

Systematic Review

Non-Pharmacologic Approaches to Sleep Problems for Palliative Care Cancer Patients:
A Systematic ReviewDilek Baykal¹, Necmiye Çömlekçi²¹Department of Nursing, Faculty of Health Sciences, Istanbul Atlas University, Istanbul, Turkey²Department of Nursing, Faculty of Health Sciences, Bartın University, Bartın, Turkey

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Abstract

OBJECTIVE: This present systematic review aims to examine the effectiveness of non-pharmacological approaches to sleep problems for cancer patients in palliative care.

METHOD: In this review, the data of the last 5 years from 2018 to 2023 are included in Scopus, Web of Science, CINAHL, PubMed, Medline, Ulakbim National Database and Cochrane Library databases were scanned using the keywords "palliative care, sleep disorder, non-pharmacologic, insomnia, cancer, randomized controlled trial" in English and Turkish. As a result of the search, we identified 90 articles. This review was based on Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols 2015 Statement recommendations.

RESULTS: This current review comprised 5 randomized controlled trials. The included studies were found to examine methods such as aromatherapy, massage, therapeutic touch, and white light, leaving out other methods (sleep hygiene, exercise, etc.), which are effective in treating insomnia. We established that the methods discussed in these studies were highly effective in improving sleep quality.

CONCLUSION: Non-pharmacological methods for treating sleep problems in cancer patients in palliative care have been shown to be effective. We consider it important that nurses were involved in these studies. On the other hand, we would recommend that studies be conducted to evaluate the effect of other nonpharmacologic methods on sleep problems.

Keywords: Palliative care, sleep problems, systematic review

Introduction

The World Health Organization defines palliative care as "approaches that aim to improve quality of life by meeting the physical, psychosocial, and spiritual care needs of patients and their families who are facing problems due to life-threatening reasons and that include practices to prevent and relieve suffering" (World Health Organization, 2018).

Although palliative care is often understood as end-of-life care, it is actually intrinsically integrated with medical care, regardless of the stage of the illness. Palliative care aims to relieve symptoms and improve the quality of life of people with serious illnesses (Karasu, 2020; Steinhauser et al., 2017). Patients in palliative care may suffer from many symptoms such as nausea, vomiting, dyspnea, and constipation, including insomnia (Verkissen et al., 2019).

Sleep problems are one of the most important health problems affecting the quality of life of palliative care patients. Although sleep problems occur in different ways, they affect 30%-60% of cancer patients (Davis & Goforth, 2014; Irwin, 2013). Sleep problems may appear in the form of difficulty falling asleep, difficulty

maintaining sleep, waking up early, and difficulty maintaining daytime functions (American Psychiatric Association, 2014).

Although the underlying cause of cancer-related insomnia (CRI) is not well understood, it may develop due to the disease itself or the side effects of treatment. In addition, CRI can occur alone or be accompanied by pain, fatigue, flushing, nausea, vomiting, anxiety, and depression (Armstrong et al., 2017; Ruel et al., 2015). Occasionally, the presence of CRI can lead to anxiety, depression, fatigue, and cognitive impairment (Kreissl et al., 2020; Nishiura et al., 2015). Insomnia is a complex symptom that affects patients' quality of life (Li et al., 2016) and should therefore be treated.

A thorough medical assessment is important in the treatment of insomnia. Although there are evidence-based clinical practice guidelines for the assessment of CRI and it is a very common predicament, there are occasions when routine screening and assessment fall short. This is because other health problems take priority or the patient prefers to remain silent. Diagnosis of CRI is the gold standard for treating the ailment. Studies reviewed within the context of the meta-analysis make use of the Pittsburgh Sleep Quality Index, Epworth Sleepiness Scale, General Sleep Disorder

Scale, and Athens Insomnia Scale in assessing sleep problems. The National Comprehensive Cancer Network (NCCN) guidelines also recommend detailed patient assessment (Denlinger et al., 2020). In addition, the assessment of insomnia should also consider (a) the person's beliefs about sleep; (b) the impact of insomnia on the person's quality of life, functions of daily living, ability to drive, ability to work, and conduct in interpersonal relationships; (c) underlying causes of insomnia and related comorbidities; (d) sleep history; (e) the duration of existing symptoms; and (f) sleep diary (Krystal et al., 2019).

Once insomnia is diagnosed in cancer patients using valid and reliable scales, the next step would be to discuss ways of treating it. Pharmacological and non-pharmacological methods are used in the treatment of insomnia. Pharmacological treatments contribute to the improvement of general health and quality of life. However, before opting for pharmacological treatment, the underlying causes (psychiatric disorders, physiological causes, sleep-related causes) should be investigated. Similarly, it is necessary to treat sleep-disrupting habits and drug use, if any. For example, if the patient is taking a drug that disturbs sleep, a change of dose, if possible, or changing the timing of intake may help regulate sleep. In addition, the interaction of pharmacological treatment with other drugs taken by the patient and the type of cancer (may exacerbate symptoms in cancers involving the central nervous system) should not be overlooked (Griffin et al., 2013). Regardless of the underlying cause, the goal of pharmacological treatment is primarily to improve sleep quality, sleep duration, and daily routines associated with insomnia (Rosenberg et al., 2021). The pharmacological treatment uses benzodiazepines, antihistamines, melatonin receptor agonists, selective histamine H1 antagonists, orexin antagonists, antidepressants, antipsychotics, anticonvulsants, and nonselective antihistamines (Krystal et al., 2019).

Nurses caring for cancer patients in palliative care have duties in diagnosing and treating sleep problems and other symptoms. The nonpharmacologic interventions that nurses can use can be grouped as sleep hygiene, cognitive behavioral therapy (CBT), exercise training, and other practices. Sleep hygiene training is considered the best practice in the treatment of insomnia. It includes going to sleep and waking up at the same time every day, exercising regularly every day and not just before bed, engaging in activities that help one relax before bed, keeping the bedroom quiet and controlling the temperature, not consuming caffeine and nicotine at least 6 hours before going to bed, avoiding heavy alcohol consumption, avoiding naps, and not consuming a large amount of fluid before bedtime (Chung et al., 2018).

Cognitive behavioral therapy is used in the treatment of insomnia. It can be done on the Internet by watching videos, reading self-help guides, and participating in individual or group sessions (Squires et al., 2022). Cognitive behavioral therapy is preferred over pharmacological treatment especially for short-term insomnia. The reason is that medication-related side effects (dizziness, sleepiness, addiction, etc.) do not occur (Riemann et al., 2017).

Exercises comprise resistance exercise, aerobics, and stretching. In their systematic review, Kovacevic et al. (2018) reported

that resistance exercises had acute and chronic positive effects on improving sleep quality. Another study reported that moderate-intensity resistance exercise and stretching were effective for chronic insomnia (D'Aurea et al., 2019). Other interventions include hypnosis, acupuncture, acupressure, massage, aromatherapy, music, and herbal treatments (Hrehová & Mežian, 2021).

The aim of this systematic review was to examine the efficacy of non-pharmacological approaches for sleep problems of cancer patients in palliative care.

Method

Study Design

This systematic review was prepared in accordance with the PRISMA-P (Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols 2015 Statement) (Moher et al., 2015).

Studies included in the systematic review were selected according to the PICOS model proposed by the Joanna Briggs Institute (Institute, 2017).

Search Strategy

P (Population, characteristics of participants): Palliative care cancer patients with sleep problems regardless of gender, race, or economic status are the target group of this review.

I (Intervention, intervention characteristics): The use of non-pharmacologic interventions in palliative care cancer patients with sleep problems constituted the intervention group of this systematic review.

C (Comparison): The studies included in the review were compared in terms of the effectiveness of non-pharmacologic interventions in palliative care cancer patients with sleep problems.

O (Outcomes): Non-pharmacological methods such as therapeutic touch, white light, aromatherapy, and massage applied to reduce sleep problems in palliative care cancer patients were examined.

S (Study design): Randomized controlled, full-text studies in English and Turkish were included in the review.

This systematic review researched through data from the last 5 years from 2018 to 2023 in Scopus, Web of Science, CINAHL, PubMed, Medline, Ulakbim National Database, and Cochrane Library databases between December 2022 and January 2023 using the English keywords "palliative care, sleep disorder, non-pharmacologic, insomnia, cancer, randomized controlled study." The national and international literature state that narrowing down the publication year may be useful for searching systematic review (Karaçam, 2013, Yannascoli et al., 2013). In addition, Cochrane review's report evaluating 100 systematic reviews reports that reviews require updating and the median duration is 5.5 years (Higgins et al., 2022). In line with this information, the systematic review was limited

to the last 5 years in order to reflect the current literature. The literature search was performed independently by both researchers, who discussed whether the selected articles met the search criteria. At the end of the discussion, it was decided that the articles fit the purpose of the review. As a result of the review, 90 articles were found. The number of studies reached as a result of the search was categorized and given in the flow chart (Figure 1). The titles and abstracts of the studies were examined and repetitive studies were eliminated. The risk of bias was independently assessed by the researchers and it was found that the risk of bias was moderate (Figure 2).

Inclusion Criteria

Palliative care cancer patients regardless of gender, race, or socioeconomic status:

- Palliative care cancer patients in whom non-pharmacologic interventions are applied to address sleeping problems that develop in cancer patients.
- Patients for whom nonpharmacological interventions such as aromatherapy, massage, white bright light therapy, and therapeutic touch were considered.
- Randomized controlled trials in Turkish or English from the last 5 years were included in this systematic review.

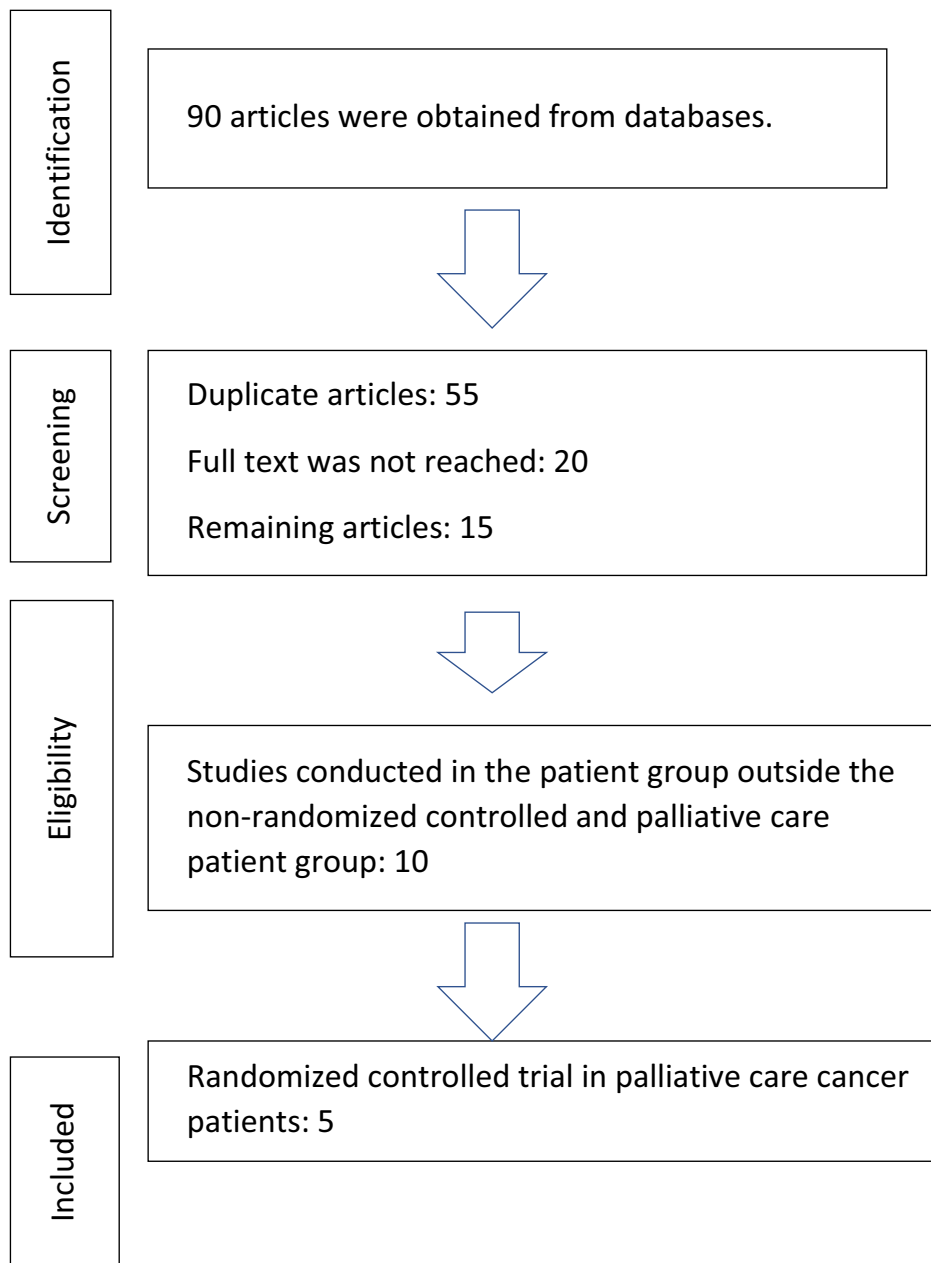


Figure 1.
PRISMA-P Flowchart.

Studies	Risk of bias summary					
	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Selective reporting	Other bias
Yıldırım et al., 2020	(+)	(-)	(-)	?	(-)	(-)
Miladinia et al., 2023	(+)	(+)	(+)	(+)	(+)	(+)
Kawabata et al., 2020	(+)	(+)	(+)	(+)	(+)	(+)
Çelik and Yeşilbalkan, 2022	(+)	(+)	(+)	(+)	(-)	(+)
Ünal Aslan and Çetinkaya, 2022	(+)	(+)	(-)	?	(-)	(-)

“+”: Low risk, “-”: High risk, “?”: Unclear risk

Figure 2.
Risk of Bias Summary in the Systematic Review.

Assessment of Studies

To ensure that the quality assessment for studies included in the systematic review was valid and reliable, we used the “Bias assessment tool for randomized controlled trials” recommended by the Cochrane Library was used. This tool assessed randomization method, confidentiality of randomization information, blinding of participants and implementers, incomplete outcome data, and selective reporting criteria. In the assessment tool, low-risk situations were marked with (+), high-risk situations were marked with (-), and situations not fully explained in the study were marked with (?). The high number of low-risk situations indicates low study bias (Higgins et al., 2011).

Results

5 randomized controlled trials were included in this systematic review. In the study evaluating the effect of lavender oil on vital signs and sleep quality, it is stated that it is effective in improving sleep quality while it has no effect on vital signs (Yıldırım et al., 2020). Other study evaluating different massage intensities, it is reported that there is at least a 30% reduction in insomnia symptoms compared to baseline (Miladinia et al., 2023). It has been understood that aromatherapy massage applied one is not effective in improving sleep quality (Kawabata et al., 2020). Bright white light was found to be effective in improving sleep quality and total duration. Red light was also found to be effective in improving sleep quality (Çelik & Usta Yeşilbalkan, 2022). The therapeutic touch to spiritual care has had an impact on sleep quality (Ünal Aslan & Çetinkaya, 2021) Table 1.

Discussion

Sleep problems in palliative care are one of the most important problems affecting the quality of life of cancer patients. Effective treatment of these problems prevents physiological and psychological problems that may arise from insomnia. The purpose of this review was to examine studies offering an evaluation of nonpharmacological methods for the treatment of sleep problems in cancer patients in palliative care.

The review included 5 randomized controlled trials in accordance with the literature review of the past 5 years (Çelik & Usta Yeşilbalkan, 2022; Kawabata et al., 2020; Miladinia et al., 2023; Yıldırım et al., 2020; Ünal Aslan & Çetinkaya, 2021). The studies included in the review assessed the effectiveness of several

alternative and complementary methods for the treatment of sleep problems for palliative care patients, finding that the number of studies conducted so far was insufficient to examine a single method. This is a major methodological limitation of this study. Therefore, no comparison of sample size, intervention duration, and effectiveness could be made with the included studies. However, all studies included in the review had randomized control groups. In the reviewed studies, sample sizes were found to be generally equal and met the minimum number required for an experimental study (Çelik & Usta Yeşilbalkan, 2022; Kawabata et al., 2020; Ünal Aslan & Çetinkaya, 2022; Yıldırım et al., 2020). One study was a 7-arm randomized controlled trial, and although the sample size was large, the sample size in each group was similar to that in other studies (Miladinia et al., 2023). The studies included in the review used the Richards–Campbell Sleep Scale, Pittsburg Sleep Quality Index, Visual Analogue Scale (VAS), and subjective data to assess sleep problems and sleep quality (Kawabata et al., 2020; Miladinia et al., 2023; Ünal Aslan & Çetinkaya, 2021; Yıldırım et al., 2020), while one study used a smart wristband to provide objective data (Çelik & Usta Yeşilbalkan, 2022). Although all studies used scales with a high level of validity and reliability (Akman et al., 2015; Richards et al., 2000), the measurement of objective data in only one study was one of the methodological limitations.

Massage therapy was the most commonly applied method in the management of sleep problems for palliative care patients in the included studies. Massage therapy was applied alone or in combination with aromatherapy (Kawabata et al., 2020; Miladinia et al., 2023). Other studies examined in the review administered non-pharmacological methods such as therapeutic touch and white bright light in the management of sleep problems for palliative care patients (Çelik & Usta Yeşilbalkan, 2022; Kawabata et al., 2020; Miladinia et al., 2023; Ünal Aslan & Çetinkaya, 2021; Yıldırım et al., 2020). A study by Yıldırım et al. (2020) examined the effectiveness of aromatherapy, lavender oil inhaled by patients, who then demonstrated improvements in their sleep patterns. In a study by Kawabata et al. orange, lavender, or a mixture of these two oils were applied to patients with a massage. However, the study reported that there was no significant difference between the sleep quality of the intervention and experimental groups. The most important reason for this result was that the sample consisted of geriatric patients and they slept comfortably whether aromatherapy massage was applied or not (Kawabata et al., 2020). Although the number of

Table 1.
Summary of Studies Covered in the Review

First Author/ Year	Method	Objective	Sample	Intervention	Comparison	Assessment	Findings
Yildirim et al., 2020	RCTs	We intended to determine the effect of lavender oil on sleep quality and vital signs in palliative treatment.	Thoracic surgery inpatients in palliative care (GG:34, KG:34)	Patients in the intervention group were asked to take 10 deep breaths of 3 mL of 100% lavender oil on the bedside table before going to bed (at 10:00 p.m.).	None	Vital signs and sleep quality were measured using the Richards-Campbell Sleep Scale.	Lavender oil has no effect on vital signs. However, it is effective in improving sleep quality.
Miladinia et al., 2023	7-arm RCT's	Evaluation of response to various massage doses for pain-fatigue-sleep symptom cluster	Patients in palliative care (GG: 234/6 arm, KG: 39)	Six different massage doses varying according to the weekly session (2 or 3) and slow-stroke back massage (neck to sacrum) were evaluated according to the length of the massage (15, 30, 60 minutes).	None	Using a diary designed by the investigator, the results were evaluated weekly for 4 weeks. Symptom intensity and numerical rating scales were used.	Massage of varying intensity has been found to reduce insomnia symptoms by at least 30% compared to baseline.
Kawabata et al., 2020	RCTs	The effects of a single 30-minute aromatherapy massage session at night were measured.	Hospitalized in palliative care. GG: 27 KG: 30	Between 08:00 p.m. and 09:00 p.m., aromatherapy massage (eupherage) was applied. Each session lasted 30 minutes. The massage was performed by applying pressure from the sole of the foot to the knee area.	None	Richards-Campbell Sleep Scale, short fatigue scale	A single aromatherapy massage session is no more effective than no massage in improving sleep.
Çelik and Usta Yeilbalkan, 2022	RCTs	This study aimed to examine the effect of bright white light on fatigue level and sleep in palliative care cancer patients.	GG: 26 KG: 26	Bright white light (10,000 lux) was applied every morning for 30 minutes for 14 days.	Red light (<50 lux) was applied every morning for 30 minutes for 14 days.	Bright white light was found to be effective in improving sleep quality and total duration. Red light was also found to be effective in improving sleep quality.	Brief fatigue scale, Pittsburgh sleep quality scale, patient follow-up form, smart wristband to measure sleep time
Ünal Aslan and Çetinkaya, 2021	RCTs	We aimed to examine the effect of therapeutic touch on spiritual care and sleep quality in palliative care patients.	GG: 36 KG: 37	Therapeutic touch (rhythmic and soft movements without applying pressure) was applied by the researcher for 15 minutes between 6:00 p.m. and 09:00 p.m., three times a week.	None	An increase in sleep quality and spiritual care levels of the intervention group 4 weeks after the application of therapeutic touch.	Spirituality and spiritual care assessment scale, Pittsburgh Sleep Quality scale

studies examining the effect of aromatherapy on sleep quality in palliative care patients is limited, there are studies examining the effect of aromatherapy on sleep problems in different patient groups. Ozkaraman et al. (2018)'s study investigated the effect of lavender and tea tree oil on sleep problems in patients receiving chemotherapy and found a significant increase in sleep quality among patients who applied lavender oil. Another study examining the effect of lavender and peppermint oil on cancer patients reported that aromatherapy improved sleep quality (Hamzeh et al., 2020). In line with these studies, aromatherapy is reported to be an effective method of intervention in the management of sleep quality and sleep problems, but more substantiated studies with a higher impact are needed, especially with respect to palliative care patients.

One of the methods used to improve sleep quality in palliative care is massage. Miladinia et al. (2023) evaluated the effect of different doses of massage in a seven-arm randomized controlled trial. The study found that an increased dose of massage led to alleviated symptoms. In the literature, there are studies reporting that massage is an effective non-pharmacological method in the management of sleep problems in different patient groups other than palliative care (Arslan et al., 2021; Hsu et al., 2019; Oshvandi et al., 2021).

A study examining the effect of therapeutic touch on sleep quality in palliative care reported that 15 minutes of therapeutic touch applied to patients positively affected sleep quality (Ünal Aslan & Çetinkaya, 2021). In previous studies with COPD patient groups, therapeutic touch was shown to have a positive effect on the management of sleep problems (Çalışkan & Cerit, 2021). A study by Bağcı and Çınar Yücel (2020) found that therapeutic touch increased sleep comfort in geriatric patients.

White light is another alternative and complementary approach used in symptom management. In one of the studies included in the review, white light was applied to patients in palliative care for 30 minutes in the morning for 2 weeks. Red light was applied to the control group. When the two groups were compared, a significant increase in sleep duration and quality was observed in the white light group (Çelik & Usta Yeşilbalkan, 2022). Different studies in the literature have reported that white light positively affects sleep disorders and quality despite different application times (Kim et al., 2021; Weiss et al., 2018).

The management of sleep problems of cancer patients treated in palliative care can reduce their risk of developing physiological and psychological problems. There is limited research on the effect of non-drug methods that nurses can apply to improve sleep quality which is why we dwell on methods such as aromatherapy, massage, therapeutic touch, and white light, which are reported to be effective in reducing sleep problems. However, further studies are needed to investigate the effect of other methods that may be effective in insomnia management.

Study Limitations

This review has some limitations. The most important limitation is that not all scanned literature could be accessed due to the databases. Another limitation is that only articles in Turkish and English were scanned. Articles published in other languages

could not be included in this review. However, considering that the language of international literature is English, the review incorporated studies with international validity.

Conclusion and Recommendations

This systematic review evaluated the results of randomized controlled trials investigating the effect of non-pharmacological methods to treat sleep problems and improve sleep quality in cancer patients receiving palliative care. Included in the literature review of the last 5 years were five randomized controlled trials that investigated the effects of aromatherapy, massage, therapeutic touch, and white light. These methods have been shown to improve sleep quality in palliative care patients. Nurses, who play an important role in the symptom control of cancer patients in palliative care, can manage patients' sleep problems using non-pharmacological methods. In the studies reviewed, each method was found to result in significant improvement in sleep quality. However, studies with high levels of evidence demonstrating the effect of these and other non-pharmacological methods can contribute to this field.

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