



“Sleep Disturbances Among Patients Receiving Cancer Treatment: A Narrative Review”

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Abstract: Sleep disturbances are among the most prevalent and distressing symptoms experienced by patients undergoing cancer treatment. Insomnia, fragmented sleep, excessive daytime sleepiness, restless legs syndrome, circadian rhythm disruption, and obstructive sleep apnea are frequently reported throughout the cancer continuum. These disorders adversely affect physical functioning, emotional well-being, immune function, cognitive performance, treatment adherence, and overall quality of life. The causes of sleep disturbances in cancer patients are multifactorial, involving the direct effects of malignancy, chemotherapy, radiotherapy, surgery, immunotherapy, hormonal therapy, pain, fatigue, psychological distress, and environmental factors. Despite their high prevalence, sleep disorders remain underrecognized and undertreated in oncology settings. Early assessment and evidence-based management are essential to minimize complications and improve patient outcomes. Both pharmacological and non-pharmacological interventions have demonstrated effectiveness, with cognitive behavioral therapy for insomnia (CBT-I), sleep hygiene education, physical activity, relaxation techniques, mindfulness, and psychosocial support emerging as preferred first-line strategies. Oncology nurses play a central role in identifying sleep problems, educating patients, implementing evidence-based interventions, coordinating multidisciplinary care, and evaluating treatment outcomes. This narrative review discusses the prevalence, pathophysiology, risk factors, assessment methods, management strategies, and nursing responsibilities related to sleep disturbances among patients receiving cancer treatment while highlighting future directions for improving sleep health in oncology care.

Keywords: Sleep disturbances, Cancer, Insomnia, Oncology nursing, Chemotherapy, Radiotherapy, Sleep quality, Fatigue, Cognitive behavioral therapy, Quality of life.

Introduction

Cancer remains one of the leading causes of morbidity and mortality worldwide, affecting millions of individuals each year. Advances in early diagnosis, targeted therapies, immunotherapy, chemotherapy, radiotherapy, and supportive care have significantly improved survival rates across many cancer types. However, these therapeutic advances have also increased the importance of managing treatment-related symptoms that negatively affect patients' quality of life. Among these symptoms, sleep disturbances have emerged as one of the most common yet frequently overlooked complications experienced throughout the cancer journey.

Sleep is a fundamental physiological process essential for physical restoration, immune regulation, emotional stability, memory consolidation, and overall health. Adequate sleep

promotes tissue repair, hormonal balance, cognitive performance, and psychological resilience. In patients with cancer, poor sleep compromises immune function, increases fatigue, worsens pain perception, contributes to anxiety and depression, and reduces the ability to tolerate anticancer therapies. Consequently, maintaining healthy sleep patterns has become an important component of comprehensive oncology care.

Studies indicate that approximately 30–60% of the general adult population experience occasional sleep problems, whereas the prevalence among patients receiving cancer treatment ranges from 40% to 80%, depending on cancer type, disease stage, and treatment modality. Sleep disturbances may develop before diagnosis because of anxiety or tumor-related symptoms, worsen during active treatment, and persist long after treatment completion.



Unfortunately, many patients consider sleep problems to be an unavoidable consequence of cancer and therefore fail to report them to healthcare providers. Likewise, sleep assessment is often overshadowed by the management of more visible symptoms such as pain, nausea, or fatigue.

The causes of sleep disturbances in cancer patients are highly complex. Tumor-related pain, chemotherapy-induced nausea, hormonal changes, corticosteroid therapy, hospitalization, emotional distress, depression, treatment schedules, environmental noise, and circadian rhythm disruption all contribute to impaired sleep quality. These factors frequently interact with one another, resulting in chronic sleep impairment that adversely affects recovery and survivorship.

Increasing recognition of the relationship between sleep quality and cancer outcomes has prompted greater emphasis on routine sleep assessment and multidisciplinary symptom management. Healthcare professionals now recognize that improving sleep not only enhances patient comfort but also supports treatment adherence, psychological well-being, immune function, and overall clinical outcomes.

This narrative review examines the prevalence, causes, clinical consequences, assessment methods, and management of sleep disturbances among patients receiving cancer treatment, with particular emphasis on the essential role of oncology nurses in promoting healthy sleep and improving quality of life.

Sleep Disturbances in Cancer Patients

Sleep disturbance is a broad term describing alterations in sleep quantity, quality, timing, or continuity that impair normal daytime functioning. Patients undergoing cancer treatment commonly experience multiple forms of sleep disorders simultaneously, making diagnosis and management particularly challenging.

Insomnia is the most frequently reported sleep disorder among cancer patients and is characterized by difficulty initiating sleep, maintaining sleep, early morning awakening, or non-restorative sleep despite adequate opportunity for rest. Acute insomnia may occur during diagnosis or initiation of treatment, whereas chronic insomnia often persists for months or years after therapy has been completed. Persistent insomnia contributes to fatigue, impaired concentration, mood disturbances, decreased treatment adherence, and poorer quality of life.

Sleep fragmentation is another common complaint. Patients frequently awaken during the night because of pain, urinary frequency, medication side effects, coughing, shortness of breath, or anxiety. Repeated awakenings reduce sleep efficiency and prevent progression into deeper restorative sleep stages.

Excessive daytime sleepiness also affects many individuals receiving chemotherapy or radiotherapy. Patients often experience overwhelming daytime fatigue despite prolonged nighttime sleep. This symptom may result from disrupted nocturnal sleep, anemia, medications, metabolic abnormalities, or the underlying malignancy itself.

Circadian rhythm disturbances are increasingly recognized among patients undergoing prolonged hospitalization or intensive cancer treatment. Frequent nighttime nursing procedures, exposure to artificial lighting, irregular meal schedules, and reduced daytime physical activity interfere with the body's biological clock, leading to delayed sleep onset, daytime drowsiness, and reduced sleep quality.

Restless legs syndrome and periodic limb movement disorder may also occur, particularly among patients with iron deficiency, chemotherapy-induced neuropathy, or renal dysfunction. These conditions produce uncomfortable sensations in the legs accompanied by an irresistible urge to move, making it difficult to fall asleep or remain asleep.

Obstructive sleep apnea is another condition that may coexist with cancer, particularly among older adults and patients with obesity or head and neck malignancies. Untreated sleep apnea contributes to daytime fatigue, cardiovascular complications, impaired cognition, and reduced overall health status.

Many cancer patients experience more than one sleep disorder simultaneously, making comprehensive assessment essential for accurate diagnosis and effective treatment.

Causes and Risk Factors for Sleep Disturbances

Sleep disturbances during cancer treatment arise from a complex interaction of biological, psychological, treatment-related, and environmental factors.

Cancer itself can directly interfere with normal sleep. Tumor growth may produce persistent pain, respiratory difficulty, gastrointestinal symptoms, hormonal disturbances, neurological complications, or inflammatory responses that disrupt sleep architecture. Advanced cancers are particularly associated with chronic pain and nocturnal symptom burden.



Chemotherapy is one of the leading contributors to sleep impairment. Many chemotherapy agents cause nausea, vomiting, peripheral neuropathy, mucositis, hot flashes, gastrointestinal disturbances, fatigue, and corticosteroid-induced insomnia. Corticosteroids administered as antiemetics frequently produce restlessness, increased alertness, mood changes, and delayed sleep onset.

Radiotherapy may also contribute to sleep disturbances through fatigue, skin irritation, pain, inflammation, and localized discomfort. Patients receiving radiation for head and neck cancers may experience xerostomia, dysphagia, and airway discomfort that interfere with normal sleep.

Hormonal therapies used in breast and prostate cancers frequently produce menopausal symptoms including hot flashes, night sweats, and mood disturbances. These symptoms commonly result in repeated nighttime awakenings and poor sleep quality.

Psychological distress is another major contributor. The emotional impact of receiving a cancer diagnosis often leads to anxiety, fear of recurrence, depression, uncertainty about the future, financial concerns, and altered family relationships. Persistent psychological stress activates neuroendocrine pathways that interfere with normal sleep regulation.

Pain remains one of the strongest predictors of poor sleep among oncology patients. Uncontrolled pain delays sleep onset, causes repeated nighttime awakenings, reduces deep sleep, and creates a vicious cycle in which sleep deprivation further increases pain sensitivity.

Hospitalization itself contributes significantly to sleep disruption. Environmental noise, frequent nursing assessments, alarms, overnight medication administration, roommate disturbances, and unfamiliar surroundings reduce sleep duration and quality. Intensive care environments are particularly associated with severe circadian rhythm disruption.

Patient-related factors such as older age, female gender, obesity, smoking, alcohol use, physical inactivity, previous psychiatric illness, and pre-existing sleep disorders further increase the likelihood of sleep impairment during cancer treatment.

Consequences of Sleep Disturbances

Sleep disturbances have profound effects on both the physical and psychological health of patients undergoing cancer treatment. Persistent poor sleep contributes to cancer-

related fatigue, one of the most debilitating symptoms experienced during therapy. Fatigue reduces physical endurance, limits daily activities, decreases functional independence, and negatively affects patients' ability to tolerate chemotherapy, radiotherapy, and surgical recovery. Insufficient sleep also impairs cognitive function. Patients frequently report memory problems, reduced concentration, slower decision-making, and difficulty performing routine tasks. These cognitive changes, often referred to as "chemo brain," may be further aggravated by chronic sleep deprivation, affecting occupational performance, social interactions, and overall quality of life.

Psychological consequences are equally significant. Poor sleep is strongly associated with anxiety, depression, emotional distress, irritability, and reduced coping ability. Patients experiencing persistent insomnia often develop increased fear regarding disease progression and treatment outcomes, creating a cycle in which emotional distress further worsens sleep quality.

Sleep deprivation also influences immune and endocrine function. Disturbed sleep alters inflammatory pathways, immune regulation, and hormone secretion, potentially affecting wound healing, infection resistance, and recovery from cancer treatment. Although the relationship between sleep quality and cancer progression continues to be investigated, evidence suggests that maintaining healthy sleep supports overall physiological recovery.

From a healthcare perspective, unmanaged sleep disturbances increase hospital readmissions, prolong recovery periods, increase healthcare costs, and reduce treatment adherence. Patients experiencing poor sleep are more likely to miss appointments, discontinue treatment, or require additional supportive care interventions. Therefore, early recognition and management of sleep problems are essential components of comprehensive oncology care.

Assessment of Sleep Disturbances

Effective management begins with comprehensive assessment. Healthcare professionals should routinely evaluate sleep quality during every stage of cancer treatment rather than waiting for patients to report symptoms voluntarily. Many patients consider poor sleep to be an inevitable consequence of cancer and therefore do not discuss it unless specifically asked.

Assessment begins with obtaining a detailed sleep history, including bedtime routines, sleep duration, frequency of



nighttime awakenings, daytime sleepiness, medication use, caffeine intake, alcohol consumption, pain levels, emotional well-being, and environmental factors that may interfere with sleep. Identifying the onset, duration, and severity of sleep problems helps determine appropriate management strategies.

Several standardized assessment tools are available to evaluate sleep quality. The Pittsburgh Sleep Quality Index (PSQI) is widely used to assess overall sleep quality over the previous month. The Insomnia Severity Index (ISI) evaluates the severity and impact of insomnia symptoms, while the Epworth Sleepiness Scale (ESS) measures excessive daytime sleepiness. Sleep diaries are also valuable for recording bedtime, wake time, sleep interruptions, medication use, and daytime symptoms over several weeks. When clinically indicated, patients may be referred for specialized sleep investigations such as polysomnography or actigraphy. Polysomnography remains the gold standard for diagnosing obstructive sleep apnea, periodic limb movement disorder, and other complex sleep disorders. Actigraphy uses wearable devices to monitor sleep-wake patterns over extended periods and is particularly useful in outpatient oncology settings.

Comprehensive assessment should also include evaluation of pain, fatigue, anxiety, depression, medication side effects, nutritional status, and functional ability, as these factors frequently contribute to sleep disturbances.

Management of Sleep Disturbances

Successful management requires an individualized and multidisciplinary approach addressing both the underlying causes and the sleep disorder itself.

Pharmacological Management

Medications may be considered for patients experiencing moderate to severe insomnia that significantly affects daily functioning. Short-term use of hypnotic agents, melatonin receptor agonists, or certain antidepressants may improve sleep initiation and maintenance. However, prolonged use of sedative medications should be avoided because of the risk of dependence, tolerance, daytime drowsiness, falls, and cognitive impairment.

Pain management remains one of the most important components of improving sleep. Adequate analgesia, optimized medication scheduling, and effective control of treatment-related symptoms such as nausea, dyspnea, and

neuropathy frequently result in substantial improvement in sleep quality.

Medication regimens should be reviewed regularly to identify drugs that may contribute to insomnia. Corticosteroids, stimulants, and some targeted therapies may require dose adjustments or altered administration times to minimize sleep disruption.

Non-Pharmacological Management

Non-pharmacological interventions are recommended as first-line treatment for most patients because they are effective, safe, and associated with long-term benefits.

Cognitive Behavioral Therapy for Insomnia (CBT-I) is considered the most effective evidence-based intervention for chronic insomnia. CBT-I combines sleep education, stimulus control, sleep restriction therapy, relaxation techniques, and cognitive restructuring to improve sleep habits and reduce anxiety associated with sleep.

Sleep hygiene education is another essential intervention. Patients should be encouraged to maintain regular sleep schedules, avoid caffeine and nicotine before bedtime, limit daytime naps, create a quiet and comfortable sleep environment, reduce evening screen time, and establish relaxing bedtime routines.

Regular physical activity has demonstrated significant benefits in improving sleep quality, reducing fatigue, and enhancing psychological well-being. Exercise programs should be individualized according to the patient's health status and treatment stage.

Mindfulness meditation, yoga, breathing exercises, progressive muscle relaxation, guided imagery, music therapy, and acupuncture have also shown positive effects on sleep quality among cancer patients. These interventions reduce stress, improve emotional well-being, and promote relaxation without medication-related adverse effects.

Psychological counseling and support groups provide opportunities for patients to discuss fears, anxiety, depression, and emotional concerns that frequently contribute to insomnia. Family involvement and caregiver education further strengthen supportive care.

Role of Oncology Nurses

Oncology nurses play a pivotal role in preventing, identifying, and managing sleep disturbances throughout the cancer care continuum. Their continuous interaction with patients allows early recognition of sleep problems that may otherwise remain unnoticed.



Routine assessment of sleep quality should become an integral component of nursing care. Nurses should evaluate sleep duration, nighttime awakenings, daytime fatigue, medication use, pain, emotional status, and environmental factors during each patient encounter. Early identification enables timely referral and intervention before sleep problems become chronic.

Patient education is one of the most important nursing responsibilities. Nurses teach patients about healthy sleep habits, medication adherence, relaxation techniques, physical activity, and strategies for managing treatment-related symptoms that interfere with sleep. Education empowers patients to actively participate in improving their own sleep quality.

Nurses also coordinate multidisciplinary care by collaborating with oncologists, psychologists, physiotherapists, pain specialists, dietitians, and sleep medicine specialists. Such collaboration ensures comprehensive management addressing both physical and psychological contributors to sleep disturbance.

Emotional support provided by oncology nurses helps reduce anxiety and promotes coping during cancer treatment. Therapeutic communication, reassurance, active listening, and family education contribute significantly to improving psychological well-being and sleep quality.

Additionally, oncology nurses advocate for environmental modifications within healthcare settings by minimizing nighttime noise, reducing unnecessary interruptions, adjusting lighting, and promoting restful hospital environments whenever possible.

Challenges and Future Perspectives

Despite increasing awareness, sleep disturbances remain underdiagnosed in oncology practice. Time constraints, limited routine screening, inadequate professional training, and insufficient access to sleep specialists often delay diagnosis and treatment. Many healthcare settings continue to prioritize physical symptoms while overlooking sleep health.

Future research should focus on developing standardized sleep assessment protocols, integrating digital health technologies for remote monitoring, and evaluating personalized interventions for different cancer populations. Wearable sleep-monitoring devices, mobile health applications, and telehealth services offer promising

opportunities for continuous assessment and early intervention.

Further studies are also needed to understand the biological relationship between sleep, immune function, inflammation, and cancer progression. Incorporating sleep management into routine oncology guidelines may improve both patient outcomes and quality of life.

Conclusion

Sleep disturbances are among the most prevalent and burdensome symptoms experienced by patients receiving cancer treatment. They arise from a complex interaction of disease-related, treatment-related, psychological, and environmental factors and significantly affect physical functioning, emotional health, cognitive performance, treatment adherence, and overall quality of life.

Early identification and comprehensive assessment are essential for effective management. Evidence supports a multidisciplinary approach combining pharmacological therapy when necessary with non-pharmacological interventions such as cognitive behavioral therapy, sleep hygiene education, physical activity, relaxation techniques, and psychosocial support.

Oncology nurses remain central to improving sleep health through routine assessment, patient education, emotional support, coordination of multidisciplinary care, and advocacy for evidence-based sleep management practices. As cancer care continues to evolve, integrating sleep assessment into routine clinical practice will contribute to more holistic, patient-centered oncology care and ultimately enhance treatment outcomes and quality of life for individuals living with cancer.

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