

Abstract

Name: The effects of binaural beats on sleep quality: a systematic review

Aims of the study: The main objective of this study is to present the possibilities of influencing stress and sleep, to determine the effect of binaural beats (BB) stimulation on sleep quality and parameters, and to determine the specifics of effective BB therapy based on the available data.

Materials and methods: This systematic review includes scientific articles and clinical studies published in relevant and/or peer-reviewed journals and conference proceedings. Three electronic databases (Web of Science, Scopus, PubMed) were searched for all available sources published from 2000 to January 2023 in English language. The search was conducted using relevant keywords and their combinations. The screening and subsequent process of elimination was based on set of eligibility and inclusion criteria.

Results: Total of fourteen studies met the eligibility criteria. BB stimulation increased subjectively perceived sleep quality and reduced mental tension. Objectively, it reduces time of falling asleep, accelerates the onset of deeper sleep stages (N2 and N3) and increases their duration, as well as the total sleep time. The parameters optimal for effective BB stimulation can be laid out as follows: BB in the frequency range of 2 to 4 Hz, corresponding to delta oscillations, carried by tones of frequencies around 250 Hz and lower, possibly on a white or pink noise background. Stimulation should last for at least 30 minutes and should take place at times around the onset of sleep, i.e. just before, during and possibly during sleep. The different parameters are discussed in the paper.

Conclusions: BB stimulation proves to be an effective method for improving sleep quality and could thus represent an alternative to pharmacotherapy. It is non-invasive, easily accessible and relatively inexpensive, but its potential limitations and shortcomings must be also considered.