European Journal of Integrative Medicine 17 (2018) 86–91

Contents lists available at ScienceDirect

European Journal of Integrative Medicine

journal homepage: www.elsevier.com/locate/eujim

Comparing the effect of listening to music during hemodialysis and at bedtime on sleep quality of hemodialysis patients: A randomized clinical trial

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ARTICLE INFO

Keywords:
Music
Sleep quality
Hemodialysis patients
Randomized controlled trial

ABSTRACT

Introduction: Poor sleep quality is a common problem among hemodialysis patients which could lead to a decrease in their quality of life. The aim of this study is to determine and compare the effect of listening to music during hemodialysis and at bedtime on the sleep quality of hemodialysis patients.

Methods: This research is a randomized clinical trial with a pre-post-test design. A total of 150 patients undergoing hemodialysis in three educational hospitals in Shiraz, southern Iran were assigned to one of three groups by block randomization. The first intervention group listened to music during hemodialysis, and the second group listened to music at bedtime. The intervention continued for 4 weeks. The control group (the third group) received no intervention. Sleep quality was measured by the Pittsburgh Sleep Quality Index (PSQI) during two stages (before and one week after the intervention). Data were analyzed by the software SPSS version 21.

Results: The results of ANOVA and Tukey's post hoc test showed that there were significant differences in the mean change in the total score on the PSQI before and after the intervention between both intervention groups and the control group and between the two intervention groups ($p < 0.05$). Significant differences were also seen in the PSQI subscales, except sleep sufficiency ($p < 0.05$).

Conclusion: Music can improve the sleep quality of hemodialysis patients. Listening to music at bedtime is more effective than during hemodialysis in this regard. This safe and inexpensive intervention may be recommended to decrease sleep problems in these patients.

1. Introduction

Although hemodialysis (HD) can decrease the signs and symptoms of chronic renal failure and increase patients' life expectancy [1–3], these patients face numerous psychological problems as well as various physiological changes that affect their quality of life [4,5]. One of the problems facing HD patients is poor sleep quality [6,7]. Some studies show that more than 80% of chronic renal failure patients suffer from sleep disorders [8]. Common sleep disorders in these patients are insomnia (69%), obstructive sleep apnea syndrome (24%), restless leg syndrome (18%), nightmares (13%), excessive daytime sleepiness (12%), somnambulism (4%), and narcolepsy (1%) [8,9].

Sleep quality is a subjective experience, which relates to mental indices such as satisfaction with sleep and feeling rested after waking [10]. Sleep quality is generally related to the functioning of the hypothalamic-pituitary-adrenal (HPA) axis, which plays a crucial role in sleep regulation [11,12]. Hormonal changes along the HPA axis that appear in some conditions, such as stress, anxiety, and depression, can negatively affect sleep quality [13,14].

Insufficient or disrupted sleep has negative effects on quality of life and can reduce daytime function [15]. On the other hand, sleep disturbances cause physical and psychological complications. Poor sleep quality reduces satisfaction and quality of life by increasing anxiety, irritability, and confusion [16,17].

Various methods are used to improve sleep quality. Sedative prescription is the most common treatment [18], but these medicines reduce sleep disturbances temporarily and are only effective in short-term treatments. Moreover, most of them increase sleep duration rather than sleep quality and reduce rapid eye movement (REM) sleep, which is necessary for cognitive function and relaxation [19]. Therefore, nowadays, non-pharmaceutical and complementary methods are considered with increasing frequency. Studies have shown the effect of

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https://doi.org/10.1016/j.eujim.2017.12.001
Received 20 September 2017; Received in revised form 2 December 2017; Accepted 7 December 2017

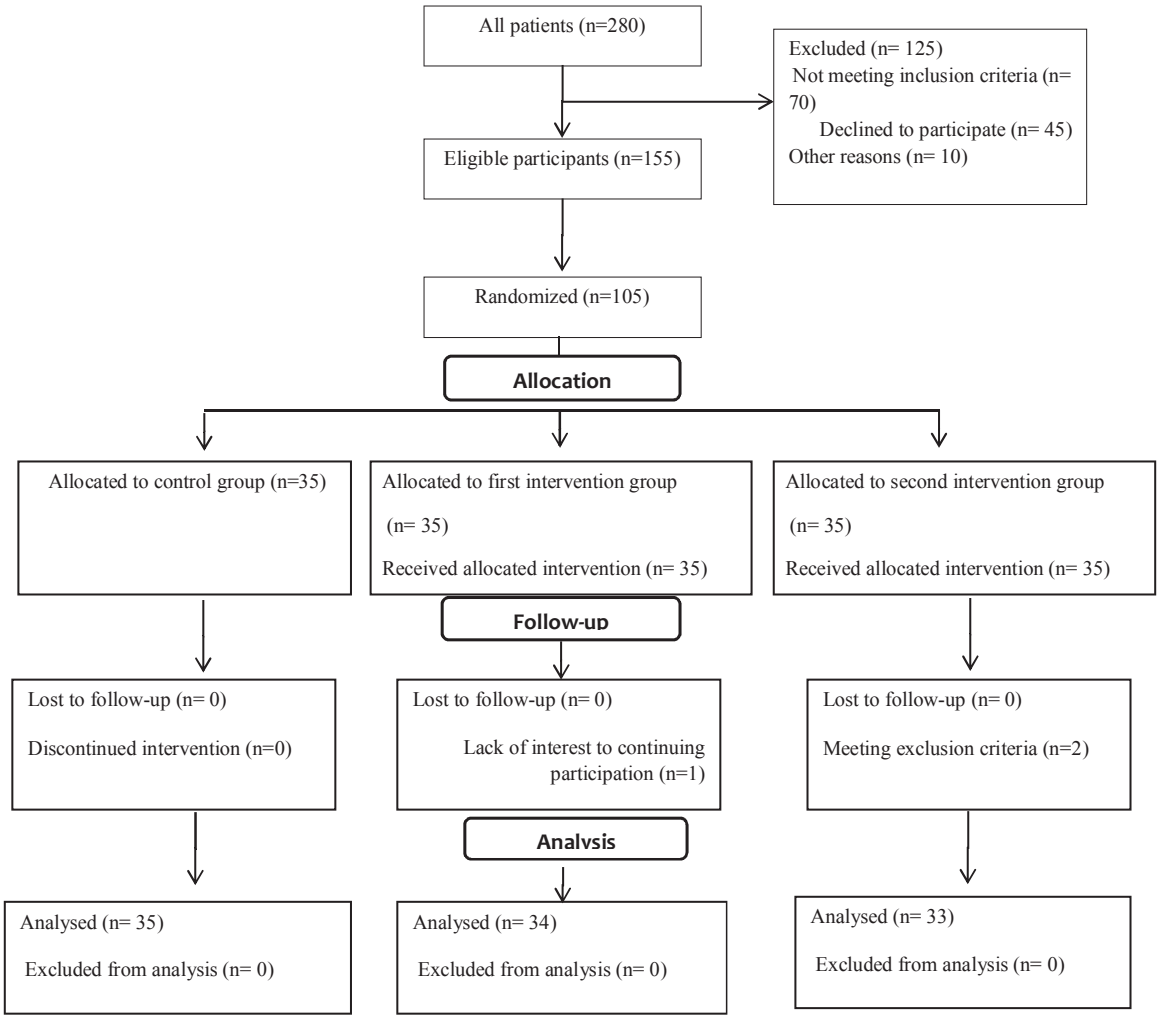

Fig. 1. Flow of participants.

meditation [20], aromatherapy [21], Hatha yoga exercise [22], acupressure [23], relaxation techniques [24], etc. in improving sleep quality.

One of the complementary methods for improving sleep quality is the use of music. Some studies report a positive effect of music on reducing anxiety [25–27] and pain [26,28,29] and improving physiological responses [30]. Music intervention also has a positive effect on the sleep quality of patients who have acute and chronic conditions [31–34]. Music has the potential to reduce anxiety, improve conditions prior to sleep, and provide relaxation and comfort, which might affect the quality of sleep [34–38].

Music listening as a noninvasive, pleasant, simple, and inexpensive intervention is used by nurses to improve patients' sleep quality [31,37] and can reduce the costs and complications of conventional treatments [38–40]. In addition to physiological and psychological benefits, music may address patients' spiritual needs, because it is sometimes considered from a spiritual perspective [41], which is important for holistic care.

Few studies have examined the effect of music on sleep quality in HD patients. They often studied the effect of listening to music before night sleep [42–44]. The aim of this study was to compare the effectiveness of music therapy during hemodialysis and at bedtime on sleep quality in HD patients. Three hypotheses were tested in this research:

The sleep quality of hemodialysis patients who listen to music during hemodialysis is better than that of the control group.

The sleep quality of hemodialysis patients who listen to music at bedtime is better than that of the control group.

There is no difference in the sleep quality between HD patients who listen to music at bedtime and those who listen to music during hemodialysis.

2. Methods

2.1. Design and setting

This study was a randomized, controlled clinical trial with a pre-post-test design that was conducted from May to December 2016. The setting was hemodialysis centers of three educational hospitals affiliated with Shiraz University of Medical Sciences (SUMS) in Shiraz, southern Iran.

2.2. Participants

The inclusion criteria of this study were: age between 18 and 60 years; a history of hemodialysis for at least 6 months, with at least two and a maximum of three dialysis sessions weekly; no history of severe sleep disturbances; no history of hearing disturbances or being partially deaf, mental illnesses, or advanced cardiopulmonary disease; and no drug addiction. The exclusion criteria were: major physical or mental events during the study and not listening to music more than two times in a week for the second intervention group (listening to music at bedtime).