 • Kitchener, Ontario	• Active music therapy <sup>1</sup> • Sessions per week: 1 • Each session: 20 min., increasing to 30 min. • Duration: 8 months • Individual & group sessions	Qualitative assessment done by music therapist & recreational therapist throughout period of intervention	Reduced depressive symptoms. Subject became less reclusive and engaged in more social and recreational activities
2	Guétin et al., 2009 Randomized control trial	• n = 30 Case group: n= 15 Control group: n= 15 • Mild to moderate Alzheimer's disease and depressive symptoms. • Age range: 70 to 95 • Montpellier, France	• Receptive music therapy <sup>2</sup> • Sessions per week: 1 • Each session: 20 min. • Duration: 16 weeks • Individual sessions.	Geriatric Depression Scale (GDS) <sup>3</sup> 1. Day 0 2. Week 4 3. Week 8 4. Week 16 5. Week 24	Significant decrease in depression scores (p<0.01) from Week 4 to Week 16. Effect of music therapy sustained for up to 8 weeks after end of therapy (Week 16 to Week 24). See Table 3.
3	Ozdemir & Akdemir, 2009 Quasi-experimental	• n = 27 • Mild Alzheimer's disease and depressive symptoms. • Aged: 81+ • Turkey	• Receptive active therapy <sup>2</sup> • Sessions per week: 4 • Duration: 3 weeks • Group sessions. 4 to 5 participants/ group.	GDS <sup>3</sup> 1. One week prior to start of intervention 2. At end of intervention 3. Three weeks after end of intervention	Significant decrease in depression scores over time (p=0.001). Revert to upward trend 3 weeks after end of intervention. See Table 3.
4	Ray & Mittelman, 2015 Quasi-experimental	• n = 17 • Alzheimer's disease and depressive symptoms. • Age range: 59 to 101 • New York, NY	• Active music therapy <sup>1</sup> • Sessions per week: 3 • Each session: 15 min. to 1 hour • Duration: 2 weeks • Group sessions. 4 to 6 participants per group.	CSDD <sup>4</sup> 1. Two weeks before start of intervention 2. At start of intervention 3. At end of intervention 4. Two weeks after end of intervention	Significant decrease in depressive symptoms (p<0.01). Effect of music therapy sustained for at least two weeks post-intervention. See Table 2.
5	Kim et al., 2015 Randomized control trial	• n = 53 Case group: n= 32 Control group: n= 21 • Alzheimer's disease and depressive symptoms. • Age range: 61 to 94 • Seoul, South Korea	• Active music therapy <sup>1</sup> • Sessions per week: 5 • Each session: 1 hour • Duration: 6 months	GDS <sup>4</sup> 1. At start of intervention 2. At end of intervention	No significant changes in depression scores (p=0.09). However, scores showed trend towards improvement. See Table 3.

<sup>1</sup> Receptive music therapy: Therapist provides patient's preferred music. Patient listens to music and provides feedback to therapist. Individualized to patient.

<sup>2</sup> Active music therapy: Individual engages in singing and/or playing instruments and/or moving to rhythm/music. Typically occurs in a group setting with an instructor.

<sup>3</sup> Geriatric Depression Scale (GDS): Self-assessment questionnaire. 30 questions. Scores: 10 - 19 = mild depression, 20 - 30 = severe depression. Maximum score = 30.

<sup>4</sup> Cornell Scale for Depression in Dementia (CSDD): Clinician-obtained information from patient and informant. 19 questions. Score of >10 indicates probable major depressive episode. Score >18 indicates definite major depressive episode. Maximum score = 38.

	Music therapy		p	
	n	mean ± SD		
4	2 weeks before start of intervention	17	8.31 ± 5.06	< 0.001
	At start of intervention	17	7.99 ± 5.64	
	At end of intervention	17	5.17 ± 4.37	
	2 weeks after end of intervention	17	6.66 ± 5.75	

Table 2. Depressive symptoms as measured by the Cornell Scale for Depression in Dementia (CSDD).

Study	Time Point	Music therapy		Control		p
		n	mean ± SD	n	mean ± SD	
Study 2	Day 0	15	16.7 ± 6.2	15	11.8 ± 7.4	0.06
	Week 4	15	13.1 ± 6.1	15	12.1 ± 7.2	0.046
	Week 6	15	11.4 ± 5.0	12	12.4 ± 5.6	0.009
	Week 16	14	8.9 ± 3.3	12	11.2 ± 6.1	0.002
	Week 24	13	12.5 ± 6.4	11	12.1 ± 7.6	0.003
Study 3	Assessment #1	27	9.5	-	-	
	Assessment #2	27	6	-	-	0.001
	Assessment #3	27	6.9	-	-	
Study 5	Baseline	32	16.31 ± 7.73	21	15.31 ± 6.85	0.93
	Month 6	32	14.87 ± 7.69	21	15.20 ± 6.75	0.09

Table 3. Depressive symptoms as measured by the Geriatric Depression Scale (GDS).

## Discussion

The studies chosen show promising results for use of music therapy to alleviate depressive symptoms in those with Alzheimer's disease. Study 2 had high internal validity due to its rigorous statistical methods and blind assessment. Interestingly, almost all the studies tailored the music therapy to the individual's musical interests, which appears to be key to the effectiveness of music therapy.

**Limitations:** There is a lack of large-scale evidence on this topic, which limited the availability of quality studies.

Study 5 lacked blind assessment of the case and control groups. More than one therapy was used, possibly leading to interactive effects between variables, introducing bias.

External validity and the assessment of the effectiveness of music therapy were limited by small sample sizes.

Social interaction may have been a confounder for decreased depressive symptoms in studies that utilized group sessions (Studies 1, 2, 4 and 5). A self-reporting bias may have been presented when using the GDS to score patients with dementia.

Comparison between study results was difficult since a variety of methods were utilized:

- Music therapy methods (i.e. active vs. receptive)
- Assessment tools (i.e. GDS, CSD, qualitative assessment)
- Length and duration of intervention
- Study design and quality (i.e. RCT, quasi-experimental, case study)

**Outlook:** Future work in this field should include large-scale randomized control trials and ensure CONSORT guidelines are utilized to enhance methodological quality. Further research is needed to compare the effectiveness of active and receptive music therapy methods.

The results of this study and future research have the potential to influence policy development for Alzheimer's care, supporting the use of music therapy in clinical treatment.

## Conclusions

Music therapy generally had a significant positive effect in reducing depressive symptoms of those with Alzheimer's Disease. Further research is required to demonstrate the efficacy and long term effect of music therapy as a standard treatment.

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