Music therapy improves sleep quality in acute and chronic sleep disorders: a meta-analysis of 10 randomized studies

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CRD summary

This review concluded that music appeared to be effective for acute and chronic sleep disorders. However, positive results were observed only when subjective measures of sleep quality were used. The included trials were diverse, had small samples and were relatively low quality. Given these limitations, the authors' conclusions may not be reliable and long-term effects remain unknown.

Authors' objectives

To evaluate the efficacy of music therapy for acute and chronic sleep disorders in adults.

Searching

PubMed, EMBASE and The Cochrane Library were searched without language restriction. Search terms were reported but search dates were not. Reference lists of original and review articles were checked for additional relevant studies.

Study selection

To be eligible, studies had to be randomised controlled trials (RCTs) that involved adults (over 18 years of age) who used music in a passive way to improve sleep quality. Sleep quality could be assessed using subjective methods (such as questionnaires) or objective methods (such as polysomnography). From the sleep measures provided by polysomnography, the outcome of sleep efficiency (total sleep time/total recording time) was selected as the primary outcome. Trials were excluded if participants were suffering neurological or severe cognitive disorders, or if the music involved active participation such as playing instruments.

The mean age of participants ranged from 23 to 76 years across the trials; the distribution of male and female participants varied. Trials that focused on post-operative acute sleep disorders in hospital after surgery and trials that focused on chronic sleep disorders were included. Populations with chronic sleep disorders included abused women in a shelter, university students, and the general community. Trials took place across the world including USA, Italy, Austria, Hungary, Taiwan, Hong Kong and South Korea. Most trials used subjective sleep measures.

Trials were assessed independently by two reviewers with any uncertainty or disagreement resolved by discussion and consensus.

Assessment of study quality

Trials were assessed for randomisation, blinding, reporting of withdrawals, generation of random numbers and concealment of allocation. The possible score was from 0 up to 5.

It was unclear how many reviewers were involved in the assessment of study quality for the review.

Data extraction

Data were extracted using a standardised protocol and data extraction form. Continuous data from the different measurement scales were extracted and expressed as standardised mean differences with 95% confidence intervals.

It was unclear how many reviewers were involved in the extraction of data for the review.

Methods of synthesis

Combined standardised mean differences were calculated using fixed-effect models or random-effects models if significant heterogeneity was present. A standardised mean difference of 0.2 indicated a small effect size, 0.5 a moderate one, and 0.8 a large one. Statistical heterogeneity was assessed using the Q statistic and I^2 ($I^2>50\%$ indicated statistical heterogeneity).

Sensitivity analysis was conducted by omitting each trial in turn from the analysis. Subgroup analyses were conducted to

explore heterogeneity in age, geographical location, follow-up duration, acute or chronic sleep disorder, and subjective or objective sleep quality assessment methods.

Publication bias was assessed with funnel plots and Egger's test.

Results of the review

Ten RCTs with 557 participants (648 participants in table 1) were included in the review. Trials scored from 2 to 4 out of 5 for quality. Follow-up duration was less than four days for the hospital trials and from three to four weeks for trials of chronic sleep disorders.

The quality of sleep was improved significantly by music (SMD -0.63, 95% CI -0.92 to -0.34; 10 RCTs) with statistically significant heterogeneity (I^2=64%). Similar effects were shown with acute (SMD -0.74, 95% CI -1.13 to -0.34; I^2=56%; four RCTs) and chronic (SMD -0.55, 95% CI -0.99 to -0.11; I^2=71%; six RCTs) sleep disorders. There was no evidence of publication bias.

Exclusion of any individual trial did not substantially alter the results. Subgroup analyses showed similar results for geographical location, average age of participants, and whether or not they were hospitalised. Sleep quality was only statistically significantly improved in trials with a follow-up duration shorter than four days or longer than three weeks, and in trials that used subjective methods of assessing sleep quality.

Authors' conclusions

Music appeared to be effective in treating acute and chronic sleep disorders and showed a cumulative dose effect for chronic sleep disorders.

CRD commentary

This review was based on broadly defined inclusion criteria for participants, interventions and outcomes. A range of sources were searched but search dates were not reported. Publication bias was assessed. It was unclear whether more than one reviewer was involved in the processes of data extraction and quality assessment, which could help to minimise bias and error.

Trial quality was assessed but results were not presented in full. It was unclear if statistical pooling was appropriate given the variation in the populations, nature of sleep disorders and outcome measures. The authors conducted subgroup analyses to investigate heterogeneity, but the influence of other variables not investigated cannot be excluded. The authors' conclusion on cumulative dose of music therapy could not be verified from the data provided. The authors acknowledged the heterogeneity, small sample sizes, relatively low trial quality, and short term results.

Although the authors observed that music showed positive results for sleep disorders, this was only evident when subjective measures were used. Given these limitations, the authors' conclusions may not be reliable and long-term effects remain unknown.

Implications of the review for practice and research

Practice: The authors did not state any implications for practice.

Research: The authors stated that the efficacy of music for sleep disorders should be tested in larger studies that keep acute and chronic populations separate. There was a need to compare different types of music on sleep and to develop a list of recommended pieces of music to suit individual preferences. Further research was also needed to determine the preferred duration of music playing, the appropriate time to play the music before bedtime, and how to create an atmosphere conducive to listening to music. Follow-up of more than three weeks would be necessary to assess the efficacy of music.

Funding

None.

Bibliographic details

Wang CF, Sun YL, Zang HX. Music therapy improves sleep quality in acute and chronic sleep disorders: a meta-analysis of 10 randomized studies. International Journal of Nursing Studies 2013; 51(1): 51-62

PubMedID
23582682

DOI
10.1016/j.ijnurstu.2013.03.008

Indexing Status
Subject indexing assigned by NLM

MeSH
Acute Disease; Chronic Disease; Humans; Music Therapy; Randomized Controlled Trials as Topic; Sleep Wake Disorders /therapy

AccessionNumber
12013020517

Date bibliographic record published
24/04/2013

Date abstract record published
16/09/2013

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.