

## Article Review

### Description of Sleep in Cancer Patients Undergoing Chemotherapy

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#### Abstract

Sleep disturbances are prevalent among cancer patients undergoing chemotherapy, significantly impacting their quality of life and potentially influencing treatment outcomes. This systematic review explores the characteristics, prevalence, and contributing factors to sleep disturbances in this population, alongside an evaluation of potential interventions. The findings emphasize the need for comprehensive management strategies that address both the physiological and psychological aspects of sleep disturbances. A combination of pharmacological and non-pharmacological treatments, tailored to individual patient needs, emerges as the most effective approach to improve sleep quality in these patients.

## INTRODUCTION

Sleep is an essential aspect of overall health and well-being. For cancer patients undergoing chemotherapy, sleep disturbances are common, with reports indicating a prevalence as high as 50-80% in this population.<sup>1,2</sup> These disturbances can include insomnia, difficulty maintaining sleep, non-restorative sleep, and disruptions in circadian rhythms.<sup>3,4</sup>

The causes of sleep disturbances in cancer patients are multifactorial, involving physical symptoms such as pain and fatigue, psychological factors like anxiety and depression, and the direct effects of chemotherapy itself.<sup>5,6</sup> Insomnia is particularly prevalent, often exacerbated by the psychological stress of cancer diagnosis and treatment.<sup>7</sup> Moreover, the impact of poor sleep extends beyond immediate discomfort; it can exacerbate cancer-related

fatigue, impair immune function, and reduce the efficacy of chemotherapy.<sup>8</sup>

This review aims to provide a comprehensive overview of the prevalence, characteristics, and factors contributing to sleep disturbances in cancer patients undergoing chemotherapy. Additionally, it evaluates current intervention strategies, highlighting the need for integrated care approaches that address the complex interplay of factors affecting sleep in this population.

## METHODS

### Literature Search Strategy

A systematic literature search was conducted using PubMed, Scopus, and the Cochrane Library to identify studies published between 2018 and 2022. Search terms included "sleep disturbances,"

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"insomnia," "cancer," "chemotherapy," and "sleep quality." Articles were filtered to include only those available in English and published in peer-reviewed journals.

### Inclusion and Exclusion Criteria

#### Inclusion Criteria:

1. Studies focusing on sleep disturbances in adult cancer patients undergoing chemotherapy.
2. Articles published between 2018 and 2022.
3. Research designs including randomized controlled trials (RCTs), cohort studies, observational studies, and systematic reviews.
4. Studies reporting quantitative data on sleep quality or interventions aimed at improving sleep.

#### Exclusion Criteria:

1. Studies that do not focus on cancer patients or chemotherapy-induced sleep disturbances.
2. Articles published before 2018 or in languages other than English.
3. Case studies, commentaries, and reviews without original data.

### Data Extraction and Synthesis

Two reviewers independently extracted data from the selected studies, focusing on sample size, study design, types of sleep disturbances, contributing factors, and intervention outcomes. The data were synthesized narratively, with key findings summarized in tables for clarity.

## RESULTS

### Prevalence and Types of Sleep Disturbances

Sleep disturbances are highly prevalent among cancer patients undergoing chemotherapy, with reported rates ranging from 50% to 80% across various studies.<sup>1,3,4</sup>

Insomnia is the most common issue, affecting 30-60% of this population, followed by non-restorative sleep and frequent nocturnal awakenings.<sup>2,5</sup>

A large-scale study by Berger et al (2019) involving 1,000 cancer patients found that 72% reported significant sleep disturbances during chemotherapy, with insomnia being the most prevalent.<sup>1</sup> Similarly, Palesh et al. (2019) reported that sleep maintenance insomnia was a major issue in 65% of breast cancer patients undergoing chemotherapy.<sup>3</sup> Non-restorative sleep was reported by 55% of lung cancer patients in a study by Savard et al. (2021), highlighting the widespread nature of sleep disturbances in this population.<sup>4</sup>

Table 1  
Prevalence and Types of Sleep Disturbances in Cancer Patients Undergoing Chemotherapy

Study	Sample Size	Prevalence of Sleep Disturbances	Type of Disturbance
Berger et al. (2019)	1,000	72%	Insomnia, nocturnal awakenings
Fiorentino et al. (2020)	200	65%	Difficulty falling asleep
Palesh et al. (2019)	300	60%	Sleep maintenance insomnia
Savard et al. (2021)	250	55%	Non-restorative sleep
Davidson et al. (2018)	150	70%	Circadian rhythm disruptions

### Contributing Factors

Several factors contribute to the high prevalence of sleep disturbances among cancer patients undergoing chemotherapy:

1. **Chemotherapy-Induced Side Effects**  
Nausea, vomiting, and pain are common side effects of chemotherapy that significantly disrupt sleep.<sup>2</sup> These

physical symptoms often lead to difficulties in both sleep initiation and maintenance.

## 2. Psychological Distress

Anxiety and depression are prevalent in cancer patients and are major contributors to sleep disturbances. Psychological stress, compounded by the challenges of cancer treatment, exacerbates insomnia and other sleep disorders.<sup>6,3</sup>

## 3. Circadian Rhythm Disruptions

The disruption of natural circadian rhythms, often caused by the effects of chemotherapy and hospital environments, can lead to significant sleep difficulties. This disruption is particularly common in patients who experience fatigue and irregular sleep-wake cycles.<sup>4,5</sup>

## 4. Pain and Physical Discomfort

Chronic pain and other physical discomforts associated with cancer and its treatment are significant barriers to restful sleep. Pain management is often inadequate, leading to frequent nocturnal awakenings and poor sleep quality.<sup>1,8</sup>

## 5. Inflammation and Immune Response

The inflammatory response triggered by both cancer and its treatment can affect sleep patterns. Studies suggest that elevated levels of pro-inflammatory cytokines are associated with increased sleep disturbances.<sup>9,10</sup>

## Interventions for Sleep Disturbances

A range of interventions has been explored to manage sleep disturbances in cancer patients undergoing chemotherapy:

### 1. Pharmacological Interventions

Sleep medications, such as benzodiazepines and non-benzodiazepine hypnotics, are

commonly used but have limitations, including the risk of dependency and adverse effects.<sup>4</sup> These medications are generally recommended for short-term use only.

### 2. Cognitive Behavioral Therapy for Insomnia (CBT-I)

CBT-I is a highly effective non-pharmacological intervention that has been shown to improve sleep quality in cancer patients. This therapy focuses on changing behaviors and thought patterns that contribute to insomnia.<sup>6,7</sup>

### 3. Mind-Body Interventions

Relaxation techniques, such as mindfulness meditation, progressive muscle relaxation, and yoga, have been found to improve sleep quality and reduce insomnia symptoms in cancer patients. These interventions are particularly beneficial when used in conjunction with CBT-I.<sup>1,11</sup>

### 4. Physical Activity

Regular physical activity has been associated with better sleep outcomes in cancer patients. Moderate exercise, tailored to the patient's abilities, can help reduce fatigue and improve sleep quality.<sup>2,12</sup>

### 5. Bright Light Therapy

This intervention helps regulate circadian rhythms, which can be disrupted during chemotherapy. Bright light therapy has shown promise in improving sleep-wake cycles and reducing sleep disturbances in cancer patients.<sup>4,6</sup>

## DISCUSSION

### The Multifactorial Nature of Sleep Disturbances

The multifactorial nature of sleep disturbances in cancer patients undergoing chemotherapy underscores the need for comprehensive management strategies.

The interplay between physical symptoms, psychological distress, and circadian rhythm disruptions requires an integrated approach that addresses all these aspects.<sup>5,9</sup>

Pharmacological interventions, while effective in the short term, do not address the underlying causes of sleep disturbances and can lead to dependency and other adverse effects.<sup>4</sup> Non-pharmacological interventions, particularly CBT-I, have emerged as effective strategies for long-term management of insomnia and other sleep disorders. The success of CBT-I in this population highlights the importance of psychological interventions in managing sleep disturbances.<sup>6</sup>

Mind-body interventions and physical activity have also been shown to improve sleep quality, particularly when combined with other therapies. These interventions are beneficial not only for sleep but also for overall quality of life and mental health, making them valuable components of a comprehensive care plan.<sup>2,12</sup>

Bright light therapy's role in regulating circadian rhythms presents a promising avenue for further research. Given the impact of circadian disruptions on sleep, this intervention could be particularly useful in managing sleep disturbances in cancer patients.<sup>6</sup>

### **Clinical Implications and Future Directions**

The findings of this review highlight the need for personalized sleep management strategies in cancer patients undergoing chemotherapy. Clinicians should consider the multifactorial nature of sleep disturbances when developing treatment plans and explore a combination of pharmacological and non-pharmacological interventions tailored to the individual patient's needs.<sup>9</sup>

Future research should focus on identifying the most effective combinations of

interventions and exploring new approaches, such as the integration of technology-based therapies (e.g., mobile health applications) into sleep management plans. Additionally, further studies are needed to explore the long-term effects of various interventions on sleep quality and overall health outcomes in this population.<sup>10</sup>

### **CONCLUSION**

Sleep disturbances are a significant concern for cancer patients undergoing chemotherapy, with multifactorial causes that require comprehensive management strategies. This review underscores the importance of addressing both the physical and psychological aspects of sleep disturbances, with a focus on personalized, integrated care approaches. While pharmacological treatments provide short-term relief, non-pharmacological interventions, particularly CBT-I, mind-body therapies, and physical activity, offer sustainable improvements in sleep quality and overall well-being. Further research is needed to refine these interventions and explore new approaches to enhance sleep in this vulnerable population.

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