# Systematic Review: The Effectiveness of Music Therapy in Improving Sleep Quality in Insomnia Patients

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## Abstract

Insomnia is a sleep disorder characterized by difficulty initiating or maintaining sleep, or waking too early and being unable to return to sleep. It negatively affects quality of life, cognitive function, and increases the risk of mental disorders such as depression and anxiety. Music therapy, as non-pharmacological approach, is increasingly used due to its safety, minimal side effects, and potential effecttiveness in improving sleep quality. However, its efficacy and underlying mechanisms require further investigation. This systematic review aims to evaluate the effectiveness of music therapy in improving sleep quality among individuals with insomnia, understand its mechanisms of action, and identify the most effective music types for therapeutic use. Literature search was conducted using PubMed and Google Scholar with the keywords "insomnia" OR "sleep disorders" OR "sleep disturbances" AND "music therapy" AND "sleep quality" focusing on studies published between 2015-2025. From 2.073 articles, 11 met inclusions criteria based on PRISMA guidelines. The analysis covered study design, sample, intervention, measurement tools, and outcomes. Music therapy significantly improved sleep quality based on PSQI and ISI scores. Instrumental music without lyrics and with a slow tempo (60-80 bpm) was the most effective in enchancing sleep duration, latency, and quality. Mechanisms include reduced sympathetic nervous activity, enchanced relaxation, and regulation of serotonin and dopamine. Music therapy is an effective non-pharmacological and clinically feasible complementary therapy. Further RCT-based research with objective measures is needed to examine its long-term impact.

**Keyword:** *Insomnia, Sleep Disturbances, Sleep Disorders, Music Therapy, Sleep Quality*

## INTRODUCTION

Insomnia is a sleep disorder characterized by difficulty falling asleep, staying asleep, or waking up too early and being unable to fall back asleep. It is estimated that approximately 10%–

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https://doi.org/10.23887/gm.vxiy.12345
02-09-2025;28-01-2026;05-03-2026; Available online ddmmyy

16% of adults experience chronic insomnia, while up to 20%–30% experience mild or episodic insomnia symptoms.[1] Based on data from the Indonesia Family Life Survey (IFLS-5), which involved 31,432 respondents aged ≥15 years, it was found that 11% of the total respondents experienced clinical insomnia, while another 33% experienced subclinical or episodic insomnia symptoms.[2] This sleep disorder is more common in women, the elderly, and those with low socioeconomic status, and has a negative impact on quality of life, cognitive function, and increases the risk of chronic and mental disorders such as depression and anxiety.[3] These findings confirm that insomnia is a significant public health problem and requires serious attention in its management.

One increasingly popular non-pharmacological approach to treating insomnia is music therapy. Music therapy is considered a safe, easy-to-apply method with minimal side effects. Calming music is known to reduce sympathetic nervous system activity, stimulate relaxation, and balance brain waves, thereby facilitating a more effective transition to sleep.[4,5]

This systematic review aims to evaluate the effectiveness of music therapy in improving sleep quality in people with insomnia. This study also aims to understand the mechanism of music therapy in improving sleep quality and to identify the most effective types of music for treating insomnia. Although several studies have examined the relationship between music and sleep, many previous reviews broadly examined general sleep disturbances without specifically focusing on insomnia populations or analyzing the therapeutic characteristics of music interventions. Unlike previous reviews, this study specifically synthesizes randomized controlled trials in insomnia populations and examines key therapeutic parameters, including tempo, instrumental format, duration of exposure, and underlying neurophysiological mechanisms. This focused oriented approach aims to provide clinically applicable recommendations for music therapy implementation in insomnia management.

## METHOD

This study is a systematic review that aims to analyze the effectiveness of music therapy in improving the sleep quality of insomnia sufferers. Articles were searched for in the PubMed and Google Scholar databases using the keywords *"insomnia" OR "sleep disorder" OR "sleep disturbances" AND "music therapy" AND "sleep quality"*. The search was limited to articles published between 2015 and 2025 to ensure that the data used was relevant and up to date.

The selection of articles referred to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) guidelines, which cover several stages. The first stage was to identify articles in the selected databases using the specified keywords. Next, the articles found were screened based on their titles and abstracts to assess their suitability for the inclusion criteria. After the screening process, the selected articles underwent a feasibility assessment. In this process, all articles found were read and evaluated based on the inclusion criteria: 1) original research articles (quantitative or qualitative) of the Randomized Controlled Trial (RCT) or Quasi-Experimental type, 2) using music therapy as an intervention, 3) human subjects with complaints or diagnoses of insomnia, 4) a minimum sample size of 30 people, and 5) including sleep quality measurements as an outcome. Exclusion criteria: 1) review/theory articles (non-empirical studies), 2) studies on animals or non-clinical laboratory experiments, and 3) articles not available in full-text format.

The literature search strategy used the PICOT approach. Population (P): Insomnia sufferers; Intervention (I): Music Therapy; Comparison (C): Control Group or Other Interventions; Outcome (O): Improvement in Sleep Quality; and Time (T): Articles published within the last 10 years.

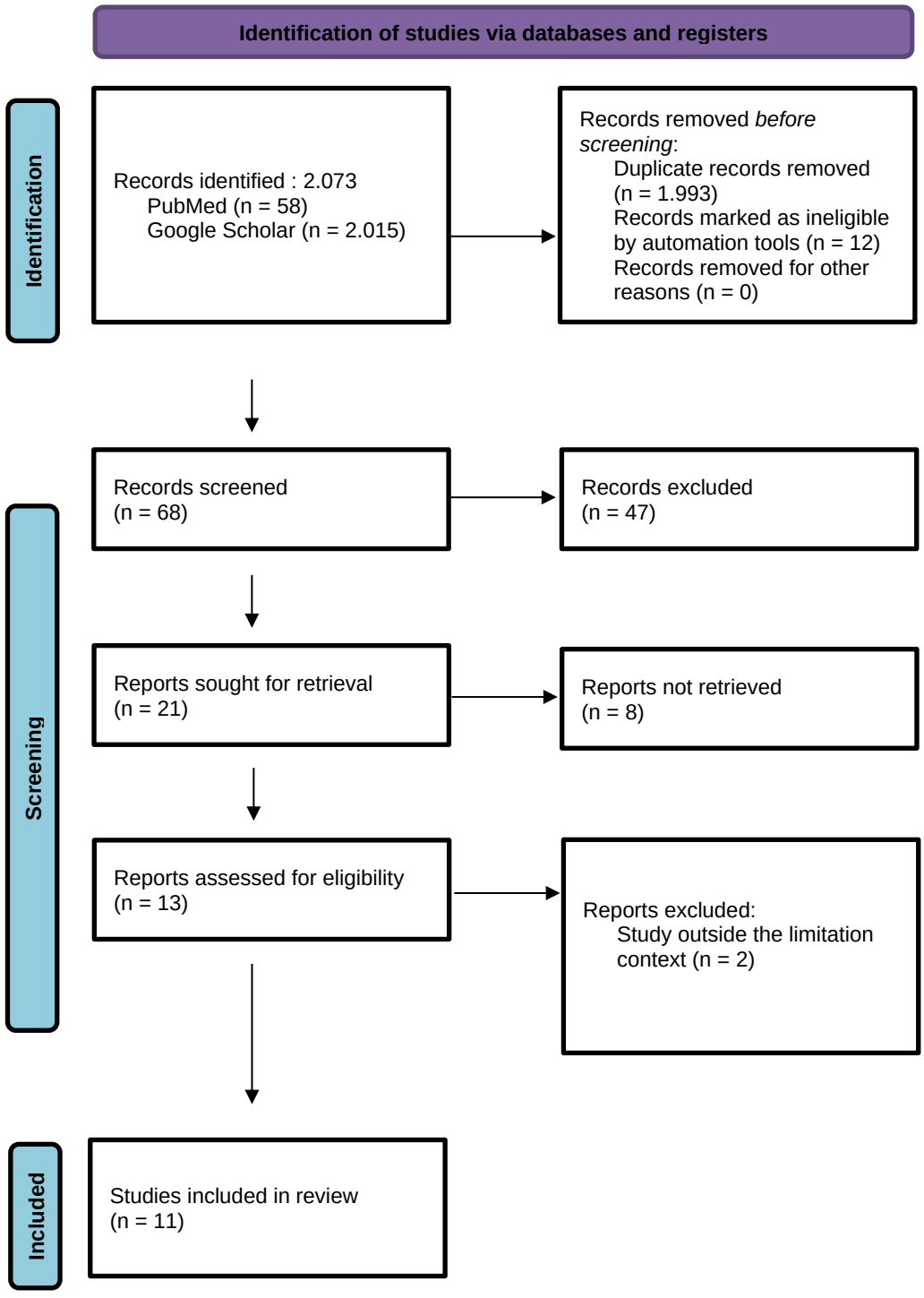


**Figure 1.** PRISMA Flowchart

From the total initial search results, 2,073 articles were identified as meeting the identification criteria. After screening and assessing their suitability, 11 articles that met all the criteria were selected and used as the basis for this study. The results of the analysis are presented in the summary table below.

ISSN 2797-8672
Vol 6 No 1 Th 2026


**Table 1.** Result Finding

| No | Title & Author | Type of Research | Sample & Sampling Technique | Intervention | Instruments | Analysis | Result |
|---|---|---|---|---|---|---|---|
| 1 | Study on the Intervention Effect of Music on Insomnia of College Students. (Dos Santos, 2022) | *Quasi Experiment* | 96 students, *random sampling.* | Listening to music for 30 minutes before bedtime. | *Pittsburgh Sleep Quality Index* (PSQI) | *Paired t-test* | Insomnia decreased significantly after the intervention ($p < 0.05$) |
| 2 | Music and Sleep Hygiene Interventions for Pregnancy-Related Insomnia (Hoegholt et al, 2025) | RCT | 98 pregnant women, *random allocation.* | 30 minutes of music therapy & sleep hygiene before bedtime for 4 weeks. | PSQI & *Insomnia Severity Index* (ISI) | *Analysis of Variance* (ANOVA) | Combined interventions improved sleep quality compared to controls. ($p < 0.001$) |
| 3 | Effects of music and music video interventions on sleep quality (Huang et al, 2017) | RCT | 71 adults with sleep disorders, *random sampling.* | Listening to music/watching relaxation music videos for 30 minutes before bedtime for 4 days. | *Electroencephalography Machine* (EEG) & PSQI | ANOVA | The music and video group experienced improved sleep quality ($p < 0.05$) |
| 4 | A randomized controlled trial of bedtime music for insomnia disorder | RCT | 57 participants with insomnia, *random assignment.* | Listening to music for 30 minutes before | ISI & *Sleep Diary* | ANOVA & *χ2-tests* | Significant reduction in insomnia symptoms ($p < 0.05$) |

| No | Title & Author | Type of Research | Sample & Sampling Technique | Intervention | Instruments | Analysis | Result |
|---|---|---|---|---|---|---|---|
| | (Jespersen et al, 2019) | | | bedtime for 4 weeks. | | | |
| 5 | Effect of music therapy on sleep quality (Kavurmacı et al, 2020) | *Quasi Experiment* | 50 students, *convenience sampling*. | Music therapy for 1 hour before bedtime for 1 week. | PSQI | *χ2 analysis & t-test* | Significant improvement in sleep quality after therapy ($p < 0.001$) |
| 6 | Sleep-aiding music therapy for insomnia: Exploring EEG functional connectivity (Li et al, 2024) | Quantitative Experiment | 30 insomnia patients, *purposive sampling*. | Therapy with 6 types of music while undergoing dot probe and EEG Functional Connectivity measurements. | EEG & *Dot-probe task* | Comparative analysis of FC EEG and attention bias before and after music therapy | Significant changes in FC EEG and attention bias after listening to music. (p-values were not explicitly stated) |
| 7 | Music to improve sleep quality in adults with depression-related insomnia (MUSTAFI) (Lund et al, 2023) | RCT | 112 adult patients with depression-related insomnia, *random allocation*. | Listening to music before bed for 30 minutes for 4 weeks. | PSQI & *Actigraphy* | PSQI score comparison in week 4 & 8 | At 4 weeks, significant improvement in sleep quality according to PSQI with *effect size* = −2.1 (95 % CI: −3.3, −0.9) in the music group, indicating improved sleep quality |

| No | Title & Author | Type of Research | Sample & Sampling Technique | Intervention | Instruments | Analysis | Result |
|---|---|---|---|---|---|---|---|
| | | | | | | | compared to the control group.<br>*At 8 weeks (4 weeks after intervention cessation): effect diminished to effect size* = −0.1 (95 % CI: −1.3, 1.1) |
| 8 | Effects of music listening on stress, anxiety, and sleep quality for sleep-disturbed pregnant women (Liu et al, 2016) | RCT | 121 pregnant women with sleep disorders, *random sampling*. | Listening to one of the selected music tracks for 30 minutes before bed for 2 weeks. | PSQI, *Perceived Stress Scale* (PSS), *State Anxiety Inventory* (STAI) | *Analysis of Covariance* (ANCOVA) | Significant improvement in sleep quality and reduction in stress and anxiety. PSQI ($t = 6.22$, $p < 0.01$) STAI ($t = 2.11$, $p < 0.05$) |
| 9 | Yu Melody + Jianpi Jieyu Decoction for Insomnia (Pang et al, 2025) | RCT | 94 insomnia patients, *random allocation*. | 'Yu Melody' music relaxation training + traditional herbal 'Jianpi Jieyu Decoction' for 4 weeks. | ISI, PSQI, PHQ-9 & GAD-7 | *Chi-square & t-test* | The decrease in ISI scores at week 4 in the intervention group was greater than in the control group, with an intergroup difference of to −3.2 points *(95% CI: −5,08* to *−1,34)*, ($p < 0.05$) |

| No | Title & Author | Type of Research | Sample & Sampling Technique | Intervention | Instruments | Analysis | Result |
|---|---|---|---|---|---|---|---|
| 10 | Bedtime music therapy for college students with insomnia (Yan et al, 2024) | RCT (Assessor-blinded) | 75 students, *random assignment*. | Listening to music before bed for at least 30 minutes for 5 weeks. | PSQI & ISI | ANOVA | Insomnia symptoms decreased significantly compared to the control group ($p < 0.05$) |
| 11 | A randomized trial of CES integrated with music on sleep improvement (Zhang et al, 2025) | RCT | 90 participants with sleep disorders, *random sampling*. | Combination of Cranial Electrotherapy Stimulation (CES) therapy + music therapy for at least 30 minutes for 2 weeks. | *Self-Rating Scale of Sleep* (SRSS) & PSQI *combined with Actigraphy* | ANOVA & *χ2 - tests* | There was a significant improvement in sleep quality in the intervention group compared to the control group ($p < 0.05$) |

## RESULT & DISCUSSION

This systematic review consistently shows that music therapy improves sleep quality in individuals with insomnia. Improvements were observed in aspects such as sleep latency, sleep duration, and overall perceived sleep quality. These outcomes were measured using validated instruments such as Pittsburgh Sleep Quality Index (PSQI) and Insomnia Severity Index (ISI).[6-8] Most interventions, involving 2–5 weeks of music listening for approximately 30 minutes before bed, showed significant improvements.[9]

Music promotes optimal physiological conditions for sleep by decreasing sympathetic nervous system activity and increasing parasympathetic nervous system activity.[6] Additionally, music modulates neurotransmitters, such as dopamine and serotonin pathways, which can help stabilize mood and reduce anxiety. The potential of music therapy as a supportive therapeutic approach is enhanced when clinical outcomes are combined with underlying neurophysiological principles. Neurophysiological processes involved modulation of autonomic nervous system activity and brainwave regulation. Slow-tempo instrumental music (60–80 bpm) is associated with increased alpha and theta brainwave activity, which aids relaxation and transition to sleep.[10-13] Several studies indicate that music selected based on the patient's personal preferences can enhance the effectiveness of therapy, as long as it meets the rhythmic characteristics that can promote relaxation.[14,15]

To our knowledge, this review is among the few recent systematic syntheses that specifically focus on clinically diagnosed insomnia populations while identifying practical therapeutic parameters such as tempo range, intervention duration, instrumental characteristics, and proposed neurophysiological mechanisms. Previous reviews often combined multiple sleep disorders or heterogeneous populations, thus limiting their direct clinical applicability. By narrowing the population and implementing a repeatable intervention pattern, this study provides more actionable recommendations for clinical practice than simply confirming general effectiveness. This focused synthesis enhances relevance and supports the integration of music therapy into structured insomnia management programs.

The studies we reviewed were conducted in a variety of research settings, including university-based samples, hospital-based clinical populations, and community settings. This diversity enhances external validity and demonstrates the applicability of music therapy across demographic groups. However, important contextual differences need to be considered. Studies with university-based samples predominantly involved younger participants with fewer comorbidities, which may limit generalizability to older individuals or patients with complex medical conditions. In contrast, hospital-based studies included participants with comorbid conditions such as depression or pregnancy-related insomnia, increasing clinical relevance but also introducing potential confounding variables. Furthermore, most interventions were delivered in controlled research settings rather than routine primary care settings. Therefore, while efficacy appears promising, the feasibility and sustainability of real-world implementation remain areas requiring further research.

These results reinforce the growing acceptance of music therapy as an adjunct treatment for insomnia, particularly for patients who prefer non-pharmacological methods. Rather than focusing

on general sleep problems, this review addresses the insomnia population exclusively, adding to previous research. This analysis examined current randomized controlled trials and found consistent therapeutic features, such as tempo characteristics, instrumental format, and intervention duration, in contrast to previous evaluations that examined music and sleep in general. Furthermore, the findings are more practically applicable to clinical practice when mechanistic explanations are combined with therapeutic outcomes. The research presented in this review was conducted in a variety of contexts, including community samples, hospital patients, and university groups. This diversity enhances external validity and demonstrates how music therapy can be used across different demographics and settings.

However, most interventions were implemented in structured research settings rather than routine primary care settings. Therefore, even if there is evidence to support their efficacy, further research is required to assess their practicality. Patients who prefer non-pharmacological methods or want to reduce long-term hypnotic use may benefit most from music therapy. To support evidence-based recommendations, further high-quality randomized studies with objective sleep measures and established intervention methods are required.

The inclusion of a large number of randomized controlled trials, adherence to PRISMA guidelines, and the review's emphasis on clinically relevant therapeutic parameters may help improve practical implementation for healthcare providers. Nevertheless, several limitations should be acknowledged. This review was conducted as a qualitative systematic synthesis without meta-analysis due to heterogeneity in study designs, intervention protocols, and outcome measures. A formal risk of bias assessment tool was not applied, which may limit the evaluation of internal validity. Furthermore, most studies relied primarily on subjective sleep measurements, with limited use of objective assessments such as polysomnography or actigraphy. Variability in participant characteristics and intervention duration may also impact the generalizability of the findings.

## CONCLUSION

Music therapy has been proven as an effective complementary intervention in improving sleep quality in insomnia patients. Music therapy helps accelerate sleep latency, prolong sleep duration, and improve sleep quality. Slow tempo, instrumental music played for approximately 30 minutes before bedtime appears to yield consistent benefits in reducing sleep latency and enchancing subjective sleep quality. The mechanism of action of music therapy is closely related to neurophysiological and psychological effects that promote relaxation and reduce anxiety, which are major obstacles to the sleep process. Music therapy can be used as a recommended non-pharmacological intervention in the management of insomnia, especially in patients who want to avoid the side effects of sleeping pills. Standard guidelines regarding the duration, frequency, and type of music used in music therapy for insomnia need to be developed so that this intervention can be more measurable and effective. More experimental research with RCT designs and objective measurements of sleep quality (such as polysomnography) is needed to strengthen the scientific evidence regarding the effectiveness and mechanisms of music therapy in improving the sleep quality of insomnia patients.

## COMPETING INTERESTS

The author declares that there is no conflict of interest in any form related to the writing and publication of this article.

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