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The effects of sedative music on sleep quality of older community-dwelling adults in Singapore



Angela Shum^a, Beverley Joan Taylor^b, Jeff Thayala^c,
Moon Fai Chan^{a,*}

^a Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

^b Faculty of Medicine, Nursing and Health Sciences, School of Nursing and Midwifery, Monash University, Gippsland Campus, Churchill, Victoria, Australia

^c Department of Nursing Administrations, Institute of Mental Health, Singapore

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KEYWORDS

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Summary

Objectives: To examine the effects of music listening on sleep quality amongst older community-dwelling adults in Singapore.

Methods: In a randomized controlled study, a cohort of older adults ($N=60$) age 55 years or above were recruited in one community centre. Sleep quality, as measured by the Pittsburgh Sleep Quality Index (PSQI), was the primary outcome. Participants' demographic variables including age, gender, religion, education level, marital and financial status, any chronic illness, previous experiences of music intervention as well as depression levels were collected. Participants were asked to listen to soft, instrumental slow sedative music without lyrics, of approximately 60–80 beats per minute, and 40 min in duration, for 6 weeks. Generalized estimating equations were used to examine the effects of the intervention on the elders' sleep quality.

Results: Significant reductions in PSQI scores were found in the intervention group ($n=28$) from baseline (mean \pm SD, 10.2 ± 2.5) to week 6 (5.9 ± 2.4 , $p < 0.001$), while there were no changes in the control group ($n=32$) from baseline (9.0 ± 2.4) to week 6 (9.5 ± 2.6). At week 6, the intervention group showed a better sleep quality than the control ($\chi^2 = 61.84$, $p < 0.001$).

Conclusions: Notwithstanding the placebo effect, this study supports music listening as an effective intervention for older adults to improve sleep quality. Not only does this process improve their sleeping quality at old age, it also individualizes and enhances the quality of care provided by the healthcare provider as the therapeutic relationship between provider and client is being established. Contemporary gerontology is progressively characterized by collaboration between several approaches with the intent to comprehend the mental aspects of the multifarious process of ageing. Music listening is one such avenue to enhance sleep quality amongst older adults and make an essential contribution to healthy ageing.

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* Corresponding author. Tel.: +65 6516 8684.

E-mail address: nurcmf@nus.edu.sg (M.F. Chan).

Introduction

Sleep disturbances have been recognized as a significant and growing cause for public health concern.¹ Even though it is known to affect all age groups, prior research has suggested that older adults are of greater vulnerability to sleep problems.² Previous epidemiological studies have indicated that sleep complaints like sleep fragmentation and daytime sleepiness affected approximately 35% of the general population,³ and up to 50% of the older adults.⁴ Sleep disturbances contribute to insufficient or ineffective sleep patterns, which are known to heighten the risk for adverse consequences like cognitive impairment, falls, and deterioration in physical functioning.^{1,5,6} Currently, pharmacotherapy is the main form of remedy to alleviate sleep disturbances and improve sleep quality.⁸ However, these medications are associated with psychological and physiological side effects that can affect daily activities and functioning of individuals. The use of these drugs can also lead to tolerance and dependence.⁹ As prior research has yet to establish the safety and efficacy of these pharmacological measures,¹⁰ sleep scientists have recommended exploring non-pharmacological techniques with a mind-body interaction to promote sleep.¹¹ A range of non-pharmacological interventions are available as alternative treatments for sleep disturbances. They include cognitive behavioural treatments,¹² bright light therapy,¹³ and neurofeedback.⁷ However, the feasibility of these interventions is questionable, as they often require large investments of time for training purposes.¹⁴ As such, music intervention is identified by the researchers as an area of interest as it is relatively inexpensive, readily available and can be easily self-administered.¹⁵

A meta-analysis of five randomized controlled trials (RCT) conducted with relevance to this topic reported a significant effect of music listening on sleep quality for all age groups in general.¹⁴ Generalized findings on the effectiveness of music listening on sleep quality are shown to be optimistic. However, these findings must be interpreted with caution, as all of these studies were conducted in different populations and settings.¹⁴ In reference to the elderly population, the effects of music on their sleep quality remains uncertain due to the limited studies conducted. Despite its potential benefits, no systematic review has been conducted to evaluate the effectiveness of music on sleep quality for older populations. To date, only five related studies,^{16–20} were found, of which only one was a RCT study with a sole focus on music listening for older adults.¹⁶ Other studies conducted to investigate the effectiveness of music listening on sleep quality were focus on older females,¹⁷ female students,^{19,21} and patients with insomnia,²² but all studies clearly indicated continuous improvement in sleep across the time span of the applied intervention.^{16–18,20,21,23–25} The intervention period of these studies ranged from 10 days¹⁷ up to 45 days.²³

Aim

The aim of this study was to investigate the effects of music listening on sleep quality amongst older community-dwelling adults in Singapore. The hypothesis for this study was that older adults who participate in a music intervention group

will report better sleep quality scores, as measured by the Pittsburgh Sleep Quality Index (PSQI), 6 weeks after the intervention, compared with non-music (control) group.

Methods

Design and participants

This research was a RCT conducted at the participants' homes from January 2012 to January 2013. A cohort of community-dwelling older adults was recruited in one community centre in Singapore. Inclusion criteria were (1) aged 55 years or older,³⁰ (2) living within the selected area of northern part of Singapore, (3) non-institutionalized during the study period, (4) physically capable of completing psychological assessment, (5) able to understand and communicate in either English or Mandarin and give written consent, and (6) have a poor sleep quality, measured by the PSQI, with a score of 6 or above.²⁶ Exclusion criteria were (1) a medical diagnosis of any abnormal cognitive function, such as Parkinson's disease or dementia, and (2) hearing difficulties.

The required sample size was based on an expected effect size of sleep quality levels post-intervention. de Niet et al.¹⁴ conducted a meta-analysis and results suggested that music intervention has a moderate effect on sleep quality in five RCT studies. In relation to effect size, the nQuery Advisor software²⁷ shows that at least 30 participants with complete data per group would be needed to detect an effect with 80% power and 5% significance. Approval to conduct the current study was sought and obtained from the Institutional Review Board ethics committee. Written informed consent was obtained from each participant before obtaining their baseline PQSI scores.

The measurements

The instrument was presented in both English and Chinese and consisted of two parts. Part one collected participants' demographic variables including age, gender, religion, education level, marital and financial status, and any previous experience of music interventions, any chronic illness as well as depressive symptoms, as measured by the Geriatric Depression Scale (GDS-15).²⁸ Part two collected data on participants' sleep quality, as measured by the PQSI. The PQSI is a self-rated questionnaire which assesses sleep quality and disturbances over a period of time. The PSQI was chosen to measure the quality of sleep in older adults because it has a good overall reliability coefficient ($\alpha = 0.83$).³⁵ It has been used in previous studies investigating the effects of music on the quality of sleep.^{36,37} It is divided into several components that assess subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The sum of scores ranges from 0 to 21, and a score of 6 or above indicates a poor sleep quality.²⁶ All participants had the options to choose either English or Chinese instruments. For participants in the intervention group, data were collected at baseline before the music intervention at week 1, and after the music intervention in weeks 2–6, once a week for a total of six times, including the baseline. For participants in the

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