DERLEME / *REVIEW*

The Effect of Back Massage on Sleep Quality: A Systematic Review

Sırt Masajının Uyku Kalitesi Üzerine Etkisi: Sistematik Bir İnceleme

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ABSTRACT

Aim: *The conditions such as pregnancy, old age, health problems and hospitalization negatively affect the sleep quality. Improving patients' sleep problems is a part of nursing care. Nurses try to reduce patients' sleep problems by using back massage, which is one of the non-drug methods. This systematic review was carried out to evaluate the effect of back massage application on the sleep quality of individuals.*

Material and Method: *The PRISMA protocol was followed in the conduct of the study. MEDLINE (EBSCOhost), SAGE, SCIENCE DIRECT, ULAKBIM (national academic network and information center), COCHRANE databases, and SEMANTIC SCHOLAR search engine were scanned through Atatürk University's internet access network. The literature review conducted using Turkish and English keywords, 1044 articles were reached, and 14 articles met the inclusion criteria. Prospective, randomized controlled, or experimental/quasi-experimental design research articles written in Turkish and English were included in the review.*

Results: *71.4% of the reviewed studies had randomized control groups. In 92.8% of the studies, it was determined that the massage duration varied between 3 and 30 minutes and that the back massage improved sleep quality.*

Conclusion: *In this systematic review, it was concluded that back massage application was an effective intervention in increasing the sleep quality of the patients and that this massage should be applied for at least 10 minutes late in the day and every session.*

Key words: *back massage; sleep; nursing; systematic review*

ÖZET

Amaç: *Hamilelik, yaşlılık, sağlık sorunları ve hastaneye yatış gibi durumlar uyku kalitesini olumsuz etkiler. Hastaların uyku problemlerini iyileştirmek hemşirelik bakımının bir parçasıdır. Hemşireler ilaç dışı yöntemlerden biri olan sırt masajı yaparak hastaların uyku problemlerini azaltmaya çalışırlar. Bu sistematik derleme, sırt masajı uygulamasının bireylerin uyku kalitesine etkisini değerlendirmek amacıyla yapılmıştır.*

Materyal ve Metot: *Çalışma PRISMA protokolü takip edilerek yürütülmüştür. Atatürk Üniversitesi internet erişim ağı üzerinden MEDLINE (EBSCOhost), SAGE, SCIENCE DIRECT, ULAKBİM (ulusal akademik ağ ve bilgi merkezi), COCHRANE veri tabanları ve SEMANTIC SCHOLAR arama motoru taranmıştır. Türkçe ve İngilizce anahtar kelimeler kullanılarak yapılan literatür taramasında 1044 makaleye ulaşılmış ve dahil edilme kriterlerine uyan 14 makale incelenmiştir. İncelemeye Türkçe ve İngilizce olarak yazılmış prospektif, randomize kontrollü veya deneysel/yarı deneysel tasarımlı araştırma makaleleri alınmıştır.*

Bulgular: *İncelenen araştırmaların %71,4'ü randomize kontrol grupludur. Çalışmaların %92,8'inde masaj süresinin 3 ile 30 dakika arasında değiştiği ve sırt masajının uyku kalitesini iyileştirdiği belirlenmiştir.*

Sonuç: *Bu kapsam incelemesinde sırt masajı uygulamasının hastaların uyku kalitesini artırmada etkili bir müdahale olduğu ve bu masajın günün geç saatlerinde ve her seansta en az 10 dakika uygulanması gerektiği sonucuna varılmıştır.*

Anahtar kelimeler: *sırt masajı; uyku; hemşirelik; sistematik inceleme*

Introduction

Sleep is one of the life activities with physiological, psychological, and social dimensions. Sleep, which is usually repeated every 24 hours and has an average daily duration of 6–8 hours in adults, is a cyclical process that relieves individuals by removing them from stress and responsibilities and provides energy storage again from spiritual and physical aspects. Individual factors such as age, diet, general health status, presence of pain, drugs used, pregnancy and birth processes, and environmental factors such as ambient temperature, noise, and features of the bed used may affect the sleep process[1–3]. Hospitalization is one of the conditions that

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negatively affect the sleep process. The studies indicated that hospitalized patients' sleep quality was impaired, and they had sleep problems[4–8].

Impairment in sleep quality is characterized by the symptoms such as spending too much time for transition to sleep, shortening sleep duration, unrest during the night, continuous movement during sleep, and waking up without feeling rested. Low sleep quality causes fatigue, deterioration in concentration, learning disability, nervousness, increased sensitivity to pain, hallucinations, slowing of growth, weakening of the immune system, susceptibility to infections, delay in wound healing, decrease in quality of life, and increased risk of mortality and morbidity [3,9]. Pharmacological agents are frequently used to overcome sleep problems. However, the pharmacological agents used may cause undesirable effects and economically require additional expenditure. Nurses are responsible for identifying the sleep process in hospitalized patients, determining the changes in sleep patterns due to disease, and establishing a healthy sleep pattern with appropriate interventions[3,8–10]. One of the non-pharmacological interventions proposed to improve sleep quality and facilitate sleep is applying the massage. Massage is a systematic touch to the body to reduce tension, provide relaxation, and stimulate and accelerate blood circulation[11,12]. Massage decreases fatigue, exhaustion, tension, and pain by showing a sedative effect and improves the feeling of trust in individuals. Studies indicated that massage relieves pain and fatigue, reduces blood pressure, decreases heart rate, decreases cortisol release and depression, and regulates sleep[11,13–27]. Therefore, massage is a method that is frequently used to overcome sleep problems. Massage application is also a subject of nursing research since it is included in the Nursing Interventions Classification System with code 1480[28].

This review provided an overview of the studies conducted to investigate the effect of back massage on sleep quality.

The research questions in the study are as follows:

Question 1: What is the distribution of studies according to the patient group in the sample?

Question 2: What is the distribution of the back massage applied in studies according to its duration?

Question 3: What is the distribution of disciplines applying back massage in studies?

Question 4: What is the distribution of the effectiveness of back massage in studies?

Methods

Protocol

The review follows the systematic methodology outlined by Liberati et al. 29. Consistent with this methodology; the review was conducted in 5 steps. Step 1 involved developing the research questions; Step 2 identifying relevant studies; Step 3 selecting studies; Step 4 charting data; and Step 5 collating, summarizing, and reporting results. The PRISMA checklist for systematic reviews was used in the reporting29.

Search Strategy

At first, a literature review was conducted to determine the keywords. It was decided that the Turkish keywords would be "sirt masaji, uyku, hemşirelik, randomize," and English keywords would be "back massage, sleep, nursing, randomized". MEDLINE (EBSCOhost), SAGE, SCIENCE DIRECT, ULAKBIM (national academic network and information center), COCHRANE databases, and SEMANTIC SCHOLAR search engine were scanned between 26–30 November 2018 through Atatürk University's internet access network, by using those keywords. No restriction was made on the publication date of the studies.

Inclusion Criteria

The research articles with prospective, randomized controlled or experimental/quasi-experimental design written in Turkish and English, evaluating the effect of back massage application with a sleep quality scale or patient statements, and published as full text were included in the review.

Exclusion Criteria

Descriptive or retrospective studies, research designs in the form of thesis, book, book chapter, review, letter to the editor, case and reports, and the studies including the massage applications performed in babies were not included in the review.

Study Selection

The literature review was first carried out in five databases, a search engine in the first step, and all full-text articles obtained were combined (n=1044). A data coding form was created, and all articles were coded and transferred to this form. All authors independently reviewed the titles and abstracts of the articles. Repeated articles were determined and deleted (n=82). Among the articles obtained (n=962), the articles that did not have the inclusion criteria (n=602) and were not related to the subject (n=342)

were excluded. Among the remaining articles (n=18), the articles that were not in English or Turkish (n=3) and the article including the massage application in babies (n=1) were determined and excluded. As a result, 14 articles were included in the review [11,13,16–27].

The researchers independently evaluated the research regarding purpose, method, sample characteristics, and applied intervention. They scored the appropriate item as one and the unsuitable item as 0. For the research that scored 4 points from one of the researchers and below four from the other, the third researcher's score determined the decision. The flow chart is presented in Figure 1.

Analysis of the Results

Data were grouped according to the determined research questions and evaluated in frequency and percentage.

Results

This systematic review included the results of the articles investigating the effect of back massage on sleep quality.

Years and countries: While the first evidence in the relevant full texts on the subject reached includes the results of the studies conducted in 1992, the most recent evidence published belongs to the results of the studies conducted in 2017 (1992-1, 1998-1, 2009-1, 2010-3, 2012-1, 2014-2, 2015-1, 2016-2, 2017-2). The studies included in the review appeared mainly conducted in the USA and India (USA 4, India 4, Türkiye 3, Brazil 1, Taiwan 1, Iran 1).

***Research type*:** 10 of 14 studies (71.4%) were randomized controlled trials. Four studies had a non-randomized/quasi-experimental design and no control group.

***Individuals included in the sample*:** It was determined that adult patients diagnosed with cardiovascular disease (n=5), cancer patients (n=2), children and adolescents with psychiatric disorders (n=1), postpartum women (n=1), patients with dementia (n=1), caregivers of cancer patients (n=1), patients undergoing hemodialysis (n=1), intensive care patients (n=1) and elderly people living in nursing homes (n=1) were included in the studies. The individuals included in the studies were between 7 and 80 years.

***Sample size*:** While the sample size of the studies ranged from 30 and 74 people, the control group size of the great majority of them was 30 or below 30.

***Those who applied back massage and the duration of back massage*:** Back massage was applied by the students from the psychology department (n=1), massage therapist (n=2), physiotherapist (n=1), and nurse (71.4%, n=10) within a maximum of 4 weeks with light/medium pressure for a maximum of 30 minutes, including at least 3

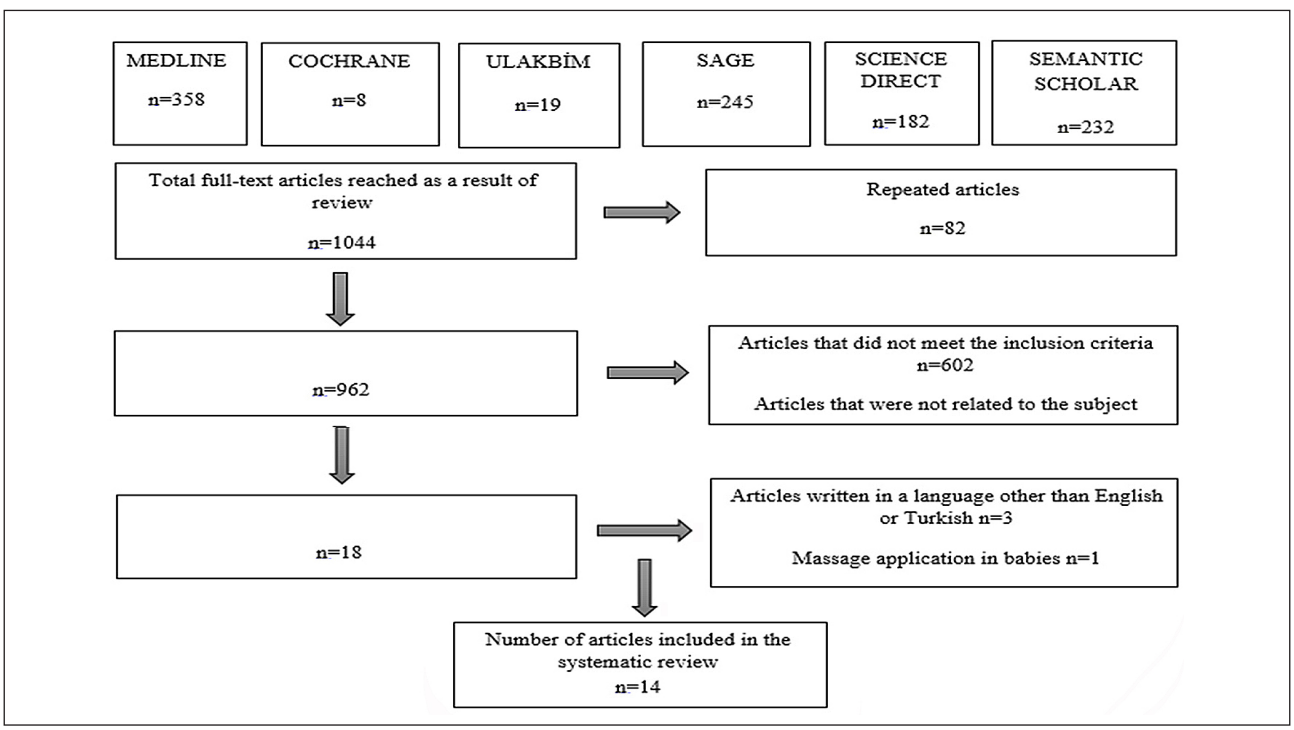

Figure 1. *Flow chart.*

minutes for a session, with the combinations of effleurage, petrisage, friction, and tapotement maneuver.

***The effect of back massage on sleep*:** All studies included in the review (92.8%), except for one, determined that back massage shortened the duration of falling asleep, increased sleep duration, and improved sleep quality by reducing sleep disorders.

The features of the articles are presented in Table 1.

Discussion

This study aims to evaluate the effect of back massage on sleep quality; 14 articles meeting the inclusion criteria were reached[11,13,16–27]. The fact that most of the studies were carried out in the countries in Asia and generally in the last decade suggests that the interest in non-pharmacological methods has increased in these regions in recent years. The fact that 10 of these studies (71.4%)[11,13,17–19,22,24–27] had a randomized controlled research design suggests that the results obtained had high evidence. The other four studies[16,20,21,23] had a lower level of evidence with a non-randomized pretest-posttest quasi-experimental research design. The fact that the individuals discussed in the articles included in this systematic review are in a wide age range and vary greatly in terms of disease indicates that many diseases may affect the sleep quality of individuals in all age groups. In most of the studies examined in this review, the sample size is limited to the parametric test. It is considered that large sample studies are needed for more reliable results. In the studies included in the review, while the time of back massage application was not indicated in some studies, it was observed that they were usually applied during the evening hours and at night before going to bed[11,16,17,19–21,25,26]. The results show that the back massage applied late in the day effectively improves sleep quality. This result is also consistent with the circadian rhythm. It is thought that there is a need for studies evaluating the effect of massage applied earlier. The application time of back massage appeared to vary in the studies. While the massage session duration was not indicated in one of the studies[19], the total duration of massage was not shown due to continued application from patients' admission to discharge in study[21]. In other studies included in the review, the back massage was applied in a session for 3–30 minutes, and that light and medium pressure were applied during the massage. In the study of Harris et al., in which light pressure was applied, and the session duration was the shortest by 3 minutes[11], it was found that back massage did not improve sleep quality. In other studies, it appeared that back massage is effective in improving sleep quality regardless of the duration of application. Nevertheless, when the studies were analyzed in terms of statistical significance values, it appeared that the massage session duration was at least 10 minutes in the studies indicating the values p£0.001 and z >1.96. These results suggest that it will be more appropriate to plan the session duration of back massage for at least 10 minutes. In the studies included in the review, it appeared that back massage was mostly applied (71.4%) by nurses[11,13,16–18,20–22,26,27], however, it is seen that massage therapists[23,25] physiotherapist[19] and psychology students[24] applied back massage in a fewer number of studies. To assist the individuals in all life activities, they need a holistic approach, which is one of the nurses' responsibilities. The fact that nurses are further focused on the studies on sleep problems than other health professions can be explained by this approach and the responsibilities of nurses. Furthermore, massage applications are among the nursing interventions and are considered a part of nursing care. In 13 (92.8%) of the studies included in the review, it was determined that there was a statistically significant difference between back massage and sleep and that back massage was effective in improving sleep quality; however, only in study[11], it was determined that there was no statistically significant relationship between back massage and sleep. It can be considered that the relevant therapeutic effect of back massage decreases cortisol, norepinephrine, and epinephrine levels by stimulating the sympathetic nervous system and thus improves the sleep quality of patients due to the physical and psychological relief it provides.

Ensuring high-quality individual/patient-centered and evidence-based care requires the implementation of appropriate, acceptable, safe, and effective nursing interventions[28]. Back massage, as a part of basic nursing care, may be useful in preventing polypharmacy since it decreases the consumption of sleeping pills, increases patient comfort, reduces costs, and improves sleep quality. So, nurses can provide an effective, economical, invasive, and non-pharmacological, complementary contribution to increasing the sleep quality of patients with sleep problems. They can also increase patient satisfaction by improving the quality of nursing care.

Conclusion

In this systematic review, it was determined that the health professional who mostly applied the back massage to improve patients' sleep quality was the nurse and that the back massage application positively affected the sleep quality of patients. Although there was no common view for the duration of back massage, it was

Table 1. *Features of the articles included in the review*

Authors, country of research	Research type	Sample	Groups	Intervention	Conclusion
1. Field et al. 1992; USA	Randomized controlled	Children and adolescents with psychiatric disorders aged between 7–18 years	n=20 control group n=52 experimental group	Medium-pressure back massage was applied by psychology students for 30 minutes per day every afternoon for 5 days. Night sleep was recorded as video.	The sleep duration of the group received back massage for a five-day period significantly increased and the time spent awake in bed decreased (p=0.01).
2. Richards, 1998; USA	Randomized controlled	Elderly male patients with a diagnosis of cardiovascular disease hospitalized in the intensive care unit of the hospital	n=24 control group n=17 experimental group	6 minutes of back massage was applied by the nurse.	The patients who received back massage slept more (more than 1 hour) than the control group, and the difference was found significant.
3. Pruthi et al., 2009; USA	Quasi-experimental	Patients diagnosed with breast cancer	n=35 (no control group)	Back massage was applied by massage therapist for 20 minutes using mineral oil.	Massage therapy was found to be effective in improving sleep quality (p<0.05).
4. Nerbass et al., 2010; Brazil	Randomized controlled	Patients aged between 40–80 years undergoing coronary artery bypass graft surgery	n=20 control group n=20 experimental group	Back massage was applied by the physiotherapist 2–3 hours before sleep (at 19.00) for 3 nights.	Massage therapy was found to be effective in improving sleep quality during recovery period after the CABG surgery (p=0.019).
5. Ko and Lee, 2010; Taiwan	Randomized controlled	Postpartum women aged 20 and over	n=30 control group n=30 experimental group	Back massage was applied by a certified massage therapist for 20 minutes using body lotion, once a day between the evening hours of 17.00–21.00 during 5 consecutive days.	It was observed that back massage application significantly improved the sleep disorder in postpartum women with sleep disorders (p<0.001).
6. Harris and Richards 2010; USA	Randomized controlled	Patients with dementia aged 65 years and older with sleep disorders	n=20 control group n=20 experimental group	3-minute low-pressure, slow, circular stroke back massage was applied by a certified geriatric nurse before going to bed for 2 nights.	No significant difference was observed in sleep improvement between the intervention group and control groups (p>0.05).
7. Cinar and Eser, 2012; Türkiye	Quasi-experimental	Elderly people living in nursing home	n=33 (no control group)	The group was given a 10-minute back massage daily with non-aromatic baby oil before going to bed for the first 3 days by a nurse researcher.	Massage was found to be effective in improving sleep quality (p=0.000).
8. Shinde and Anjum, 2014; India	Pretest-posttest randomized controlled	Intensive care patients (aged between 25–70 years)	n=30 control group n=30 experimental group	10–12-minute low pressure back massage was applied by the nurse researcher in the evening hours between 20.00–21.00 for three consecutive days.	Back massage was found to be significantly effective in improving sleep quality (p<0.05).
9. Mathpati and Dias, 2014; India	Pretest-posttest non-randomized control group	Patients with congestive heart failure (male patients aged between 35–65 years)	n=50 (no control group)	10 minutes of back massage was applied by the nurse using effleurage, petrisage, friction and tapotement maneuvers before going to bed for three consecutive days.	It was found that back massage significantly improved the sleep disorder in patients with congestive heart failure (z=3.76, >1.96).
10. Pinar and Afsar, 2015; Türkiye	Randomized controlled trial	Caregivers of cancer patients were studied	n=22 control group n=22 experimental group	15 minutes of medium pressure back massage was applied by the nurse researcher using effleurage, petrisage, friction and tapotement maneuvers with non-aromatic baby oil between the evening hours 17.00 and 20.00 for one week.	Back massage application was found to be significantly effective in improving sleep quality (p<0.001).
11. Unal and Akpinar, 2016; Türkiye	Randomized controlled	Patients aged between 18 and 60 years undergoing hemodialysis twice a week in the dialysis center	n=37 control group n=37 experimental group	30 minutes of back massage was applied by the nurse researcher using effleurage, petrisage, friction and tapotement maneuvers with baby oil for 2 days a week within 4 weeks.	Back massage was found effective in improving sleep quality (p<0.05).
12. Joys and Kumari, 2016; India	Pretest-posttest randomized controlled	Cardiothoracic intensive care unit	n=20 control group n=20 experimental group	20 minutes of back massage was applied by the nurse between postoperative days 2 and 5.	Back massage was found to be effective in improving sleep quality among postoperative patients after cardiac surgery (p<0.05).
13. Miladinia et al., 2017; Iran	Randomized controlled	Patients with acute leukemia receiving chemotherapy (aged between 18–50 years)	n=30 control group n=30 experimental group	After chemotherapy, 10 minutes of low pressure back massage with vaseline was applied to the patients by oncology nurse 3 times a week within 4 weeks.	It was determined that back massage significantly improved sleep quality in patients receiving chemotherapy for acute leukemia compared to the control group (p=0.003).
14. Sable et al., 2017; India	Pretest-posttest quasi-experimental	Adult patients with congestive heart failure	n=30 (no control group)	20 minutes of back massage was applied to the patients by the nurse researcher using effleurage, petrisage, friction and tapotement maneuvers 3 times in a day at 08.00 in the morning, 15.00 and 20.00 in the evening, every day from the first day of their admission to discharge.	Back massage has a significant effect in improving sleep duration and sleep quality (p£ 0.0001).

Articles are listed by the year of publication.

concluded that the massage should be applied late in the day and every session for at least 10 minutes. In line with these results, for the back massage procedure, it is recommended to conduct more studies with a larger number of samples and systematic review and meta-analysis for precise information.

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Conflict of Interest

No conflict of interest between authors

Ethical Approval

All necessary ethical permissions have been obtained

Authors' Contributions

RBA contributed to the study design; GA and EA searched the literature and performed data selection and extraction; RBA, GA, and EA analyzed the data and interpretation of results; RBA contributed to the critical debate; RBA, GA, and EA have read and approved the latest article.

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