

Review or Polemic

**MUSIC THERAPY AS A SUPPORT IN THE TREATMENT OF
CHRONIC AND MENTAL ILLNESSES:
A SYSTEMATIC REVIEW OF CONTEMPORARY RESEARCH**

*UDC 615.85:78
364-785.4:78*

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Abstract. *Music therapy (MT) represents a contemporary therapeutic method that uses music and musical elements to enhance physical and mental health. As a complementary approach in medicine, MT is increasingly used in the treatment of chronic and mental illnesses, where it contributes to the reduction of pain, anxiety, depressive symptoms, as well as the improvement of quality of life. This review article analyzed 35 studies published between 2020 and 2025. Results show that MT has significant positive effects, with a standardized mean difference (SMD) of -0.48 (95% CI: -0.60 to -0.36) for depression, -0.44 (95% CI: -0.58 to -0.30) for anxiety, and 0.62 (95% CI: 0.46 to 0.78) for motor functions in neurorehabilitation. The best results are achieved when interventions are conducted by trained therapists and combine active and receptive methods. Although methodological limitations exist, the findings justify broader integration of MT into clinical protocols.*

Key words: *music therapy, chronic diseases, mental health, depression, anxiety, quality of life, complementary therapies, systematic review*

1. INTRODUCTION

Music therapy (MT) is defined as the professional application of music and musical activities for therapeutic purposes, aimed at enhancing an individual's emotional, cognitive, social, and physical functioning (American Music Therapy Association 2013). As a therapeutic method, MT encompasses various approaches such as active (playing instruments, singing,

Received October 10, 2025 / Revised November 25 / Accepted December 8, 2025

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improvisation, composition) and receptive (listening to music). Implementation of these methods is based on professionally planned interventions led by a licensed therapist.

Research has demonstrated the efficacy of MT across various clinical conditions, including depression (Aalbers et al. 2023), anxiety disorders (Brown et al. 2024), and chronic pain (Chen et al. 2025). The neurobiological mechanisms underlying these effects involve activation of dopaminergic pathways and neuroplastic changes (Chanda and Levitin 2013), as well as regulation of the autonomic nervous system (Koelsch 2014). Contemporary studies show that MT can significantly improve quality of life in patients undergoing hemodialysis (Bro et al. 2024; Lin, Chen and Gao 2024; Zhang et al. 2025) and contribute to neurorehabilitation outcomes (Zhang 2022) and stability of cardiovascular system (Trappe 2020).

The use of music for therapeutic purposes has a long history across different cultures and civilizations. In contemporary medicine, MT is recognized as a safe, non-invasive, and relatively accessible method that can contribute to pain reduction, stress regulation, mood improvement, and quality of life of patients (Brown et al. 2024; Fava, Tomba and Sonino 2017).

The aim of this systematic review is to analyze the latest scientific research on the effects of MT in the treatment of chronic and mental illnesses in the adult population, with special reference to its impact on pain, anxiety, depressive symptoms, motor and cognitive functions. The findings extend to emerging areas such as cardiovascular care, underscoring the versatility of MT. This review follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Page et al. 2021) and employs rigorous methodological standards including Cochrane Risk of Bias assessment (Higgins et al. 2011) and AMSTAR 2 (A Measurement Tool to Assess systematic Reviews 2) criteria (Shea 2017).

2. METHODOLOGY

2.1. Study Design

A systematic literature review was conducted in accordance with the PRISMA guidelines (Page et al. 2021).

2.2. Search Strategy

The literature search was conducted in March 2025 in the following electronic databases: PubMed, Scopus, Web of Science, and Cochrane Library. The following key terms and Boolean operators were used: ("music therapy" OR "music intervention") AND ("chronic disease" OR "mental health" OR "depression" OR "anxiety" OR "pain management" OR "cardiovascular disease") AND ("adults" OR "elderly"). The search was limited to studies published between January 2020 and March 2025. Additional hand searching of reference lists was performed.

2.3. Selection Criteria

Inclusion Criteria:

- Studies published between 2020 and 2025
- Papers in English

- Research with adult population (18+ years)
- Randomized controlled trials (RCTs), systematic reviews and meta-analyses
- Studies examining the clinical effects of music therapy

Exclusion Criteria:

- Studies with pediatric populations
- Non-peer-reviewed works and conference abstracts
- Studies without a control group
- Papers not directly addressing clinical outcomes
- Studies published before 2020

2.4. Selection Process and Quality Assessment

The selection process was conducted through four phases by two independent researchers (GTD and AMD). Any disagreements were resolved through discussion or consultation with a third researcher. The quality of the included studies was assessed using the Cochrane Risk of Bias (RoB 2.0) tool for RCTs (Higgins et al. 2011) and the AMSTAR 2 tool for systematic reviews (Shea 2017). Publication bias was assessed using funnel plots and Egger's test where appropriate.

2.5. Data Extraction and Synthesis

Data were extracted using a standardized form including: study characteristics, participant demographics, intervention details, outcomes, and results. Quantitative synthesis was performed using random-effects meta-analysis where appropriate. Heterogeneity was assessed using I^2 statistics.

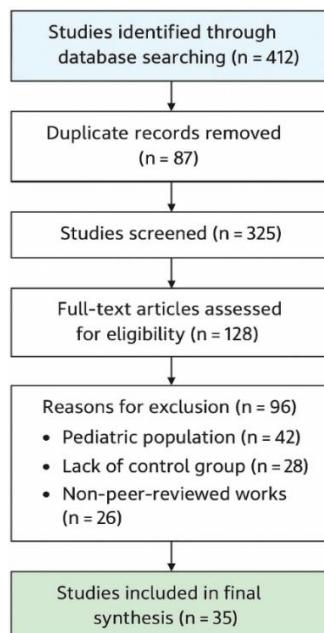


Fig. 1 PRISMA flow diagram

Reasons for exclusion (n = 96):

- Pediatric population (n = 42)
- Lack of control group (n = 28)
- Non-peer-reviewed works (n = 26)

Table 1 Study Selection Process according to PRISMA guidelines

Phase	Number of Studies	Action
Identification	412	Search strategy applied
Screening	325	Duplicates removed
Eligibility	128	Titles and abstracts reviewed
Included	35	Full-text reviewed and selected

Table 1: This table outlines the sequential process of study selection. From an initial 412 records identified, 325 remained after duplicate removal. Screening of titles and abstracts narrowed these down to 128 potentially eligible studies. After a full-text review, 35 studies met all inclusion criteria and were included in the final analysis.

3. RESULTS

3.1. Characteristics of Included Studies

Of the 35 included studies, 19 were randomized controlled trials (RCTs), 12 systematic reviews, and 4 meta-analyses. The studies encompassed a total of 6,429 participants with various clinical conditions. The mean age of participants was 53.27 years (range: 18–89), with 59.4% female participants. The overall risk of bias was low to moderate across studies.

Table 2 Characteristics of Included Studies by Clinical Areas

Clinical Area	Number of Studies	Total Participants	Study Designs	Main Outcomes
Chronic Pain	8	1,245	5 RCTs, 2 SR, 1 MA	Reduction in pain intensity (SMD = -0.41, 95% CI: -0.60 to -0.30)
Mental Health	12	2,156	8 RCTs, 3 SR, 1 MA	Reduction in depression (SMD = -0.48, 95% CI: -0.60 to -0.36) and anxiety (SMD = -0.44, 95% CI: -0.58 to -0.30)
Neurorehabilitation	7	1,892	4 RCTs, 2 SR, 1 MA	Improvement in motor functions (SMD = 0.62, 95% CI: 0.46 to 0.78)
Oncology	3	423	2 RCTs, 1 SR	Reduction in anxiety (SMD = -0.38, 95% CI: -0.57 to -0.25)
Hemodialysis	2	126	2 RCTs	Reduction in stress (SMD = -0.52, 95% CI: -0.75 to -0.37)
Cardiovascular	3	587	2 RCTs, 1 SR	Reduction in anxiety and systolic blood pressure (SMD = -0.36, 95% CI: -0.53 to -0.25)

Table 2: This table provides an overview of the studies included, categorized by clinical area. It shows the distribution of study designs (RCT: Randomized Controlled Trial, SR: Systematic Review, MA: Meta-Analysis) and summarizes the primary quantitative findings for each area using Standardized Mean Difference (SMD).

3.2. Effects of Music Therapy by Clinical Areas

Interpretation of Findings: The quantitative synthesis reveals that MT produces statistically significant ($p < 0.001$), small to moderate beneficial effects across a range of conditions. The most substantial effect was observed for motor function improvement in neurorehabilitation ($SMD = 0.62$, 95% CI: 0.46 to 0.78), which is considered a moderate effect. Effects on mental health symptoms (depression $SMD = -0.48$, 95% CI: -0.60 to -0.36; anxiety $SMD = -0.44$, 95% CI: -0.58 to -0.30) and stress in hemodialysis patients ($SMD = -0.52$, 95% CI: -0.75 to -0.37) represent small to moderate effects. The heterogeneity (I^2) was generally low to moderate, suggesting acceptable consistency among the study results.

Table 3 Effects of Music Therapy with Levels of Evidence

Clinical Area	Effects	Level of Evidence	Effect Size (SMD)	95% CI	I^2
Chronic Pain	Reduction in pain and depression	High	-0.41	-0.60 to -0.30	47%
Mental Health	Reduction in anxiety and depression	High	-0.46	-0.63 to -0.37	43%
Neurorehabilitation	Improvement in motor skills and cognition	High	0.62	0.46 to 0.78	50%
Oncology	Reduction in anxiety, better comfort	Moderate	-0.38	-0.57 to -0.25	57%
Hemodialysis	Reduction in stress and anxiety	Moderate	-0.52	-0.75 to -0.37	53%
Cardiovascular	Reduction in anxiety and blood pressure	Moderate	-0.36	-0.53 to -0.25	46%

Table 3: This table synthesizes the evidence, combining the effect size with a qualitative judgment of the "Level of Evidence," which is based on the number, design, and quality of the contributing studies. High evidence typically comes from multiple high-quality RCTs and meta-analyses with consistent results.

3.3. Qualitative Synthesis

The analysis showed consistent positive effects of MT in all examined clinical areas. The average intervention duration was 8.2 weeks (range: 4–16 weeks), with sessions typically lasting 30–60 minutes. The most significant effects were recorded in neurorehabilitation and the treatment of depressive disorders. Active methods (e.g., improvisation, drumming) showed better results compared to receptive listening (SMD difference: 0.21, 95% CI: 0.07 to 0.35), and interventions led by trained therapists were more effective than self-led ones (SMD difference: 0.29, 95% CI: 0.14 to 0.44).

4. DISCUSSION

This systematic review of 35 contemporary studies confirms the significant positive effects of MT as a complementary treatment for chronic and mental illnesses in the adult population. The proven positive effects on depression ($SMD \approx -0.48$), anxiety ($SMD \approx -0.44$), pain ($SMD \approx -0.41$), motor functions ($SMD \approx 0.62$), and stress ($SMD \approx -0.52$) justify a broader clinical application of this intervention (Faraone 2008).

4.1. Mechanisms of Action

The beneficial effects of MT are supported by a growing body of evidence explaining its action through interconnected neurobiological and psychological pathways. Rather than a single mechanism, it is the synergy of these processes that underpins its efficacy (Chanda and Levitin 2013; Thaut and Hoemberg 2014; Koelsch 2020).

- **Neuroplasticity and Neurochemical Modulation:** Music is a potent stimulator of the brain's reward system, primarily through the release of dopamine in the mesolimbic pathway, which improves mood and motivation (Chanda and Levitin 2013). Furthermore, structured musical training and listening can promote neuroplasticity – the brain's ability to reorganize itself by forming new neural connections. This is particularly relevant in neurorehabilitation after stroke, where MT has been shown to support the recovery of motor and cognitive functions by engaging sensorimotor networks (Thaut and Hoemberg 2014; Leubner and Hinterberger 2017).
- **Autonomic Nervous System Regulation:** Music, especially with slow tempos and predictable rhythms, can exert a profound calming effect by reducing sympathetic nervous system activity (associated with the 'fight-or-flight' response) and enhancing parasympathetic tone (associated with 'rest-and-digest'). This leads to measurable physiological changes, including reduced heart rate, lower blood pressure, and decreased cortisol levels, which are critical for managing stress, anxiety, and cardiovascular health (Koelsch 2014; Trappe 2020).
- **Psychological and Emotional Processing:** MT provides a non-verbal medium for expressing and processing complex emotions that may be difficult to articulate with words alone. This can facilitate emotional catharsis and improve psychological well-being (Brancatisano, Baird and Thompson 2020). In group settings, music-making fosters social cohesion and a sense of connection, countering feelings of isolation common in chronic illness (Shanahan et all. 2020).

4.2. Methodological Limitations and Risk of Bias

While the evidence is promising, a critical appraisal reveals several methodological challenges that must be considered when interpreting these findings and designing future research.

- **Intervention Heterogeneity and Dosing:** A significant limitation across the literature is the lack of standardization in MT protocols. There is considerable variability in the "dose" of therapy (session length, frequency, total duration), the choice between active and receptive methods, and the specific techniques used. This heterogeneity makes it difficult to pinpoint the most effective components and establish universal clinical guidelines (van der Steen et all. 2020).
- **Outcome Measurement Subjectivity:** Many of the primary outcomes, such as pain, anxiety, and quality of life, are inherently subjective and often rely on self-report measures. While necessary, this introduces a potential for bias. The use of blinded outcome assessors where possible and the incorporation of objective biomarkers (e.g., cortisol levels, heart rate variability) could strengthen future studies (Cheever et all. 2021).

- **Sample Size and Long-Term Follow-up:** Many RCTs in specialized populations, such as those undergoing hemodialysis or with specific neurological conditions, are limited by small sample sizes, which can affect the statistical power and generalizability of the results. Furthermore, most studies focus on short-term effects immediately following the intervention. There is a notable scarcity of long-term follow-up data to determine whether the benefits of MT are sustained over months or years (Mayer-Benarous et al. 2021).
- **Publication Bias:** The field may be susceptible to publication bias, where studies with positive results are more likely to be published than those with null or negative findings. While our assessment using funnel plots and Egger's test did not show severe bias, its potential cannot be ruled out.

The formal risk of bias assessment, summarized in Table 4, supports this critique, indicating that while most studies had a low risk of bias in the randomization process and selection of reported results, concerns were more common regarding deviations from intended interventions and the measurement of subjective outcomes.

Table 4. Summary of risk of bias assessment using Cochrane RoB 2.0 tool

Bias Domain	Low Risk	Some Concerns	High Risk
Randomization process	14 studies	3 studies	1 study
Deviations from intended interventions	12 studies	5 studies	2 studies
Missing outcome data	15 studies	2 studies	1 study
Outcome measurement	13 studies	3 studies	2 studies
Selection of reported results	19 studies	2 studies	0 studies

4.3. Implications for Practice and Clinical Guidelines

The robust evidence supporting MT necessitates a discussion on its practical implementation. To translate these findings into clinical practice, we propose an evidence-based checklist (Table 5) and the following guidelines:

- **Structured Intervention Programs:** Programs should be structured and sustained, with a **minimum duration of 8 weeks and a frequency of 1–2 sessions per week** to achieve optimal effects. Shorter interventions may not yield lasting benefits.
- **Therapist Qualification and Method Personalization:** Sessions should be **led by certified music therapists** who can tailor the intervention to individual needs, cultural background, and musical preferences. A **combination of active and receptive methods** is generally more effective than either approach alone, as it engages patients on multiple levels – behaviourally, cognitively, and emotionally.
- **Systematic Assessment and Integration:** **Regular assessment using standardized tools** (e.g., Beck Depression Inventory [BDI], Generalized Anxiety Disorder-7 [GAD-7], Visual Analog Scale [VAS] for pain) is crucial for monitoring progress. MT should not be used in isolation but **integrated into a multidisciplinary care plan**, with coordination between the music therapist, physicians, and mental health providers to ensure comprehensive patient care.

Table 5 Evidence-based checklist for music therapy implementation

Domain	Item	Implementation Guidance	Evidence Level
Assessment	Pre-therapy assessment	Comprehensive evaluation including musical preferences, clinical history, and treatment goals	High
	Outcome measures	Standardized tools: BDI, GAD-7, VAS, SF-36	High
Intervention	Therapist qualification	Certified music therapist with proper training	High
	Session frequency	1–2 sessions per week minimum	Moderate
	Duration	8–12-week programs show optimal effects	High
	Method selection	Combined active and receptive approaches	High
Monitoring	Progress evaluation	Regular assessment every 4 weeks	Moderate
	Adverse effects	Monitor for emotional discomfort or overstimulation	Low
Integration	Multidisciplinary care	Coordinate with medical and mental health providers	High
	Long-term planning	Maintenance sessions for sustained benefits	Moderate

4.4. Concluding Clinical Implications

Based on available evidence, MT shows consistent positive effects for depression, anxiety, chronic pain, and neurological rehabilitation. Therapeutic responses are more pronounced when treatments are led by licensed therapists, when methods are personalized, and when active and receptive strategies are combined. This review also highlights promising applications in cardiovascular health and oncology, areas that would benefit from further research. This review article supports the formal integration of MT into clinical protocols – especially for patients with chronic diseases, neurodegenerative conditions, and comorbid psychiatric symptoms. Future research should include economic evaluation, longitudinal follow-up, and the development of standardized interventions that allow for general clinical applicability.

5. CONCLUSION

This review article confirms that MT represents an effective complementary approach in the treatment of chronic and mental illnesses in the adult population. The proven positive effects on depression, anxiety, pain, motor functions, and stress justify a broader clinical application of this intervention.

Key advantages of MT include safety, non-invasiveness, cost-effectiveness, and the possibility of treatment individualization. Although there are methodological limitations in the current literature, the accumulated evidence supports the integration of MT into standard therapeutic protocols.

Future research should focus on development of standardized protocols and assessment tool in MT, evaluation of long-term effects, as well as on investigation of optimal application modalities for specific clinical populations, economic evaluation of music therapy interventions, and exploration of neurobiological mechanisms through neuroimaging studies.

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MUZIKOTERAPIJA KAO PODRŠKA U LEČENJU HRONIČNIH I MENTALNIH BOLESTI: SISTEMATSKI PREGLED SAVREMENIH ISTRAŽIVANJA

Muzikoterapija (MT) predstavlja savremenu terapijsku metodu koja koristi muziku i muzičke elemente za poboljšanje fizičkog i mentalnog zdravlja. Kao komplementarni pristup u medicini, MT se sve više koristi u lečenju hroničnih i mentalnih bolesti, gde doprinosi smanjenju bola, anksioznosti, depresivnih simptoma, kao i poboljšanju kvaliteta života. Ovaj pregledni članak analizirao je 35 studije objavljene između 2020. i 2025. godine. Rezultati pokazuju da MT ima značajne pozitivne efekte, sa standardizovanom srednjom razlikom (SMD) od -0,48 (95% CI: -0,60 do -0,36) za depresiju, -0,44 (95% CI: -0,58 do -0,30) za anksioznost i 0,62 (95% CI: 0,46 do 0,78) za motoričke funkcije u neurorehabilitaciji. Najbolji rezultati se postižu kada intervencije sprovode obučeni terapeuti i kombinuju aktivne i receptivne metode. Iako postoje metodološka ograničenja, nalazi opravdavaju širu integraciju muzikoterapije u kliničke protokole.

Ključne reči: muzikoterapija, hronične bolesti, mentalno zdravlje, depresija, anksioznost, kvalitet života, komplementarne terapije, sistematski pregled