

Effectiveness of Music Therapy on Mental Health and Quality of Life among Patients Receiving Palliative Care: A Randomized Controlled Trial

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Abstract

Background: Patients receiving palliative care frequently experience high levels of anxiety, depression, and diminished quality of life (QoL) alongside physical symptom burden. Music therapy has been proposed as a low-cost, non-pharmacological adjunct that may address both psychological and existential dimensions of suffering, but high-quality randomized evidence from Indian palliative care settings remains limited.

Objective: To evaluate the effectiveness of a structured music therapy program on mental health (anxiety and depression) and quality of life among patients receiving palliative care, compared with standard palliative care alone.

Methods: In this two-arm, parallel-group, assessor-blinded randomized controlled trial, 80 adult patients receiving inpatient palliative care were randomly allocated 1:1 to a music therapy group (n=40), receiving live and recorded receptive music therapy sessions of 20–30 minutes, three times weekly for two weeks in addition to standard care, or a control group (n=40) receiving standard palliative care alone. Mental health was assessed using the Hospital Anxiety and Depression Scale (HADS), and QoL was assessed using the EORTC QLQ-C15-PAL, at baseline and on day 14. Pain was measured using a Numeric Pain Rating Scale (NPRS).

Results: Both groups were comparable at baseline (all $p > 0.05$). At day 14, the music therapy group showed significantly greater reductions in HADS-Anxiety (mean change -3.8 vs -0.9 , $p < 0.001$) and HADS-Depression (-2.9 vs -0.7 , $p = 0.002$), and significantly greater improvement in EORTC QLQ-C15-PAL global QoL ($+16.4$ vs $+3.2$).

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points, $p < 0.001$) compared with the control group. Effect sizes were moderate to large (Cohen's d 0.45–0.98). Pain scores also improved more in the music therapy group ($p = 0.041$).

Conclusion: A structured music therapy program produced clinically meaningful improvements in anxiety, depression, and quality of life among patients receiving palliative care, supporting its use as an adjunct to standard palliative care. Larger multicentric trials are warranted to confirm these findings and establish optimal dosing and delivery protocols.

Keywords: Music therapy; Palliative care; Quality of life; Anxiety; Depression; Randomized controlled trial

How to cite this article: Garhpale A, Nagore G, Sinha P, Shastri U, Negi M, Routhan T, Chaudhuri S, Jayalakshmi, Chaudhary H, Parveen S. Effectiveness of music therapy on mental health and quality of life among patients receiving palliative care: a randomized controlled trial. *Int J Drug Deliv Technol.* 2026;16(74s): 1906-1911. DOI: 10.25258/ijddt.16.74s.149

1. Introduction

Palliative care aims to improve the quality of life of patients and families facing life-threatening illness through the prevention and relief of suffering by means of early identification, assessment, and treatment of pain and other physical, psychosocial, and spiritual problems.

Despite advances in symptom control, patients receiving palliative care continue to report substantial psychological distress. Anxiety, depression, existential distress, and impaired quality of life are common across diagnoses, including advanced cancer and end-stage organ failure, and often persist even when physical symptoms are well controlled.

Music therapy, defined as the clinical use of music interventions by a trained therapist to accomplish individualized goals within a therapeutic relationship, has been increasingly integrated into palliative and hospice care since its emergence in this context in the 1970s. Both receptive approaches, in which patients listen to live or recorded music, and active approaches, involving singing, playing, or song-writing, have been described.

Prior randomized controlled trials and systematic reviews suggest that music therapy may reduce pain, fatigue, and anxiety and improve quality of life in palliative care populations, although the evidence base has been described as positive but methodologically weak, with small sample sizes and heterogeneous protocols limiting generalizability. Few trials have been conducted in South Asian palliative care settings, where cultural and musical preferences differ substantially from the Western contexts in which most existing trials were conducted.

Given the low cost, absence of significant adverse effects, and broad patient acceptability of music therapy, further rigorous evaluation in diverse care settings is warranted. This study aimed to evaluate the effectiveness of a structured, culturally adapted music therapy program on mental health and quality of life among patients receiving palliative care, using a randomized controlled design.

2. Materials and Methods

2.1 Study Design and Setting

This was a two-arm, parallel-group, assessor-blinded randomized controlled trial conducted in the Mahanandan Super Speciality Hospital, Greater Noida, Uttar Pradesh.

2.2 Participants

Adult patients (aged ≥ 18 years) admitted to the palliative care unit with a life-limiting illness and a Karnofsky Performance Status score of ≥ 40 were considered eligible.

Inclusion criteria: (i) clinician-confirmed diagnosis of a life-limiting illness; (ii) expected survival of more than two weeks as assessed by the treating physician; (iii) ability to communicate and complete self-report questionnaires, with or without assistance; (iv) willingness to provide informed consent.

Exclusion criteria: (i) severe cognitive impairment or delirium precluding reliable self-report (Mini-Mental State Examination score < 20); (ii) severe hearing impairment; (iii) pre-existing diagnosed psychiatric disorder on active pharmacological treatment; (iv) prior regular participation in music therapy (more than

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four sessions) in the preceding month; (v) medically unstable condition precluding participation as judged by the treating physician.

2.3 Sample Size

Sample size was estimated based on the primary outcome (HADS-Anxiety), using data from comparable prior trials indicating a between-group mean difference of approximately 3.0 points with a pooled standard deviation of 4.5. With $\alpha=0.05$ (two-tailed) and power=80%, a minimum of 36 participants per group was required; this was inflated to 40 per group (total N=80) to account for an anticipated attrition rate of approximately 10%, consistent with attrition observed in prior palliative care trials.

2.4 Randomization and Blinding

Eligible participants were randomly allocated in a 1:1 ratio to the music therapy group or the control group using a computer-generated random number sequence with block randomization (block size of 4), stratified by primary diagnosis category (cancer vs non-cancer). Allocation concealment was maintained using sequentially numbered, opaque, sealed envelopes prepared by an investigator not involved in recruitment or outcome assessment. Given the nature of the intervention, participants and therapists could not be blinded; however, outcome assessors administering the HADS and EORTC QLQ-C15-PAL were blinded to group allocation.

2.5 Interventions

Music Therapy Group: In addition to standard palliative care, participants received individualized receptive music therapy sessions delivered by a trained music therapist, lasting 20–30 minutes, three times weekly for two consecutive weeks (six sessions total). Sessions incorporated live and recorded music selected according to individual patient preference (including devotional, classical, and familiar folk music), delivered in a quiet, private setting, with attention to breathing rate and relaxation response.

Control Group: Participants received standard palliative care alone, including pharmacological symptom management, nursing care, and routine psychosocial support, without any structured music intervention, for the same two-week period.

2.6 Outcome Measures

The primary outcome was change in mental health status, assessed using the Hospital Anxiety and

Depression Scale (HADS), a validated 14-item self-report instrument comprising anxiety and depression subscales (score range 0–21 each), administered at baseline and on day 14.

Secondary outcomes included quality of life, assessed using the EORTC QLQ-C15-PAL, a validated 15-item questionnaire developed specifically for patients in palliative care, yielding a global QoL score and functional subscale scores (0–100, higher scores indicating better QoL); and pain intensity, assessed using a 0–10 Numeric Pain Rating Scale (NPRS). All outcomes were assessed at baseline and on day 14 by blinded assessors.

2.7 Statistical Analysis

Data were analyzed using an intention-to-treat approach with SPSS version 26.0 (IBM Corp., Armonk, NY). Continuous variables are presented as mean $\pm$ standard deviation and categorical variables as frequency (percentage). Baseline comparability between groups was assessed using independent samples t-tests for continuous variables and chi-square tests for categorical variables. Between-group differences in change scores from baseline to day 14 were analyzed using independent samples t-tests (or Mann-Whitney U tests for non-normally distributed data), and within-group changes were analyzed using paired t-tests. Analysis of covariance (ANCOVA), adjusting for baseline scores, was used to confirm between-group treatment effects. Effect sizes were calculated using Cohen's d. A two-tailed p-value <0.05 was considered statistically significant.

3. Results

Eighty-four patients were screened for eligibility 80 met inclusion criteria and were randomized (40 to each group). Three participants (one in the music therapy group, two in the control group) were lost to follow-up due to clinical deterioration or death prior to day 14 assessment and were included in the intention-to-treat analysis using last-observation-carried-forward for missing data. No adverse events related to the music therapy intervention were reported.

3.1 Baseline Characteristics

Baseline demographic and clinical characteristics were comparable between groups, with no statistically significant differences observed (Table 1).

Variable	Music Therapy	Control Group (n=40)	p-value

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	Group (n=40)		
Age, years (mean ± SD)	58.6 ± 11.2	57.9 ± 10.8	0.771
Sex, n (%) Female	22 (55.0)	20 (50.0)	0.652
Primary diagnosis, n (%)			0.812
Advanced cancer	31 (77.5)	30 (75.0)	
End-stage organ failure	6 (15.0)	7 (17.5)	
Other terminal illness	3 (7.5)	3 (7.5)	
Karnofsky Performance Score (mean ± SD)	52.4 ± 9.6	53.1 ± 9.1	0.735
Time since palliative care admission, days (mean ± SD)	9.8 ± 4.2	10.3 ± 4.6	0.612
Prior exposure to music therapy, n (%)	5 (12.5)	6 (15.0)	0.747

3.2 Effect on Mental Health and Quality of Life

At day 14, the music therapy group demonstrated significantly greater improvements than the control group across all primary and secondary outcomes (Table 2). HADS-Anxiety and HADS-Depression scores decreased significantly more in the music therapy group, and EORTC QLQ-C15-PAL global quality of life and emotional functioning scores improved significantly more in the music therapy group. Pain scores, assessed as a secondary physical outcome, also showed a significantly greater reduction in the music therapy group.

Outcome measure	MT Group Baseline	MT Group Day 14	Control Baseline	Control Day 14	Between-group p
HADS – Anxiety (0–21)	12.4 ± 3.1	8.6 ± 2.7	12.1 ± 3.3	11.2 ± 3.0	<0.001
HADS – Depression	11.8 ± 3.4	8.9 ± 2.9	11.5 ± 3.2	10.8 ± 3.1	0.002

Outcome measure	MT Group Baseline	MT Group Day 14	Control Baseline	Control Day 14	Between-group p
HADS – Total score (0–42)	24.2 ± 5.7	17.5 ± 4.9	23.6 ± 5.5	22.0 ± 5.3	<0.001
EORTC QLQ-C15-PAL Global QoL (0–100)	42.3 ± 12.1	58.7 ± 13.4	43.0 ± 11.8	46.2 ± 12.0	<0.001
EORTC QLQ-C15-PAL Emotional functioning (0–100)	45.6 ± 13.0	63.9 ± 14.2	44.9 ± 12.7	49.1 ± 13.5	<0.001
Numeric Pain Rating Scale (0–10)	5.4 ± 1.8	4.2 ± 1.6	5.3 ± 1.9	4.9 ± 1.7	0.041

3.3 Within-Group Change and Effect Sizes

Within-group change scores with 95% confidence intervals and between-group effect sizes are presented in Table 3. The largest effect size was observed for global quality of life (Cohen's d=0.98), followed by anxiety (d=0.91), depression (d=0.68), and pain (d=0.45), indicating moderate to large clinical effects of the music therapy intervention.

Outcome measure	MT Group Mean change (95% CI)	Control Mean change (95% CI)	Cohen's d
HADS – Anxiety	–3.8 (–4.5 to –3.1)	–0.9 (–1.5 to –0.3)	0.91
HADS – Depression	–2.9 (–3.6 to –2.2)	–0.7 (–1.3 to –0.1)	0.68
QLQ-C15-PAL Global QoL	+16.4 (14.1 to 18.7)	+3.2 (1.4 to 5.0)	0.98

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Numeric Pain Rating Scale	-1.2 (-1.7 to -0.7)	-0.4 (-0.8 to 0.0)	0.45
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4. Discussion

This randomized controlled trial found that a structured, individualized music therapy program delivered over two weeks produced significantly greater improvements in anxiety, depression, and quality of life among patients receiving palliative care, compared with standard care alone. These findings are consistent with prior trials and systematic reviews reporting beneficial effects of music therapy on psychological symptoms and quality of life in palliative and end-of-life care populations.

The magnitude of improvement observed in this trial, particularly for anxiety and global quality of life, was clinically meaningful and comparable to or exceeding effect sizes reported in previous European trials conducted in hospice and palliative care units. This may reflect the individualized, culturally tailored selection of music, which incorporated patients' preferred devotional and familiar musical traditions, a factor that has been suggested to enhance the therapeutic response to receptive music interventions.

The observed improvement in pain scores, although a secondary outcome, aligns with prior evidence suggesting that music therapy may reduce pain perception in palliative care patients, potentially through mechanisms involving relaxation, distraction, and modulation of autonomic arousal, in addition to its direct psychological benefits.

From a clinical standpoint, music therapy represents a low-cost, non-pharmacological, well-tolerated intervention with no reported adverse effects in this trial, making it an attractive adjunct to pharmacological and psychosocial approaches already used in palliative care. Its integration into multidisciplinary palliative care teams, including physiotherapy-led rehabilitation and symptom management programs, may further enhance holistic patient-centered care.

4.1 Limitations

This study has several limitations. First, participants and therapists could not be blinded to group allocation given the nature of the intervention, which may have introduced performance bias, although outcome assessors were blinded. Second, the follow-up period was limited to two weeks, precluding assessment of

longer-term or sustained effects, which is particularly relevant given the progressive nature of illness in this population. Third, the single-center design may limit generalizability to other cultural and clinical settings.

5. Conclusion

A structured music therapy program, delivered as an adjunct to standard palliative care, was associated with clinically meaningful improvements in anxiety, depression, and quality of life among patients receiving palliative care. These findings support the integration of music therapy into multidisciplinary palliative care services. Larger, multicentric randomized trials with longer follow-up are recommended to confirm these findings, determine optimal dosing and delivery protocols, and evaluate sustained effects on psychological well-being and quality of life.

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