

## Effect of Yoga on Sleep Quality among Adult Cancer Patients: A Systematic Review Protocol

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### Review question/objective

The objective of this review is to identify the effectiveness of yoga practice on sleep quality.

More specifically, the objective is to identify the effectiveness of yoga practice in adult cancer patients over the age of 18 who are concurrently undergoing conventional treatment for cancer.

The specific review question is: What is the effect of yoga practice on sleep quality in adult cancer patients over the age of 18 who are concurrently undergoing conventional treatment for cancer?

### Background

Although research and technological advances have fostered improvement in the biomedical care delivered to cancer patients, achievements in the care of psychological and social needs faced throughout the cancer experience have not been realized.<sup>1</sup> These psychosocial needs stem from lack of information regarding diagnosis, prognosis, and treatment plans; emotional strain and uncertainty; lack of transportation to clinical appointments; disruptions in daily life, including work, school, and family dynamics; and inadequate financial resources to meet the demands of therapy and follow-up recommendations.<sup>1</sup> The cumulative effect of these stressors has a negative impact on sleep patterns, contributing significantly to the poor sleep quality often reported by cancer patients.<sup>2-9</sup>

The importance of sleep for optimal healing and recovery of cancer patients cannot be overstated, as indicated in a recent review regarding the experience of sleep-wake disturbances reported by adults with cancer.<sup>7</sup> Specific concerns described by these patients included difficulty falling asleep, premature awakenings, nonrestorative sleep, daytime drowsiness, and persistent fatigue. A recent epidemiologic investigation of the health of cancer survivors one year following diagnosis revealed a significant correlation between insomnia and increased risk of death and loss to follow-up.<sup>10</sup> Given the effects of insomnia on psychosocial indicators (quality of life and mood, among others), cancer patients consider diminished sleep quality one of the most distressing symptoms they face, particularly when sleep disturbances interfere with the management of other symptoms and persist after treatment.<sup>11</sup>

In the midst of treatment and recovery, some individuals turn to complementary and alternative medicine (CAM) to relieve recalcitrant symptoms and to enhance overall well-being. Recent population estimates indicate that among patients diagnosed with cancer, over 39% of those in the United States and 35.9% of those in Europe have used CAM.<sup>12,13</sup> CAM consists of a number of therapeutic formats, ranging from whole systems to herbal treatments to mind-body therapies.<sup>14</sup> The practice of yoga is a form of mind-body therapy, in which the power of concentrated thought and mindfulness triggers a hormonal and immunological response, evoking a state of motor and emotional arousal with associated powerful effects on the body.<sup>14-15</sup> Core components of yoga include meditation, physical postures (asanas), and breathing exercises (pranayama) designed to promote mental, physical, and spiritual well-being.<sup>15</sup>

As a framework for understanding the therapeutic mechanisms of yoga, the field of psychoneuroimmunology (PNI) emphasizes the dynamic physiological impact of emotions on the immune response.<sup>16-19</sup> As posited by the PNI framework, the nervous, immune, and endocrine systems are intricately interconnected.<sup>20</sup> The cumulative effect of negative emotions and chronic stress stimulate the sympathetic nervous system, causing an increased circulation of stress hormones and impairing the body's ability to heal and function normally.<sup>21</sup> This cascade of events places individuals at greater risk for developing inflammatory patterns of dysfunction and disease.<sup>22</sup> Interventions that induce relaxation, positive emotion, and overall well-being diminish the activation of the sympathetic nervous system, thereby alleviating the effects of stress, fostering a return to hormonal balance, and minimizing the inflammatory response.<sup>23</sup> Previous research among individuals with cancer suggests that the practice of yoga yields a range of mental and physical benefits, such as improved quality of life; reduced fatigue, stress, and depression; and enhanced physical function.<sup>24-30</sup>

Although evidence suggests that yoga practice may lead to improved sleep quality among individuals with cancer,<sup>31-33</sup> no systematic review examining the effect of yoga practice on sleep quality among adult cancer patients was identified by initial searches of the Cochrane Library of Systematic Reviews, JBI Library of Reviews, CRD DARE database, CRD PROSPERO database, or other bibliographic databases, such as EMBASE, CINAHL, PubMed/MEDLINE. The proposed systematic review will contribute to the understanding of the effect of yoga practice on adult cancer patients undergoing treatment and will also identify areas for further research.

## **Keywords**

Cancer; yoga; sleep quality

## **Inclusion criteria**

### ***Types of participants***

This review will consider studies that include adults over the age of 18 years diagnosed with cancer (regardless of the type of cancer, stage, or presence of co-morbidities) who are currently undergoing conventional treatment for cancer (regardless of treatment modality, intensity, delivery, frequency, or duration of treatment).

### ***Types of intervention***

This review will consider studies that evaluate the effects of yoga intervention (regardless of mode of delivery, timing, frequency, duration) on sleep quality among adult cancer patients over the age of 18 years who are concurrently undergoing conventional treatment for cancer.

The review will exclude studies using yoga as part of a multimodal intervention (including mindfulness-based stress reduction), rather than yoga as the main intervention.

For the purposes of this review, yoga intervention will include practices that incorporate the use of yoga skills (including but not limited to Hatha yoga, Iyengar yoga, and restorative yoga).

### ***Types of outcomes***

This review will consider studies that include the following outcome measures: sleep quality, measured by standardized, validated instruments, such as the Pittsburgh Sleep Quality Index and other measures.

### ***Types of studies***

The review will consider any randomized controlled trials (RCTs); in the absence of RCTs, other research designs, such as non-randomized controlled trials and before and after studies, will be considered for inclusion to enable the identification of current best evidence regarding yoga practice.

## **Search strategy**

The search strategy aims to find both published and unpublished studies. A three-step search strategy will be utilised in this review. An initial limited search of MEDLINE and CINAHL will be undertaken followed by analysis of the text words contained in the title and abstract, and of the index terms used to describe article. A second search using all identified keywords and index terms will then be undertaken across all included databases. Thirdly, the reference list of all identified reports and articles will be searched for additional studies. Studies published in English will be considered for inclusion in this review. All published studies will be considered for inclusion in this review.

The databases to be searched include:

CINAHL

PubMed/MEDLINE

Cochrane Library (CENTRAL)

EMBASE

PsycINFO

The search for unpublished studies will include:

Dissertation Abstracts Online

ProQuest Dissertations and Theses

Initial keywords to be used will be:

cancer

yoga

sleep quality

## **Assessment of methodological quality**

Papers selected for retrieval will be assessed by two independent reviewers for methodological validity prior to inclusion in the review using standardised critical appraisal instruments from the Joanna Briggs Institute Meta Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI) (Appendix I). Any disagreements that arise between the reviewers will be resolved through discussion, or with a third reviewer.

## **Data collection**

Data will be extracted from papers included in the review using the standardised data extraction tool from JBI-MAStARI (Appendix II). The data extracted will include specific details about the interventions, populations, study methods and outcomes of significance to the review question and specific objectives.

## **Data synthesis**

Quantitative papers will, where possible, be pooled in a statistical meta-analysis using JBI-MAStARI. All results will be subject to double data entry. Effect sizes expressed as odds ratio (for categorical data) and weighted mean differences (for continuous data) and their 95% confidence intervals will be calculated for analysis. Heterogeneity will be assessed using the standard Chi-square. Where statistical pooling is not possible the findings will be presented in narrative form, including tables and figures to aid in data presentation where appropriate.

### ***Conflicts of interest***

No conflict of interest is anticipated.

## **Acknowledgements**

None to declare.

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## Appendix I: Appraisal instruments

### MAStARI Appraisal instrument

#### JBI Critical Appraisal Checklist for Randomised Control / Pseudo-randomised Trial

Reviewer ..... Date .....

Author ..... Year ..... Record Number .....

	Yes	No	Unclear	Not Applicable
1. Was the assignment to treatment groups truly random?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Were participants blinded to treatment allocation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Was allocation to treatment groups concealed from the allocator?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Were the outcomes of people who withdrew described and included in the analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Were those assessing outcomes blind to the treatment allocation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Were the control and treatment groups comparable at entry?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Were groups treated identically other than for the named interventions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Were outcomes measured in the same way for all groups?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Were outcomes measured in a reliable way?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Was appropriate statistical analysis used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Overall appraisal:    Include                   Exclude                   Seek further info.

Comments (Including reason for exclusion)

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## Appendix II: Data extraction instruments

### MAStARI data extraction instrument

#### JBI Data Extraction Form for Experimental / Observational Studies

Reviewer ..... Date .....

Author ..... Year .....

Journal ..... Record Number .....

#### Study Method

RCT  Quasi-RCT  Longitudinal

Retrospective  Observational  Other

#### Participants

Setting \_\_\_\_\_

Population \_\_\_\_\_

#### Sample size

Group A \_\_\_\_\_ Group B \_\_\_\_\_

#### Interventions

Intervention A \_\_\_\_\_

Intervention B \_\_\_\_\_

Authors Conclusions: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Reviewers Conclusions: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Study results**

**Dichotomous data**

Outcome	Intervention ( ) number / total number	Intervention ( ) number / total number

**Continuous data**

Outcome	Intervention ( ) number / total number	Intervention ( ) number / total number