Effect of Passive Music Therapy on Sleep Quality in Elderly Nursing Home Residents

Huzurevinde Kalan Yaşlılarda Pasif Müzikoterapinin Uyku Kalitesine Etkisi

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SUMMARY

Objectives: This one-group, pretest–posttest quasi-experimental study was conducted among elderly nursing home residents to determine their quality of sleep and the effect of passive music therapy given at bedtime on sleep quality.

Methods: The study comprised 31 people aged 64–91 years. Exclusion criteria were severe hearing impairment or memory problems. Inclusion criteria were the ability to answer questions unassisted and no dosage change in current medicines during the study period. Data were collected at the beginning of the research study and after three weeks of passive music therapy using a questionnaire and the Pittsburgh Sleep Quality Index (PSQI). Data were evaluated using numbers, percentages, averages, paired t-test, Mann–Whitney U-test, and Kruskal–Wallis test.

Results: The study found that the average age of the elderly subjects was 81.0±8.49 years; before passive music therapy was initiated, their PSQI score was 5.19±1.75, and after passive music therapy, it was 4.41±1.60. According to these results, subsequent passive music therapy lowered average PSQI scores significantly (p=0.03).

Conclusion: The study found that passive music therapy given at bedtime to elderly subjects has positive effects on the quality of sleep.

Keywords: Elderly nursing home residents; music therapy; sleep; sleep disorders; sleep quality.

ÖZET

Amaç: *Bu araştırma özel bir huzurevinde kalan yaşlıların uyku kalitelerini saptamak ve akşam yatmadan önce uygulanan pasif müzikoterapinin uyku kalitesine etkisini belirlemek amacıyla öntest sontest tek gruplu yarı deneysel olarak yapıldı.*

Gereç ve Yöntem: *Bellek sorunu ve ağır işitme kusuru olmayan, soruları bağımsız olarak yanıtlayabilen, müzik dinletilen süreç içerisinde daha önce kullanılan ilaçların dozunda değişiklik yapılmayan 31 yaşlı birey örneklemi oluşturdu. Veriler, araştırmanın başında ve üç hafta boyunca uygulanan pasif müzikoterapi sonrasında, 'Anket Formu' ve 'Pittsburg Uyku Kalitesi İndeksi' (PUKİ) ile toplanmıştır. Veriler; sayı, yüzdelik, ortalamalar, eşleştirilmiş t testi, Mann Whitney U testi ve Kruskal Wallis testi ile değerlendirildi.*

Bulgular: *Yaşlıların yaş ortalaması 81.0±8.49 olup, yaşlılarda pasif müzikoterapi öncesi PUKİ puanı 5.19±1.75; pasif müzikoterapi sonrası PUKİ puanı 4.41±1.60 olarak saptandı. Buna göre pasif müzikoterapi sonrası PUKİ puan ortalaması, pasif müzikoterapi öncesi PUKİ puan ortalamasına göre düşük bulundu (p=0.03).*

Sonuç: *Yaşlılarda akşam yatmadan önce uygulanan pasif müzikoterapinin uyku kalitesi üzerine olumlu etkileri olduğu saptandı.*

Anahtar sözcükler: Huzurevinde kalan yaşlılar; müzik terapi; uyku; uyku sorunları; uyku kalitesi.

Introduction

The elderly population continues to increase throughout the world. According to Turkish Statistical Institute data, in 2013 the elderly population increased to 7.7% (www.tuik.gov.tr, accessed November 18, 2014). Old age is a period when many physical and psychological problems can arise. Along with dysfunction of organs and systems, sleep, which has significance for life, is influenced by the aging process.[1]

It is unknown whether sleep disorders in the elderly stem from individual differences or the aging process.[2] Epidemiological studies have found that sleep disorders increase with increasing age, and that elderly residents of institutions are more likely to suffer from sleep disorders than those living in private homes.[3–5]

Widely known symptoms of sleep disorders in the elderly include difficulty falling or staying asleep, waking up too early in the morning, and excessive daytime sleepiness. [6–8] Daytime sleepiness, fatigue, irritability, anxiety, depression, muscular fasciculation, heightened sensitivity to pain, decreasing mental function, and deterioration in general health and functioning can develop when sleep disorder is not treated. Sleep disorders can lead to reduced quality of life and increased mortality rate in otherwise healthy elderly people.[9]

Music therapy is a managed treatment method that is administered in an organized way to optimize the psychological and physical effects of musical voices and melodies to treat various mental disorders.[10] Music is a widespread method used to treat diseases in Turkish societies and in many other

cultures.[11,12] It is stated that music can relieve physical ailments by lowering heart rate, body temperature, blood pressure, and respiratory rate.[13,14]

One frequently applied music treatment method is passive music therapy. During passive music therapy, people are made to listen Maqams (melodic modes), which are chosen by the person, accompanied by a relaxing rhythm and the sounds of water while the person is in a resting position, comfortably sitting or lying down.[12] Some purposes of music therapy are to alter mood and decrease stress, pain, and anxiety levels, thereby relieving them. Hence, music therapy can increase quality of life and help people to express themselves more freely.[14–16] Limited studies have assessed the effects of music therapy on sleep quality, though these studies have shown that music therapy has a palliative effect on sleeplessness.[14,17–19]

Elderly people need regular sleep to protect their body's functions and to sustain their quality of life in the best possible way. Treatments for sleep disorders in the elderly include the appropriate use of pharmacological and nonpharmacological methods. As a nonpharmacological method, music therapy is an easily applicable, practicable, and low-cost initiative that can be undertaken within nursing practice. This study aimed to determine the quality of life of nursing home residents and the effect of passive music therapy administered before bedtime on sleep quality. The study tested the hypothesis that passive music therapy increases the sleep quality of elderly nursing home residents.

Materials and Method

This one-group, pretest–posttest quasi-experimental study was conducted in a private nursing home located in İstanbul on the Anatolian side of the city between September and October 2010. The universe of this study included 34 elderly residents of this institution during the study period. The participants did not have severe hearing impairment (deafness) or memory problems, were capable of answering the questions unassisted, and had no dosage changes in their current medications during the study. This study did not restrict its sample but attempted to enroll all the elderly residents; however, two participants did not agree to be interviewed while the pretest was administered, and one left the institution during posttest period, so the final study sample constituted 31 elderly subjects. As data collection tools, this study used a questionnaire developed by the researcher that had been used successfully in similar studies and included individual characteristics, sleep characteristics, and subjects' opinions about music; the Pittsburgh Sleep Quality Index (PSQI), which was developed by Buysse et al. (1989) to obtain data about sleep conditions; and a music CD. Researchers collected the data by carrying out face-to-face interviews with the subjects.

The Questionnaire

The 16-item questionnaire consisting of introductory information assessing the subjects' individual characteristics, sleep characteristics, sleep habits, and opinions about music. Researchers developed this questionnaire by analyzing similar studies that have assessed sleep quality in nursing home residents and reviewing the relevant literature.[20–23]

The Pittsburgh Sleep Quality Index (PSQI)

This scale was developed by Buysse et al. in 1989, and Agargun, Kara, and Anlar (1996) performed validity and reliability analyses of it in Turkey.[24,25] The PSQI was found to be a reliable, valid and standard measurement assessing sleep quality during the previous month. This scale consists of a total of 24 questions, of which 19 are self-rated and five are rated by a spouse or roommate. These last five questions are asked only for clinical information and are excluded from scoring. The 19th self-rated question asks whether a person has a spouse or roommate and should be ignored while determining the entire and component scores. The self-rated questions are then analyzed according to seven subdimensions: sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disorder, use of sleep medications, and daytime dysfunction. Some components include one item, while others consist of groups of a few items. Each item has a range of 0–3 points, and the total score of seven subdimensions constitutes the total PSQI score. A total PSQI score ranges from 0 to 21. A person whose total PSQI score is five or below is considered to have "good" sleep quality. The internal consistency coefficient of this scale is reported to be 0.80.[25]

The Music CD

Before choosing music to play to the elderly people, researchers met with the Traditional Turkish Music Research and Promotion Society. Based on direction from and literature knowledge of the society, the "Ussak" Maqam was played for the participants.

Study Process

During the study process, informed consent, autonomy, confidentiality and protection of confidentiality, do no harm, and beneficence principles were taken into account. Before initiating this study, ethical committee consent (28.09.2010-08) and institutional consent (23.08.2010) were obtained from the institution where the study was conducted. Written permission from the elderly subjects who were enrolled in the study sample were also received after explaining to them the aim of this study. At the beginning of the study, the interview form and the PSQI were administered using a face-to-face interview method. Each interview lasted approximately 20 minutes. Between October 4 and 25, 2010, the participants

listened to the Ussak Maqam music every night before bedtime between the hours of 20:00 and 21:00 in a salon together with the other elderly residents. After three weeks, the same questionnaires were administered to the participants and the effect of passive music therapy was assessed.

Limitations of the Study

The number of elderly people in the nursing home was not large enough to create a control group, and external variables affecting sleep quality cannot be controlled using residents of other nursing homes. Owing to these reasons, this study was conducted without creating a control group, which can be considered a limitation.

Data Analysis

Data analysis was performed using numbers, percentage calculations, and means. For normally distributed numeric data, the study used the paired t-test, while the Mann–Whitney U-test and the Kruskal–Wallis test were used for non–normally distributed numeric data. A significance level for statistical test results was determined to be $p<0.05$.

Results

This study found that among the elderly subjects com-

Table 1. Baseline characteristics of elderly nursing home residents (n=31)

Characteristic	n	%
Age (range: 64–91)		
≤80 years	13	41.9
≥81 years	18	58.1
Sex		
Female	20	64.5
Male	11	35.5
Marital status		
Married	6	19.4
Single	10	32.2
Widowed	15	48.4
Income level		
Median	31	100
Educational background		
Primary school	13	41.9
High school	11	35.5
University	7	22.6
Public insurance		
Yes	28	90.3
No	3	9.7
Chronic disease		
Yes	29	93.5
No	2	6.5
Medication use		
Yes	30	96.8
No	1	3.2
Smoking		
I smoke	6	19.4
I do not smoke	25	80.6
Alcohol use		
I do not use	29	93.5
I gave up using	2	6.5

Table 2. Distribution of sleep characteristics in elderly nursing home residents (n=31)

	n	%
Bedtime		
Before 22:00	11	35.5
Between 22:00 and 23:00	14	45.2
Between 23:00 and 24:00	6	19.3
Sleep latency		
<30 minutes	21	67.8
≥30 minutes	10	32.2
Morning wake time		
Before 06:00	2	6.4
Between 06:00 and 07:00	20	64.6
07:00 or later	9	29.0
Night Awakenings		
Never	10	32.3
<1 time per week	10	32.3
≥1 per week	10	32.3
≥3 times per week	1	3.1

Table 3. Distribution of bedtime habits and opinions about music in elderly nursing home residents (n=31)

	n	%
Bedtime habit		
Yes	12	38.7
No	19	61.3
Habits*		
Watch TV	8	25.8
Chat	5	16.1
Listen to music	2	6.4
Read a book	1	3.2
Walk around	1	3.2
Enjoying of listening to music		
Yes	27	87.1
No	4	12.9
Listening to music before bedtime		
Yes	26	83.9
No	5	16.1
Favorite music genre		
Turkish classical music	20	64.5
Turkish folk music	6	19.4
Classical music	3	9.7
Pop music	2	6.5

*More than one answer given.

posing the study group, 58.1% were aged 81 years or more, 64.5% were female, 48.4% were widowed, 41.9% were primary school graduates, and 90.3% had public insurance. Of the elderly subjects, 93.5% had a chronic disease, and 96.8% were taking a medication for their diseases. A great majority of the elderly subjects did not use cigarettes (80.6%) or alcohol (100%) (Table 1).

An analysis of the distribution of the subjects' sleep characteristics found that 45.2% slept between 22:00 and 23:00, 32.2% had difficulty falling sleep (sleep latency ≥30 minutes), 64.6% woke up between 06:00 and 07:00 in the morning,

Table 4. A comparison of mean BPMT and APMT PSQI scores in elderly nursing home residents

PSQI	BPMT	APMT	t	p
	Mean±SD	Mean±SD		
Subjective sleep quality	1.32±0.47	1.19±0.65	0.891	0.38
Sleep latency	0.96±0.65	0.64±0.66	2.402	0.02*
Sleep duration	0.22±0.71	0.19±0.40	0.273	0.78
Habitual sleep efficiency	0.32±0.17	0.00±0.00	1.000	0.32
Sleep disorder	1.22±0.66	1.12±0.34	1.139	0.26
Use of sleeping medication	0.41±0.62	0.41±0.62	—	—
Daytime dysfunction	1.00±0.73	0.83±0.86	0.724	0.47
Total sleep quality	5.19±1.75	4.41±1.60	2.237	0.03*

APMT: After passive music therapy; BPMT: Before passive music therapy; PSQI: Pittsburg Sleep Quality Index; SD: Standard deviation.

and 32.3% did not wake up until morning after falling sleep (Table 2).

The study found that 38.7% of the subjects had habits they carried out before bedtime. Of these habits, 25.8% was watching TV, 16.1% was chatting, 6.4% was listening to music, 3.2% was reading a book, and 3.2% was walking around. It was determined that 87.1% of the study subjects enjoyed listening to music, 83.9% wanted to listen to music before bedtime, and 64.5% liked listening to Turkish classical music (Table 3).

The mean scores of the elderly subjects before passive music therapy (BPMT) and after passive music therapy (APMT) were compared and found to be 5.19±1.75 and 4.41±1.60, respectively. The change in BPMT and APMT PSQI mean scores was statistically significant (p=0.03) (Table 4).

Among the elderly study participants, before passive music therapy 48.4% had good sleep quality (total PSQI score ≤5), and 51.6% had poor sleep quality (total PSQI score >5). After passive music therapy, 64.5% had good sleep quality, and 35.5% had poor sleep quality (Figure 1).

An analysis of BPMT and APMT PSQI subcomponents showed that the subjective sleep quality subdimension
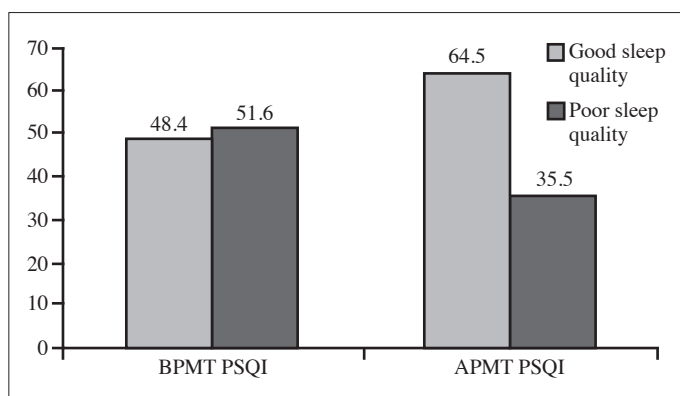
received the highest score, while the sleep disorder subdimension received the second highest score. A comparison of BPMT and APMT sleep-quality-scale subcomponents was found to be statistically insignificant (p>0.05) in terms of subjective sleep quality, sleep duration, habitual sleep efficiency, sleep disorder, and daytime dysfunction, but it was found to be statistically significant in terms of sleep latency (p=0.02). No intervention in the use of sleep medications was performed on the participants during passive music therapy, so a statistical calculation was not made based on this variable (Table 4).

Discussion

Both quality and quantity of sleep change along with increasing age. This study, whose participants' mean age was 81.0±8.49 years, found that 45.2% of the subjects slept between 22:00 and 23:00, 32.2% had difficulty falling sleep (were unable to sleep until 30 minutes had passed), 64.6% woke up between 06:00 and 07:00 in the morning, and 32.3% did not wake up until morning after falling sleep. Using the same variables, Fadıloğlu et al. (2006) conducted a study in a rest/nursing home and determined that 63% of the elderly patients slept between 22:00 and 23:00, 23% had difficulty falling sleep, 38% woke up between 06:00 and 07:00 in the morning, and 47% frequently woke up after falling sleep.[22] Babacan Gümüş et al. (2009) carried out a study in a nursing home and reported that 47.8% of the participants had difficulties falling sleep, and 58.3% of them woke up after falling sleep.[23] Şenol et al. (2013) determined that of elderly nursing home residents, 30% went to sleep at about 22:00, while 23.5% had difficulty falling sleep.[20] The findings of these relevant studies are in line with those of the present study.

This study determined that 38.7% of the elderly people had habits that enabled them to fall asleep more easily when they had difficulties falling sleep, and that of these habits, 25.8% was watching TV, 16.1% was chatting, 6.4% was listening to music, 3.2% was reading a book, and 3.2% was walking around. Gooneratne et al. (2011) carried out a study in a group of people aged 65 or older and reported that when

Fig. 1. Sleep quality before and after passive music therapy in elderly nursing home residents. APMT: After passive music therapy; BPMT: Before passive music therapy; PSQI: Pittsburg Sleep Quality Index.

people suffered from sleep problems, 66.4% of them watched TV or listened to the radio, and 56.2% of them read a book. [26] The present study found that participants mostly preferred to watch TV as a method for coping with sleep problems, whereas the elderly participants in the study by Gooneratne et al. (2011) preferred reading a book at a high level.[26] These results imply that book-reading habits in Turkish culture are relatively weak.

According to the BPMT PSQI scores, this study found that 48.4% of subjects scored 0–5 points (indicating good sleep quality), and 51.6% of subjects scored 6–21 points (indicating poor sleep quality) (Figure 1). BPMT, total mean PSQI scores were found to be 5.19±1.75 (Table 4). This study determined that BPMT, the total mean score of the elderly subjects' sleep quality scale was >5, meaning their sleep quality was poor. Ozturk (2003), Fadıloğlu et al. (2006), and Eser et al. (2007) found in their studies that 53.1% of people aged 75 and older, 77.0% of people living in nursing homes, and 60.9% of people living in nursing homes, respectively, experienced poor sleep quality.[21,22,27] These study findings share similarities with those of the present study.

According to the APMT PSQI scores, this study found that 64.5% of subjects scored 0–5 points (poor sleep quality), and 35.5% of subjects scored 6–21 points (good sleep quality) (Figure 1). APMT, total mean PSQI scores were found to be 4.41±1.60 (Table 4). This study determined that BPMT, the PSQI mean score of the elderly subjects was lower than their APMT PSQI mean score, and this change was found to be statistically significant (p=0.03) (Table 4). The fact that this study did not include a control group poses the question of whether the increase in sleep quality was caused by passive music therapy or different reasons. In the literature, factors that affect sleep quality have been defined as age, sex (male or female), exercise, lifestyle (daily and regular habits, listening to music, etc.), dietary habits, disease, medications, cigarette and alcohol consumption, environmental factors (bed size, bed comfort, noise, light, and air exchange in the room, etc.), and psychological factors (e.g., the fact that the elderly people's relatives do not come to visit at expected times, depression, fear, stress, etc.).[28–30] During the study period, when passive music therapy was administered (three weeks), observations made within the institution and interviews conducted with healthcare staff in the nursing home showed that there was no change in other factors affecting sleep quality, except for the change in lifestyle due to listening to music. Therefore, it can be concluded that the increase in sleep quality, which occurred by the end of this study, stemmed from passive music therapy. This result shows that music played to elderly people can have a beneficial effect on sleep quality.

Harmat et al. (2008) conducted a study about the effect of music on the sleep quality of young participants with poor sleep quality and determined that classical music statistically significantly increases sleep quality.[31] Ziv et al. (2008) carried out a study in elderly people suffering from sleeplessness and compared music relaxation and progressive muscle relaxation techniques. They found that the music relaxation method was more productive in terms of improving sleep quality. [32] A study of de Niet et al. (2009) about the effect of music-assisted relaxation on sleep quality found that this technique effectively increases the sleep quality of patients with various problems.[18] Chan et al. (2010) analyzed the effect of music on depression and sleep quality in elderly people and found an increase in sleep quality.[33] The present study findings parallel those of previous studies and also support the hypothesis of this study that passive music therapy increases the sleep quality of elderly nursing home residents.

Lai and Good (2005) conducted a study to determine the effect of music therapy on sleep quality in elderly people. They found significant improvements in a group who listened to music on sleep quality, sleep duration, sleep efficiency, and subcomponents of sleep quality.[17] However, in the present study, a comparison of BPMT and APMT sleep-quality-scale subcomponents was found to be statistically insignificant (p>0.05) in terms of subjective sleep quality, sleep duration, habitual sleep efficiency, sleep disorder, and daytime dysfunction, though it was found to be statistically significant in terms of sleep latency (p=0.02) (Table 4).

Results and Recommendations

The present study found that passive music therapy which is administered to elderly people can increase sleep quality. These study findings recommend that Maqam Ussak music should be played to elderly residents of nursing and rehabilitation centers at the evening hours.

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