Effect on Sleep Quality of Back Massage in Older Adults in Rest Home*

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Huzurevinde Yaşayan Yaşlılarda Sırt Masajının Uyku Kalitesine Etkisi

Giriş: Uyku bozuklukları yaşlılarda yaygın olarak görülür. Noninvasive bir yöntem olan sırt masajı son zamanlarda sağlığı geliştirmek ve konforu artırmak amacıyla yaygın olarak uygulanmaktadır. **Amaç:** Bu çalışma huzurevinde yaşayan uyku kalitesi kötü olan yaşlı bireylerde sırt masajının uyku kalitesine etkisini incelemek amacıyla planlanmış yarı deneysel bir çalışmadır. **Yöntem:** Araştırma İzmir, Türkiye'de bir huzurevinde yürütüldü. Araştırmanın örneklemini 33 yaşlı birey oluşturdu. Araştırmanın verileri, Yaşlı Tanıtım Formu, Pittsburgh Uyku Kalitesi İndeksi (PUKİ), Günlük Uyku Kayıt Formu, Pittsburgh Uyku Kalitesi İndeksi -3 günlük kullanılarak toplandı. Masaj, aynı araştırmacı tarafından üç gün boyunca, 10 dakika süreyle yaşlının yatağında uygulandı. **Bulgular:** Yaşlıların PUKİ toplam puan ortalamaları, masaj uygulanmadan önceki günlere (11.87 ± 2.11) göre masaj uygulandığı günlerde (9.78 ± 2.17) daha düşüktü (t = 8.07, p = .000). Masajın yaşlıların uyku kalitesini arttırdığı bulundu. **Sonuç:** Bu çalışmanın bulguları, sırt masajının uyku kalitesini iyileştirmede pozitif bir etkiye sahip olduğunu göstermektedir. Sonuçlar, yaşlılarda uyku üzerinde sırt masajının kullanımı açısından bir veri sağlar.
Anahtar kelimeler: Uyku Kalitesi, Masaj, Yaşlı.

Abstract
Background: Sleep disturbances are very common in elderly people. Back massage a noninvasive technique has been used to promote health and increase comfort recently. **Objectives:** This is a quasi-experimental study carried out to investigate the effect of back massage on sleep quality in older people who had poor quality of sleep in a rest home. **Methods:** This research was carried out in a rest home in İzmir, Turkey. The sample of the study was composed of 33 older persons. Research data were collected by using Elderly Information Form, Pittsburgh Sleep Quality Index (PSQI), Sleep Log and Pittsburgh Sleep Quality Index for three days. The older people received 10 minutes of back massage in their beds prior to bedtime over three days by the same researcher. **Results:** The subjects' PSQI total mean scores were lower before massage (11.87 ± 2.11) than on the days when the massage (9.78 ± 2.17) was done (t = 8.07, p = .000). It was found that the massage increased the participants' quality of sleep. **Conclusion:** The findings of this study indicated that back massage has a positive effect on improvement of sleep quality. The findings provide evidence for the use of back massage for sleep in older people.
Key Words: Sleep Quality, Massage, Older people.

Frequently complain about sleep disturbances (Ancoli-Israel and Ayalon, 2006; Cuellar, Rogers, Hisghman and Volpe 2007). A recent comprehensive review by Ohayon (2002) reported that in non-institutionalized elderly respondents, difficulties initiating sleep were reported in 15% to 45%, disrupted sleep in approximately 20% to 65%, early morning awakenings in 15% to 54%, and non-restorative sleep in approximately 10%.

Sleep patterns can be exacerbated when older people are admitted to a care institution (Ersser et al., 1999). More than half of all older adults report problems with sleep; up to two thirds of older adults living in nursing homes are also affected (Hoffman, 2003). In a study conducted in rest homes in Turkey by Eşer, Khorshid and Çınar (2007), the majority of the elderly residents (60.9%) were found to have poor quality of sleep.

Sleep quality is not directly associated with sleep quantity. Sleep quality is associated with subjective estimates of the ease of sleep onset, sleep maintenance, total sleep time, and early awakening. In addition, restlessness during the night, movement during sleep, and anxiety, tension, or calmness when trying to sleep have also been reported to be associated with sleep quality. Good sleep quality is associated with a wide range of positive outcomes such as better health, less daytime sleepiness, greater wellbeing and better psychological functioning. Poor sleep quality is one of the defining features of chronic insomnia (Harvey, Stinson, Whitaker, Moskovitz and Virk 2008).

With aging, differences in sleep are recognized by decreases in duration, depth, and continuity of restful sleep.

Reported differences include increased nighttime awakenings, increased time spent in bed but not asleep, and diminished deeper sleep (stages 3 and 4). By age 60 or 70 years, many adults experience a decrease in the proportion of time spent in delta sleep (stages 3 and 4) and more time spent in the lighter stages of sleep (stages 1 and 2), resulting in increasing numbers of awakenings. Reductions in REM stage sleep and significant fragmentation start to occur after age 50. Sleep duration also decreases between midlife and old age by about 28 minutes per decade, with the greatest losses occurring in light NREM sleep (Cuellar et al., 2007).

An increased number of sleep complaints is often associated with comorbid illnesses such as cardiovascular disease, diabetes mellitus, obesity, dementia, depression, Parkinson's disease, arthritis, and pulmonary disorders, particularly in older adults. Difficulties falling asleep or remaining asleep may be associated with illness causing pain, breathing difficulties, or nocturia (Neubauer, 1999). Medications prescribed for the treatment of comorbid conditions may also exacerbate or cause difficulties sleeping at night as well as drowsiness during the day, initiating naps and resulting in further disruption of night sleep (Cuellar et al., 2007). It has been reported in the literature that elderly individuals who take a nap during the day have poor quality of sleep (Ersser et al., 1999). Psychological factors that can disturb sleep include anxiety, depression, psychiatric disease, stress and cognitive function distress. In addition, there are environmental factors, such as noise, light and lack of private space. Social factors disrupting sleep include a lack of stimuli and a sense of boredom because of limited structured activity in older adults (Sok, 2007).

Several studies in the literature report that women experienced more frequent sleep problems (Bowman, 1997; Bundlie, 1998; Eşer et al., 2007; Fraser and Ross, 1993; Rediehs, Reis and Creason, 1990). In the study by Rocha, Guerra and Lima-Costa (2002), the prevalence of insomnia was higher for women than for men in every age

group and increased with age. In the study by Ohayon and Smirne (2002), twice as many women as men were diagnosed as having insomnia. In a study conducted by Ito et al. (2000), women were found to have difficulty falling asleep. A meta-analytic review of polysomnographic data found that older women may sleep better than older men, although older women complain more about their sleep than do older men.

Sleep problems results in an increased risk of falls, accidents, daytime sleepiness, chronic fatigue, difficulty with concentration and memory, and overall decreased quality of life (Ancoli-Israel and Ayalon 2006; Göktaş and Özkan, 2006). Sleep complaints are associated with increasing mortality and morbidity (Cuellar et al., 2007).

The cost of insomnia, the number one sleep complaint of older adults, has been estimated at more than $100 million with $285 million spent on benzodiazepines alone (Martin, Aikens and Chervin 2004). Adults aged over 65 years old are 5 times more likely to receive a drug prescription for sleep problems compared with younger adults (Cuellar et al., 2007).

The promotion of sleep in older people would therefore seem to have particular implications for the role of nurses and care workers. Nurses have only a limited range of non-pharmacological interventions to enhance the sleep quality of those in their care. Massage is one of the most common complementary therapies in nursing practice. It is well documented that massage therapy has been used throughout the world for thousands of years, and that touching, stroking and gentle massage can be a soothing and enjoyable experience. Selye's stress theory explains the effectiveness of massage as an integrated physiological response originating in the hypothalamus that leads to a generalized increase or decrease in the arousal of the central nervous system. Massage, which produces relaxation by decreasing the tension in the muscles, is the opposite of the stress response. The promotion of relaxation and relief from anxiety may work by reducing muscle spasms and, in turn, aiding pain relief (Mok and Woo, 2004).

Studies show that massage can be used to help problems such as anxiety, stress, depression, pain and insomnia by reducing tension in the muscles. Richards, Gibson and Overton-McCoy (2000), in a review of 22 studies of the effects of massage on relaxation, comfort and sleep, stressed that the best-known effect of massage was to provide psychological relaxation and to reduce anxiety and pain. Holland and Pokorny (2001) reported that applying gentle back massage for 3 days to individuals aged between 52 and 88 produced feelings of reduced anxiety, calm, restfulness, physical relaxation and happiness. Fraser and Ross (1993) recorded that back massage provided relaxation and reduced anxiety in chronically ill old people in long term care institutions. According to a study by Smith, Stallings, Mariner and Burrall (1999) hospitalized patients stated that massage was physically, emotionally and mentally very relaxing, and that they slept much better without the use of pain-killers or sleeping medication on the days when they received massage. Richards (1998) determined that male cardiovascular disease patients in an intensive care unit who were given back massage slept one more hour and had higher quality sleep in comparison with patients who were not given massage. The result of this study accords with the literature.

Back massage has been found to improve the mood of older people in institutional settings (Corley, Ferriter, Zeh and Gifford 1995), but, whilst there is some evidence that massage can produce relaxation (Fraser and Ross, 1993; Dunn, Sleep and Collett, 1995; Tetley, 1996; Çınar, Eşer and Khorshid 2009), its efficacy in positively modifying poor sleep patterns is not yet established. Early identification of sleep problems and interventions to improve sleep quality are crucial, because sleep disturbances that persists for a long period of time could decrease general health and functional status thus affecting quality of life. Although there are adequate researches on sleep, few studies have focused on the effects of back massage on improving sleep quality in Turkey, and particularly on older adults. This research was decided to be done in this population because sleep problems are usually common in older adults living in rest homes. Given that back massage is low cost, easily mastered and performed and non-invasive, this treatment technique should be investigated using methodologically sound, well- controlled studies.

Aims and Objectives

This is a quasi-experimental carried out to investigate the effect of back massage on sleep quality in older people who had poor quality of sleep in a rest home and the relationship between the effectiveness of back massage and factors that affect the quality of sleep.

Research Hypotheses

- Is there an effect on sleep quality of back massage in older people who had poor quality of sleep in the rest home?
- Is there an effect in the number of nap of back massage in older people who had poor quality of sleep in the rest home?
- Is there a relationship between the effectiveness of back massage and age groups that affect the quality of sleep?
- Is there a relationship between the effectiveness of back massage and gender that affects the quality of sleep?

Methods

Type of Research

This is a quasi-experimental study carried out to investigate the effect of back massage on sleep quality in older people who had poor quality of sleep in a rest home and the relationship between the effectiveness of back massage and factors that affect the quality of sleep.

Research Setting

This research was carried out in a rest home for older persons in İzmir, the third largest province in Turkey. This rest home is the first biggest in Europe and the second biggest in the world. The elderly are provided with shelter, nutrition and health care services in this rest home. The physical conditions and social opportunities of the rest home are better than those of other rest homes, and the elderly residents there have higher economic and educational levels.

Research Sample

Subjects included were 60 years of age and older; they were Turkish-speaking, could communicate verbally, and were not residing in the long term care unit; they had poor sleep, had >5 points on the PSQI, and had no contra-indication to back massage; they agreed to participate in the study, and did not attribute sleep problems to environ-

mental factors, such as the mattress, temperature, light, noise, etc.

Subjects excluded were those who had a medical diagnosis of Parkinson's or Alzheimer's disease, major depressive disorder, asthma, seizures, or a primary sleep disorder; those who used hypnotics, sedatives, antidepressants, anticholinergics, antihistamines, tranquilizers, or melatonin for sleep; those who meditated or did relaxation in the evening within 30 minutes before bedtime, or those who consumed caffeine before bedtime.

A total of 51 older persons who were within the scope of the research and whose PSQI scores were above 5, and who had poor sleep, were accepted for this study. However, the final sample of the study was composed of 33 older persons, because two of them died, the spouse of one died, seven of them did not agree to participate, and eight of them were absent for such reasons as visiting family and hospitalization. The same individuals comprised of the experimental and control group.

Instruments

Research data were collected over three days in face-to-face interviews using the Elderly Information Form, Pittsburgh Sleep Quality Index (PSQI), Sleep Log, and Pittsburgh Sleep Quality Index for three days.

The Elderly Information Form contained 5 questions related to descriptive information on the subjects.

Pittsburgh Sleep Quality Index (PSQI)

The PSQI was developed in 1989 by Buysse, Reynolds, Monk, Berman and Kupfer (1989) and was found to have adequate internal consistency (Cronbach's alpha = .80), test-retest reliability and validity. The validity and reliability tests of the PSQI for this country were adapted by Ağargün, Kara and Anlar (1996) (Cronbach's alpha = .80).

The Pittsburgh Sleep Quality Index (PSQI) gives measurements of retrospective sleep quality and disturbances over a 1-month period for use in clinical practice and research. The PSQI discriminates between good and poor sleepers, and provides a brief, clinically useful assessment of multiple sleep disturbances. Individual self-report items assess a broad range of domains associated with sleep quality, including usual sleep-wake patterns, duration of sleep, sleep latency, the frequency and severity of specific sleep-related problems, and the perceived impact of poor sleep on daytime functioning. Specific problems contributing to poor sleep that are assessed include pain, urinary frequency, breathing difficulty, snoring, dreams, temperature, etc.

The instrument consists of 19 items. There are 5 additional questions rated by the bed partner/roommate that are not included in the total score, but may be useful for clinical purposes. The 19 items are grouped into 7 equally-weighted component scores: 1) Subjective Sleep Quality (1 item); 2) Sleep Latency (2 items); 3) Sleep Duration (1 item); 4) Habitual Sleep Efficiency (3 items); 5) Sleep Disturbances (9 items); 6) Use of Sleeping Medication (1 item); and 7) Daytime Dysfunction (2 items). Items 1–4 are free-entry responses concerning usual going to bed and getting up times, minutes of total sleep time, and sleep latency (minutes). Items 5–18 are 4-point Likert scale responses pertaining to problem frequency. The Global Score ranges from 0 to 21. All component scores range from 0 to 3. Higher Global Scores indicate poorer sleep quality. An empirically derived cutoff score of > 5

distinguishes poor sleepers from good sleepers (Smith and Wegener, 2003).

There are several researches used PSQI for one week (Beck, Schwartz, Towsley, Dudley and Barsevick 2004; Dogan, Ertekin and Dogan 2005). The sleep quality for three days of older persons was investigated for the accurate data related to sleep in this research. Permission and approve for use of PSQI for 3 days was obtained by e-mail from Professor Agargun. The PSQI for three days was used to investigate the effects of a ten-minute period of back massage over three days on older people in a rest home. For this purpose the likert responses of the PSQI were modified to 'never during the three days', 'one night', 'two nights', and 'three nights'. No other changes were made, and the grading scale remained the same. In this study, PSQI for three days was found to have adequate internal consistency (Cronbach's alpha = .84).

Sleep Log

A sleep log is widely used in clinical and research settings. Although reliability and validity of the daily log are rarely reported, researchers have compared the daily log with polysomnographic monitoring, and found that objective data and subjective data were highly agreeable (kappa = 0.87), and that sensitivity and specificity were also high (92.3% and 95.6%) in narcoleptic subjects and control subjects (Rogers, Caruso and Aldrich 1993). Researchers have concluded that the log can provide accurate information about sleep/wake patterns (Tsay and Chen, 2003)

It was used the sleep log instead of estimated data related to sleep over the three days of this study. This form records sleep quality which includes bedtime, the time the person tried to fall asleep, the time the person thinks they fell asleep, the number, time, and length of any nighttime awakenings, the time the person woke up, the time the person got out of bed, the time the person had wanted to wake up before trying to fall asleep, a question about how the person felt during the day, and the start and end times of any daytime naps (Rogers et al., 1993).

Back Massage

The massage was applied by one researcher only, who was trained in back massage. Massage that aims to relax older adults in a nursing home or hospital consists of light effleurage and tapotement for 10 minutes, and was developed by Ersser et al. (1999).

Procedure

We found that PSQI scores were above 5. in other words, all of the subjects were poor sleepers. The back massage and control group consist of the same individuals. Older people were informed about back massage and sleep log by the researcher. Older adults were followed during six days. They weren't used back massage in the first three days (days 1-3). They all received 10 minutes of back massage in their beds prior to bedtime by the same researcher in the next three days (days 4-6). Baby oil was used for lubrication. Sleep log was completed by the participants after waking up every day, and then PSQI for three days was recorded by the researcher with the participants from sleep log records for baseline (day 1-3) and during the treatment (days 4-6).

Dependent variables
PSQI global score mean.
Independent variables
Back massage, age, gender, the number of nap.

Data Analysis
Subjects' PSQI global, sleep quality mean scores and number of naps before and after massage were analyzed using paired samples t test. Wilcoxon signed-ranks test was used to compare relationship between independent variables before and after massage.
Ethical Approval

The research was conducted in consistence with ethical principles. Written permission to conduct the research was obtained from the rest home and from the School of Nursing Scientific Ethics Committee, and written informed consent was obtained from the older people to participate in the research.

Results

It was determined that 39.4% of the participants were in the 60-69 age group (X = 71.36+ 4.78, Range: 60 - 80), 66.7% were female, 84.8% were widowed, 15.2% were married, 39.4% had a college education and 21.2% were

educated to high school level. In addition, it was found that 84.8 % lived in single rooms and 15.2% lived in double rooms.

Table1. Subjects' PSQI Global Score Means before and after Massage

PSQI Global Score	n	X ± Ss	t	p
Before Massage	33	11.87 ± 2.11	8.07	.000
After Massage	33	9.78 ± 2.17		

Table 2. Sleep Quality Mean Scores of Subjects before and after Massage

PSQI Subcomponents (n = 33)	Before Massage X ± Ss	After Massage X ± Ss	t	p
Subjective Sleep Quality	2.60 ± 0.49	2.09 ± 0.67	5.83	.000
Sleep Latency	2.66 ± 0.59	1.90 ± 0.80	7.08	.000
Sleep Duration	2.03 ± 0.98	2.06 ± 0.96	-.23	.813
Habitual Sleep Efficiency	2.39 ± 0.78	1.81 ± 0.91	3.81	.000
Sleep Disturbances	1.03 ± 0.17	1.00 ± 0.00	1.00	.325
Daytime Dysfunction	1.15 ± 0.36	0.87 ± 0.41	3.46	.000

The subjects' PSQI total mean scores were lower before massage than on the days when the massage was done (t = 8.07, p = .000) (Table 1).

In the examination of the effect of massage on the subjects' PSQI components it was determined that their subjective sleep quality (p = .000), sleep latency (p =

.000), habitual sleep efficiency (p = .000), and daytime dysfunction (p = .000) mean scores were lower after massage (Table 2). Massage was not found to have an effect on sleep duration (p = .810) and sleep disturbances (p = .325) mean scores (Table 2).

Table 3. Number of Naps of Subjects before and after Massage

Number of Naps	n	X ± Ss	t	p
Before Massage	33	1.60 ± 0.70	4.78	.000
After Massage	33	1.09 ± 0.45		

Table 4. Subjects' PSQI Global Score Means for Age Groups and Gender before and after Massage

PSQI Global Score (n = 33)	Before Massage X ± Ss	After Massage X ± Ss	Z	p
Age Groups				
60-69(n = 13)	13.15 ± 1.14	10.69 ± 2.01	-3.198	.001
70-80 (n = 20)	11.00 ± 2.12	9.20 ± 2.11	-3.488	.000
Gender				
Female (n = 22)	12.40 ± 1.99	10.86 ± 1.48	-3.717	.000
Male (n = 11)	10.72 ± 1.84	7.63 ± 1.68	-2.953	.003

The number of naps taken by subjects was higher before massage than on the days when massage was performed (p = .000) (Table 3).

A significant difference was found in PSQI score means between before massage and the days when the

massage was done according to age groups (Z=-3.198, p=.001; Z=-3.488, p=.000). There were a statistically significant difference in PSQI score means between before massage and the days when the massage was done in female and male (Z=-3.717, p =.000; = -2.953, p=.003) (Table 4).

Discussion

It was found that the massage increased the participants' sleep quality (Table 1). Back massage applied for 10 minutes before bedtime is thought to increase the quality of sleep because it provides physical and psychological relaxation. Studies show that massage can be used to help problems such as anxiety, stress, depression, pain and insomnia by reducing tension in the muscles (Ferrell-Torry and Glick 1993; Richards, 1998; Richards et al., 2000). The result of this study accords with the literature.

In this research was found that back massage treatment was effective in improving sleep not only on the global PSQI score, but also on four of the five component sub-scales of the PSQI. In the examination of the effect of massage on the PSQI components it was determined that it decreased scores (i.e. had a positive effect) for subjective sleep quality, sleep latency, habitual sleep efficiency, and daytime dysfunction (Table 2).

Massage helped the elderly individuals in the study to physically and psychologically relax, which shortened the time it took them to fall asleep and increased their habitual sleep efficiency, so that they felt more rested. This may have caused them to perceive that they had better subjective sleep quality. It is suggested that those who felt better rested were able to carry out their daily activities more easily, thus decreasing their daytime dysfunction scores.

Massage did not change the duration of sleep (Table 2). The quality of sleep is more important that the duration in terms of providing rest (Ersser et al., 1999).

Massage was not found to have an effect on the subjects' sleep disturbance score (Table 2). Because back massage is not able to relieve symptoms of some of the physiological changes seen in the elderly (changes in the bladder sphincter, prostatic hypertrophy, etc.) it did not have an effect on sleep disturbances. Because elderly individuals using sleep medication were not included in the study, the relationship between use of sleep medication before and on the days when massage was given was not examined.

There was an effect in the number of nap of back massage in older people who had poor quality of sleep in the rest home. Massage was found to decrease the number of naps the elderly people took. Because massage increased the quality of sleep, the subjects felt more rested and may have had less need for naps. Similarly the positive change in the daytime dysfunction score is an indicator that they were better rested.

Various independent variables such as age and gender were examined that were thought to affect quality of sleep (PSQI global score mean) in older people used back massage. There was a relationship between the effectiveness of back massage and age groups that reduce PSQI global score mean. It was determined that age groups were similarly affected by back massage (Table 4). In this study, it was thought that there was a significant difference between age groups, because age groups were very close and all people were older. There are several studies reported in the literature in which women experienced more frequent sleep problems (Bowman, 1997; Bundlie, 1998; Eşer et al., 2007; Fraser and Ross, 1993; Rediehs et al., 1990). There was a relationship between the effectiveness of back massage and gender that reduces PSQI global score mean. Massage was found to affect positively the sleep quality of women and men (Table 4).

Conclusion and Recommendations

This study was to examine the effects of back massage on the quality of sleep of rest home residents. The results of the research showed that back massage applied for 10 minutes before bedtime in older adults increased the quality of sleep in older adults. Back massage resulted in significantly better sleep quality in the older people, as well as significantly better components of sleep quality: better perceived sleep quality, shorter sleep latency, greater sleep efficiency and less daytime dysfunction.

Back massage, as was evidenced in this study, seems to be an efficacious means to improving sleep quality in rest home residents. Because massage will decrease the consumption of sleep medication it may be beneficial in improving the quality of sleep, preventing polypharmacia, and in decreasing costs. It is suggested that nurses and older persons' relatives can use this simple, noninvasive healing method to manage sleep disturbances.

Based on the research findings it is recommended that a comparison be made of the effects on sleep quality of back massage in different durations and between back massage and other complementary therapies such as acupressure and music on elderly individuals with poor sleep quality.

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