

A Review of Yoga as A Non-Pharmacological Approach for Sleep Disturbances in Cancer Patients

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Abstract: *Between 15 and 90% of cancer patients and survivors report having trouble falling or staying asleep, getting up too early, or experiencing some other kind of insomnia or poor sleep during and after treatment. Among the most common and upsetting issues that cancer patients and survivors describe are insomnia and poor sleep quality, which may be severe enough to raise the cancer mortality rate. Insomnia and poor sleep quality are common, but cancer patients and survivors get insufficient diagnosis and treatment for them. When sleep issues arise, doctors and patients are frequently reluctant to recommend or take medication because of worries about polypharmacies, and cognitive behavioral therapy for insomnia can be very challenging and impractical for patients to follow through their cancer journey. According to research, yoga is a well-tolerated fitness strategy that shows promise in treating survivors' insomnia and poor sleep quality. This paper offers a comprehensive analysis of the clinical studies that have been conducted on the benefits of yoga for treating cancer patients' and survivors' insomnia and poor sleep quality.*

Keywords: Yoga, rest, sleeplessness, cancer survivor, physical activity

I. INTRODUCTION

Between 15 and 90 percent of cancer patients and survivors report problems with their sleep quality both before and after treatment. These problems might include excessive daytime napping, trouble falling asleep, trouble remaining asleep, and excessive early wake-ups.¹⁻¹⁰ These problems with sleep quality are also signs of insomnia, which is characterized by one or more of these symptoms (trouble coming asleep, difficulty staying asleep, etc.) in severe and chronic forms (difficulty falling asleep, difficulty staying asleep, etc.) for at least three days a week for a month or more.¹¹ One of the most common and upsetting issues that cancer patients and survivors report is insomnia and poor quality sleep, which can worsen physical function, quality of life, adherence to cancer treatment, and, in extreme cases, raise the risk of cancer-related fatigue and depression.^{1-10, 12, 13} Insomnia and poor sleep quality are common, but cancer patients and survivors get insufficient diagnosis and treatment for them.^{1-10,12,14} Among the treatments for insomnia and poor sleep quality are:

- 1) medications, which don't actually cure insomnia and can cause toxicities, adverse interactions with cancer treatments, dependency, and rebound impairment when taken off;
- 2) conventional exercise, which is advised in treatment guidelines but isn't often included in survivorship care plans other than as generalized statements encouraging survivors to be active; and
- 3) psychobehavioral interventions.^{1-10,13} There is encouraging evidence that yoga, a well-tolerated exercise activity, may effectively treat insomnia and improve the quality of sleep for survivors.

Yoga: a holistic mind-body mode of exercise

Yoga is a mind-body workout that is becoming more and more popular. It is also known as a mindful kind of physical activity. Yoga comes in a wide range of forms and styles. They have their roots in Eastern traditions from China (e.g.,

Tai Chi, Chi Kung), Tibet (e.g., Tibetan), and India (e.g., Classical, Advaita Vedanta, Tantra). The Sanskrit root "yuj," which literally means "to yoke" or "join together," is where the term yoga originates. Yoga here refers to the fusion of the body and the mind. The oldest styles of yoga were deeply based in physical and mindful (breathing and contemplative) practices. These practices gave rise to what is now called classical yoga, which serves as the foundation for the majority of yoga classes offered today.¹⁹ The most common and fundamental kind of yoga, called Hatha, comprises both Gentle Hatha and Restorative yoga. It is becoming more and more accepted in conventional Western medicine as a therapeutic tool. Several yoga forms, such as Iyengar, Anusara, and others, use gentle Hatha yoga, which emphasizes the physical components of yoga. Iyengar style restorative yoga emphasizes complete relaxation. Because Gentle Hatha and Restorative yoga involve a comprehensive series of breathing, meditation, and physical alignment exercises that call for both the active and passive activation of skeletal muscles, it may be a useful method for enhancing sleep. According to available research, yoga may help cancer patients and survivors with their insomnia and poor sleep quality.

Existing scientific evidence on yoga for the treatment of insomnia and sleep quality impairment

Research suggests that yoga is helpful in treating depression, anxiety, fatigue and other conditions associated with sleep disorders among healthy individuals and those with cancer. Herein, we review the extant literature on yoga and its use in the treatment of sleep problems among cancer patients.

Yoga Programme Evaluations

According to four assessments of community yoga programs for cancer patients and survivors, yoga may help with insomnia and poor sleep quality.^{40–43} For instance, in a pioneering research by Joseph et al. comparing yoga, support therapy, and meditation therapies among cancer survivors receiving radiation therapy, participants in the yoga group reported increases in their quality of life, hunger, sleep, mood, and tolerance to treatment. Forty These yoga programs, which provided yoga lessons exclusively for cancer patients during treatment and survivors who had finished at least main therapies, were housed in community yoga studios or cancer centers. The 60–90 minute yoga lessons were provided one or two times a week and included a broad range of postures and mindfulness exercises from various styles and kinds. Additionally, participants in two of these programs linked their yoga practice to gains in strength, bodily function, and physical fitness. These studies, however, used convenience samples rather than rigorous research techniques intended to address certain scientific queries about the impact of yoga on sleep quality degradation. Additionally, these programs did not make use of standardized yoga treatments that are specifically recommended for the treatment of insomnia or poor sleep quality and that can be reliably and consistently duplicated for distribution. Lastly, none of these research used objective measures of sleep, such polysomnography or actigraphy, and instead relied only on patient claims of insomnia or poor sleep quality, some of which have not undergone thorough validation.

Phase I and II Pilot Clinical Trials

One phase I and seven phase II studies provide preliminary support for the safety, feasibility, and efficacy of yoga for improving insomnia and sleep quality impairment among cancer patients and survivors, despite the fact that there are limitations (see Limitations of Existing Scientific Data on Yoga and Sleep section to follow). The first research examining the relationship between yoga and sleep was published by Cohen et al. among survivors of adjuvant therapy. They used a validated measure of sleep quality impairment with established clinical cut offs (the Pittsburg Sleep Quality Index). These trials evaluated a range of yoga dosages, from one to five sessions per week, utilizing a number of various styles and kinds of yoga throughout a 26-week period. Classes lasted between fifty and one hundred minutes. A range of postures and mindfulness activities were included of the therapies. For cancer patients undergoing treatment as well as survivors, the treatments were judged safe and doable. Three research revealed no changes in insomnia or sleep quality impairment, whereas five studies found improvements in these areas and participant satisfaction with the yoga therapies. The first research examining the effectiveness of yoga in treating sleep issues was published by Bower et al. in . This study utilized a strict time and attention control condition in addition to blinding participants to the study hypotheses. In six of the phase II RCTs, yoga was compared to a waitlist control, in one to a control condition

including support treatment, and in another to a control condition involving health education. According to the last two studies, yoga may be a more effective treatment for insomnia and poor sleep quality than counseling, health education, patience, and focus.

Phase III Randomised Controlled Clinical Trials

The first and only multicentre, phase III, randomised controlled study investigating the effects of yoga on insomnia and sleep quality impairment was recently published by Mustian et al. The experiment included both objective actigraphy assessments and validated patient-report measures. Thirteen This scientific experiment, which compares yoga to a usual care waitlist control condition, is the most conclusive trial to date and shows that yoga is beneficial for treating insomnia and sleep quality impairment.

Thirteen the study contrasted a yoga intervention that was standardized. Additionally, individuals in yoga dramatically reduced their usage of sleep aids by 21%, compared to a 5% rise in use among control participants. Participants who adhered to the program felt the program helpful and would suggest it to other cancer survivors who were having trouble sleeping. Thirteen The majority of participants were white, well-educated women, and the results, while positive, cannot be applied to all forms of yoga (such as vigorously aerobic yoga or yoga in a heated room). Additionally, there were no long-term follow-ups to ascertain whether the benefits of yoga on sleep persisted beyond the immediate post-intervention period.

Limitations of existing scientific data on yoga and sleep

This corpus of scientific research is highly promising, but because of design constraints, it should be read cautiously. A definitive phase III RCT that was designed and powered a priori to investigate the benefits of yoga on insomnia or sleep quality impairment as a main outcome was not included in any of the phase I–II investigations. Numerous research lacked objective evaluations of sleep issues or verified patient claims of insomnia or impaired sleep quality. The sample sizes, which varied from 20 to 88, were modest.

For the purpose of determining participant eligibility, they did not screen for or demand a certain degree of insomnia or impairment in sleep quality. Except for the Bower research, none of the trials used participant blinding. The content, kind, intensity, and duration of yoga treatments were very diverse and lacked standardization, making it hard to pinpoint the precise dosage of yoga required to treat insomnia or poor sleep quality. The lack of detailed descriptions of the yoga treatments prevented standardization and reproducibility. No precise information was given on the frequency of adverse occurrences, despite the fact that overall remarks suggested that the treatments were secure and that participants loved them. There was little data on participant attendance, compliance, and attrition, as well as specifics on how the recommended yoga dosage compared to the actual dosage attained (mode, frequency, intensity, duration), and how long-lasting the improvements in sleep quality impairment brought about by yoga would be.

Many of the shortcomings of the phase I–II clinical trials were resolved in the phase III experiment. For instance, the phase III trial used a sample of 410 survivors and was suitably powered and designed a priori to test sleep as the primary outcome. The trial also used validated patient reports and objective measures of sleep, rigorously standardised the yoga intervention, and assessed the quality, fidelity, and drift of the intervention. The paper included a comprehensive description of the yoga prescription used in the intervention, as well as accurate reporting of adverse events, attendance, compliance, and attrition, as well as a comparison of the achieved and recommended dosages of yoga.

If yoga is to be taken into consideration as a treatment for insomnia, more clinical research is necessary to compare it to the gold standard treatments for insomnia, such as cognitive behavioral therapy or medication. As of now, we were unable to locate any studies that made this comparison. Furthermore, no research has looked at the specific elements of yoga, such as the breathing exercises, physical postures, and mindfulness exercises, to identify which element, if any, is most important for the health benefits associated with yoga or any potential biological mechanisms (such as circadian, muscular, cardiovascular, pulmonary, neurological, immunological, or neuroendocrine).

Yoga may help with insomnia or other sleep-related issues, but more research is required to properly customize yoga regimens to address sleep issues and the particular requirements of cancer patients and survivors. The majority of the

women in these research are educated, middle-class to upper-class Caucasian; hence, the sample populations' external validity is limited by the low variety of age, gender, social class, race, and economic status. Crucially, this makes it harder to identify which patient profile would benefit from yoga treatment the most and respond to it the best. What about the effects of, say, being a man, receiving a disease diagnosis other than breast cancer, or being a non-White person who is jobless or socially isolated?

Clinical implications

The popularity of yoga is growing worldwide, and there are numerous books, DVDs, and community and cancer center programs targeted at cancer survivors (such as "Healing Yoga," "Yoga for Breast Cancer Patients and Survivors," and "Gentle Yoga for Cancer Patients"). However, there is little to no scientific evidence supporting the effectiveness of these programs for treating insomnia or poor sleep quality in cancer survivors. There is a great deal of variation in what is provided to cancer patients and survivors as a consequence of these yoga programs' lack of professional regulation regarding teacher credentials and license, as well as adherence to best practices, standards of care, or evidence-based therapy recommendations.

For instance, several yoga programs emphasize relatively mild, low-intensity, meditative practices (like Restorative, Integral, and Svaroopa); others emphasize powerful, Ashtanga-style practices; still others emphasize a combination of the two (like Hatha, Iyengar, and Kundalini).⁴⁴ Certain yoga programs alter the yoga room by adding supports like straps, blocks, ropes, and chairs, or by employing warmers and humidifiers (like Bikram).⁴⁴ There is a wide range in class format; some emphasize physical postures exclusively and exclude mindfulness activities, while other programs combine mindfulness exercises with physical postures. The lack of regulation and the wide variation in yoga offerings, along with the small number of studies that look at the safety and efficacy of specific styles and types of yoga for addressing insomnia and sleep quality impairment among survivors, significantly increase the likelihood that patients and survivors will invest a significant amount of time, energy, and money in yoga programmes that may not be safe or effective. For instance, some survivors may not want to practice yoga in a room that is above 100 degrees, and intense yoga may cause extreme joint and muscular pain, which may worsen insomnia or reduce sleep quality. In light of this, cancer specialists may be very helpful in assisting cancer patients and survivors to engage in yoga in a safe and efficient manner.

These phase I-III studies, despite their limitations, collectively suggest that: 1) yoga can be practiced safely by cancer patients and survivors both during and after cancer treatments; 2) yoga interventions can be implemented in a variety of cancer centers and community-based yoga studios; 3) cancer patients and survivors who participate in these yoga programs find them enjoyable and beneficial; 4) low to moderate intensity yoga that includes Gentle Hatha and Restorative postures, breathing exercises, and meditation exercises ranging from one to five sessions/week for 50-120 minutes each session over a period of 4–26 weeks may improve insomnia and impair sleep quality; and 5) participation in standardised yoga programmes created specifically for cancer patients and survivors In order to assist cancer patients and survivors understand how to properly start or maintain an exercise program—in this example, yoga—during and after treatments, clinicians may provide crucial information.⁴⁵ It is beneficial for patients and survivors to be aware of any possible contraindications (such as orthopedic, cardiac, and oncologic) that may impact their tolerance and safety while exercising.⁴⁶

It is not always the case that a cancer patient or survivor with contraindications cannot practice yoga at all. In fact, this is seldom the case. Most of the time, contraindications just call for certain adjustments to the yoga practice in order to enable the person to engage in the practice safely, successfully, and benefit both physically and mentally. An excellent resource for recommendations regarding screening and evaluation of cancer patients and survivors prior to participating in yoga is the American College of Sports Medicine Exercise Guidelines for Cancer Patients and Survivors, which are the only guidelines currently based on scientific evidence (See Tables 2 and 3).⁴⁶ Furthermore, there are resources available for referrals that can assist patients and survivors in finding the most skilled and knowledgeable yoga instructors in their area, especially those with specialized training and experience working with patients and survivors of cancer or other medical conditions.

Yoga practitioners who are also cancer patients or survivors may find it helpful to know that the forms of yoga that have been scientifically proven to be safe and beneficial for enhancing sleep quality in these individuals primarily involve low- to moderately-intense Gentle Hatha or Restorative poses combined with breathing and meditation techniques. Research indicates that yoga is beneficial for people who report mild to moderate sleep quality impairment as well as clinical insomnia, continue to report sleep problems after trying pharmaceutical treatments, exhibit more than one hour of wakefulness in the middle of the night, have very poor sleep efficiency (60% or lower), or some combination of these characteristics when screening patients and survivors for sleep problems and making clinical recommendations about the use of yoga for managing sleep problems. It has been shown that patients and survivors who meet this description benefit the most from yoga practice, notably in terms of better sleep and lower drug usage.

II. SUMMARY AND FUTURE RESEARCH DIRECTIONS

The extent to which yoga can be considered effective for treating insomnia or poor sleep quality among cancer patients and survivors remains limited due to methodological limitations in the published literature, despite the fact that a definitive phase III randomized clinical trial has been published and positive results were noted from this study and the other smaller phase I-II studies preceding it. To find out whether yoga is better or equal to the current gold standard of medication and cognitive behavioral therapy for insomnia and poor sleep quality, further study is required.

In addition to objective measurements of insomnia and sleep quality impairment, studies must include established gold-standard patient reported outcomes of these conditions. Long-term follow-up evaluations (such as those conducted 3, 6, 9, and 12 months after the intervention) are also necessary for studies to ascertain the length and scope of any sleep advantages attained by yoga. Furthermore, a greater range of yoga styles and levels of difficulty need to be investigated for their safety and effectiveness in addressing sleep issues in cancer patients and survivors. Mechanistic studies and dismantling trials are required to identify the specific aspect of yoga (such as postures, breathing, or meditation) that is most effective. Additionally, yoga's beneficial effects on sleep and other toxicities associated with cancer and its treatments, such as fatigue, immune system dysfunction, cognitive decline, and fatigue, need to be investigated. Research is required to determine the best strategies for promoting yoga practice among cancer patients and survivors who are older, male, and from varied racial, economic, social, and cultural backgrounds.

To find out which patients and survivors are most likely to benefit from yoga as a sleep aid, trials are required. Studies are also required to assess how well yoga works for enhancing sleep compared to other forms of exercise like walking and strength training. Finally, studies that incorporate yoga for the care partners of cancer patients and survivors (such as a sister, brother, mother, father, child, spouse, or friend) are necessary. These individuals give the patient unpaid care and support throughout the cancer experience at significant health costs, and these trials may demonstrate that yoga is a low-cost therapeutic intervention for both patient and care partner in dyads with even greater benefits to the patient or survivor than when interventions are directed solely at the individual.

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