Sleep and Cancer

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Sleep disturbances are reported in up to 60% of patients with cancers of many types and stages [1–4]. Impaired sleep has an array of detrimental effects on the health of individuals with cancer and their family caregivers [5–7], with significant societal costs [8]. Cancer-related sleep disturbances can also affect health-related quality of life by way of persistent fatigue [9–11] and altered mood [12, 13]. Chronic sleep loss may lead to poor adherence to cancer treatments [14] and higher morbidity and mortality [15]. Sleep disturbances can range from perceived or actual alterations in usual sleep patterns to diagnosed sleep disorders meeting precise diagnostic criteria [16, 17]. New onset or worsening of sleep disturbances are common and disabling problems for those with cancer before treatment, during treatments such as chemotherapy and radiation therapy, and after completion of treatments [4, 18, 19]. Cancer pathology, treatments, and symptoms such as pain and hot flashes, disruption of daily activity and circadian rhythms, and unhealthy sleep habits contribute to acute and chronic sleep disturbances [19–21]. In this chapter, we describe the prevalence of common sleep problems in adults with cancer and define key terms. This chapter also provides information about biological and behavioral conceptual models of sleep and guidelines for the assessment and management of sleep disturbances. Emphasis is given to the latest non-pharmacological evidence-based treatments. We discuss the importance of provider awareness of sleep problems and patient education. Finally, we identify barriers to behavioral change and strategies to assist the cancer patient and family to self-manage sleep problems.

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Introduction and Significance

The psychological impact of cancer, time-consuming treatments, and range of distressing symptoms are known to disrupt sleep patterns and sleep quality in cancer patients and posttreatment survivors. Yet, the true prevalence of sleep disturbance in cancer populations is not well established, in part because of the underreporting of sleep problems by patients and providers. Also, most studies of sleep in adults with cancer use cross-sectional designs, convenience sampling, and a variety of definitions and measures. Despite

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these methodological issues, evidence suggests approximately 30–60% of adults with cancer experience insomnia or other sleep disorders at some time during diagnosis, treatment, and long after primary treatment has ended [21, 22]. To put these rates into context, sleep disturbance affects 10–15% of the general public, and only 6–13% experience "insomnia syndrome" characterized as persistent insomnia at least 3 nights per week [23–25]. Advances in treatment and improved survival rates have resulted in greater numbers of cancer survivors [26] who require ongoing treatment of late and long-term effects of cancer. Sleep disturbance is a recurrent long-term effect of cancer. It is one of the top concerns of cancer survivors with significant effects on quality of life and functioning [10, 27, 28].

Across the cancer trajectory, consequences of poor sleep include lower quality of life [9, 19] and physical and cognitive function [29]. Several studies have reported links between sleep disturbances and other symptoms, including mood disturbances [12, 13], pain [30], hot flashes [31, 32], and persistent cancer-related fatigue [9–11]. These associations may be bidirectional. For example, cancer-related pain may cause a delay in falling asleep, frequent awakenings, and poor sleep quality [10, 33, 34]. In turn, a poor night's sleep can lead to increased pain intensity and decreased ability to control pain the next day. Other studies have reported that impaired sleep can result in diminished immune responses [35, 36], increased risk of infection [37], and poor adherence to cancer treatments [14].

Despite its frequency and negative impact, sleep disturbances remain underreported, underdiagnosed, and inadequately treated [38]. Some cancer survivors and healthcare providers may believe that sleep disturbances are normal and a temporary response to cancer and its treatment. Other cancer-related symptoms and concerns about survival appear to take priority over sleep assessment and management [38]. Although reported to be one of the most bothersome issues to patients with cancer, disturbed sleep often is not one of the symptoms and treatment side effects discussed with healthcare providers [39]. Even in palliative care settings where symptom management is a primary objective, evidence suggests few patients report sleep problems to healthcare providers [40]. Yet, frequent use of hypnotics has been documented in large samples of cancer patients [41], suggesting the actual extent of sleep problems is underappreciated. Even when patients in ambulatory oncology clinics do report sleep problems, clinicians may prescribe effective pharmacological and non-pharmacological treatments only half the time [38].

Definitions

Sleep is an active, biobehavioral process defined as a state of temporary perceptual disengagement from and unresponsiveness to the environment [42]. The function of sleep is to conserve energy, maintain homeostasis and immune functioning, and restore physiological processes that degrade during wakefulness [43]. Thus, sleep disturbances compromise the restorative functions of sleep. Because sleep disturbances take many forms, definitions and terms for sleep disturbances often are used inconsistently. The terms sleep disorders, sleep disturbances (also referred to as sleep-wake disturbances), and insomnia are often used interchangeably. Yet, there are essential distinctions among these terms.

Sleep disorders comprise the nearly 100 diagnostic entities identified by criteria in the International Classification of Sleep Disorders, 3rd edition (ICSD-3) [16], and the *Diagnostic and Statistical Manual of Mental Disorders*, 5th edition (DSM-5) [17]. The most common sleep disorders in primary care and oncology populations include chronic insomnia, sleep-disordered breathing (e.g., obstructive sleep apnea), movement disorders (e.g., restless legs syndrome), and circadian rhythm disorders [44].

Sleep disturbances are the perceived or actual alterations in nighttime sleep (quantity and quality), with subsequent daytime impairment, in the absence of a diagnostic label [45]. Sleep disturbances occur at any time during the cancer trajectory and present with various features. Oncology literature focuses primarily on sleep

disturbance in terms of the usual symptoms of insomnia such as difficulty falling asleep (sleep initiation), staying asleep (sleep maintenance), and not feeling restored or refreshed on awakening.

Insomnia is defined by the ICSD-3 [16] as the persistent difficulty with sleep initiation, maintenance, duration, or quality accompanied by some form of daytime impairment, which occurs despite adequate opportunity for sleep. Additional terms for subcategories of insomnia by duration and severity are used frequently in oncology and sleep publications. For example, *chronic insomnia disorder* is the presence of insomnia for at least 3 months, as described in the ICSD-3 [16]. *Insomnia syndrome* was created to differentiate between mild insomnia symptoms and more severe clinical insomnia by applying established insomnia algorithms to a large population-based sample [46]. Insomnia syndrome refers to the subjective complaint of sleep difficulties, a sleep-onset latency >30 min, ≥3 nights per week, duration of ≥1 month, associated with impaired daytime functioning or marked distress, or the use of hypnotic medication for at least three nights per week [46]. *Hypersomnia*, a common cancer-related disorder, refers to a group of sleep disorders in which the main complaint is daytime sleepiness that is not caused by disturbed nocturnal sleep or misaligned circadian rhythms [16].

To more effectively assess and diagnose sleep problems such as insomnia, basic sleep parameter terminology was developed [47]. The following sleep parameter terms are used in both research and clinical settings. Sleep latency (SL) refers to the number of minutes it takes to fall asleep after turning out the lights and intending to sleep. Total sleep time (TST) is the number of minutes of actual sleep during a usual sleep period. Sleep efficiency (SE) is the ratio of time in bed to actual sleep time, expressed as a percentage. Wakefulness after sleep onset (WASO) is the number of minutes awake during the main sleep period. Good sleepers are characterized as having SL < 30 min, SE of >85%, nocturnal awakenings totaling <30 min of WASO [47], and TST of at least 7 h [48].

Underlying Mechanisms

The causes and risk factors for cancer-related sleep disturbances are extensive and may be superimposed on precancer sleep issues [49]. Tumor pathology, advanced stage of cancer, treatments, medications, environmental factors, psychosocial disturbances, and other comorbid medical conditions increase the risk of sleep disturbances. These risk factors have been categorized as predisposing, precipitating, and perpetuating factors [17, 50–52] as described in Spielman's "3 P" model of insomnia [53]. This model illustrates three categories of biological and behavioral factors underlying sleep disturbance [53]. *Predisposing factors* are enduring psychological or biological traits that increase the likelihood of developing sleep problems during the cancer experience. Predisposing factors include advanced age, female gender, anxiety-prone personality, family or personal history of insomnia and/or psychiatric disorder, and genetic factors [2].

Precipitating factors are life events and medical, psychological, and environmental factors that trigger insomnia. Examples in people living with cancer include cancer treatments and side effects that disrupt circadian rhythms, hospitalization, and emotional distress [54]. Side effects such as respiratory conditions, gastrointestinal complications (e.g., diarrhea, nausea), and genitourinary problems (e.g., incontinence, retention) can negatively impact sleep [55]. Estrogen deficiency induced by chemotherapy and hormone therapy can trigger or exacerbate nighttime menopausal symptoms [56]. Cancer-related pain may delay sleep onset or cause frequent awakenings and poor sleep quality [10, 33, 34]. Hospitalization or changes in cancer patients' usual sleeping environment may precipitate sleep disturbances. Family problems and financial and occupational stressors may emerge as additional precipitating factors [34].

Perpetuating factors are maladaptive behaviors and beliefs used to cope with sleep difficulties [53]. Behaviors that perpetuate sleep disturbances include extending time in bed, frequent and long naps, irregular sleep schedule, and

physical inactivity [55]. Beliefs such as fear of sleeplessness and excessive worries about daytime consequences of poor sleep may delay sleep onset and cause frequent, prolonged awakenings.

Another relevant model is the two-process model of sleep-wake regulation that posits that the sleep-wake cycle is regulated by two biological mechanisms: circadian rhythm and sleep-wake homeostasis [57]. An internal circadian clock in the hypothalamus regulates the timing of sleep and alertness levels. Sleep-wake homeostasis involves the accumulation of sleep-inducing substances in the brain, which generates the homeostatic sleep drive. Internal and external circadian factors (e.g., light exposure) interact with homeostatic components to regulate the nearly 24-h sleep-wake rhythm [57]. Healthy rhythms occur when there is synchrony of timing between the circadian and homeostatic processes. Cancer and its treatment interfere with both processes through changes in usual sleep behaviors, environment changes, and altered hypothalamic-pituitary-adrenal axis regulation [50].

Assessment

Screening Guidelines

There is expert consensus advocating, at minimum, a brief and focused screening and assessment for sleep disturbances in cancer patients and survivors [58–61]. With growing evidence from high-quality studies, leading organizations such as the National Comprehensive Cancer Network (NCCN) [58] and the Oncology Nursing Society (ONS) [59] have developed guidelines for screening, assessment, and/or interventions for cancer-related sleep disturbances in adult cancer populations. Similarly, an interdisciplinary expert panel from Canada developed the Pan-Canadian practice guideline for the prevention, screening, assessment, and treatment of sleep disturbances in adults with cancer based on available evidence [60]. The first step in these guidelines is an initial screening by healthcare providers using standardized tools or a few brief questions, at regular intervals and when there is a change in clinical status or treatment. The NCCN Guidelines include the following screening questions: (1) Are you having problems falling asleep or staying asleep? (2) Are you experiencing excessive sleepiness? (3) Have you been told that you snore frequently or stop breathing during sleep [58]? If the screening is positive, the next step is additional assessment of the nature of the sleep disturbance, contributing factors, and daytime consequences.

Assessment

A health history, including sleep disorders and medical, surgical, and psychiatric conditions, provides key information about factors that may be associated with impaired sleep [58]. Common side effects of cancer or its treatment that can precipitate insomnia, such as altered mood, pain, or fatigue, also should be assessed [62]. Self-report questionnaires provide essential patient perspectives. For example, brief tools with established validity in cancer populations [63] such as the Insomnia Severity Index (ISI) [64] evaluate insomnia. The Epworth Sleepiness Scale (ESS) [65] evaluates excessive daytime sleepiness, a symptom of obstructive sleep apnea (OSA) and other sleep disorders. Sleep diaries are often used to identify circadian rhythm disorders and contributing factors in insomnia development [66]. The Pittsburgh Sleep Quality Index (PSQI) [67] is a well-established but lengthy measure of sleep characteristics and history in the past month. The scope of sleep assessments may vary according to the setting, health status, and developmental stage of the patients with cancer. Minimally, sleep-related questions could be incorporated into the health history and review of medication.

Focused Workup

For patients experiencing moderate to severe levels of sleep disturbance, further assessment of the underlying causes is indicated. Physical exams provide needed data about cancer-related or medical factors contributing to sleep problems

such as anatomical alterations. The NCCN Survivorship Guidelines include recommendations for assessment and management of sleep disorders [58]. Recommendations for a focused workup include a more in-depth general medical, sleep, and cancer history and medication review. A thorough physical examination may uncover potential sleep disorders. Referrals for specialized sleep assessment such as polysomnography and actigraphy may be indicated when specific sleep disorders are suspected. Early identification of sleep disorders such as OSA or restless legs syndrome (RLS; also referred to as Willis-Ekbom disease) allows for timely referral to a sleep specialist for diagnostic studies and treatment as indicated [58].

Barriers

Despite the prevalence of cancer-related sleep disorders and the availability of guidelines, assessment is not routinely performed in many institutions and oncology practice settings [68]. Numerous patient-, provider-, and system-related barriers hinder the translation of these guidelines into practice settings [68]. There are comparable barriers to the implementation of evidence-based fatigue guidelines [69]. These challenges include patient's attitudes and beliefs, clinician's lack of knowledge and ability to provide relatively complex interventions, and the lack of access to reimbursement and resources (e.g., sleep experts for referrals) on a systems level [69].

Non-pharmacologic and Pharmacological Treatments

This section focuses on treatments to prevent and manage sleep disturbances in patients with cancer. The selected treatments reflect the strongest evidence-based interventions for patients who screened positive for sleep disturbances (see the section "Screening Guidelines") but have not been diagnosed or treated for insomnia by a clinician. These patients also were screened and tested negative for the other most common sleep disorders [OSA, movement disorders (e.g., RLS), and circadian rhythm disorders].

First, all cancer patients and survivors need to receive education on how to prevent sleep disturbances, especially during stressful periods. The importance of both the quality and quantity of sleep needs to be emphasized. Patients need to be taught how to recognize sleep problems and when to discuss sleep issues with clinicians. The NCI supports a Physician Data Query (PDQ®) website that summarizes general information about sleep disorders for patients. This website provides up-to-date information about its causes, assessment, and treatment. However, the NCI PDQ website does not provide formal guidelines for making decisions about healthcare [70]. A preventive-supportive education intervention for all patients with cancer is also available for use [60].

Management of sleep disturbances varies based on several factors. A good place to start is to examine the patient's severity score on the Insomnia Severity Index [63]. Current functional status also needs to be assessed before selecting a treatment. A combined approach is needed that targets any contributing factor (hot flashes, pain, nocturia) and the altered beliefs that may be maintaining maladaptive sleep behaviors [60]. All patients need to engage in developing an individualized plan based on the severity of sleep disturbances, functional status, accompanying symptoms, altered beliefs, and treatment acceptability [47].

Non-pharmacologic Treatments

Over the last 15 years, growing evidence suggests that patients with cancer who experience sleep disturbances can benefit from treatments that were originally developed and tested in patients without cancer who had chronic insomnia [71, 72]. Table 4.1 provides key information about components of non-pharmacologic interventions. The evidence is reviewed annually by ONS putting evidence into practice (PEP) program. After detailed review and analyses of published studies, the ONS-PEP team rates interventions in one of several categories: (1)

Table 4.1 Non-pharmacologic interventions for sleep disturbances in cancer patients [47, 74, 75]

1.0	**Cognitive behavioral interventions/approach**
1.1	*Deliver **cognitive therapy** to alter dysfunctional beliefs* about sleep
1.2	Determine altered dysfunctional beliefs and attitudes about sleep
1.3	Help patients develop realistic sleep expectations
2.0	Instruct patients in the following ***stimulus control techniques***
2.1	Go to bed only when sleepy and at about the same time each night
2.2	Get out of bed and go to another room whenever unable to fall asleep within 20–30 min, return to bed only when sleepy again; repeat as often as needed throughout the night
2.3	Use the bedroom for sleep and sex only
3.0	Instruct patients in the following ***sleep restriction techniques***
3.1	Maintain a regular bedtime and rising time each day
3.2	Avoid daytime napping; if needed, limit to 1 h or less early to midday; avoid unnecessary time in bed during the day
4.0	Instruct patients in the following ***relaxation techniques***
4.1	Use a relaxation technique within 2 h before going to bed
4.2	Schedule a "clear your head time" 90 min before going to bed
5.0	Instruct patients in the following ***sleep hygiene techniques***
5.1	Avoid caffeine, nicotine, and other stimulants after noon; finish dinner 3 h before bedtime; do not go to bed hungry
5.2	Create a bedtime routine. Keep the bedroom dark, cool, and quiet; avoid pets in bedroom
5.3	Do not watch television or use computers or tablets in the bedroom
5.4	Replace mattress every 10–12 years, pillows more frequently; use light sleepwear and covers
5.5	Ensure at least 20 min of daily exposure to bright, natural light soon after awakening
6.0	**Exercise**
6.1	Rule out bone metastasis or exercise contraindications
6.2	Have patient complete moderate exercise (e.g., brisk walking 30 min four to five times per week) at least 3 h before bedtime
6.3	Encourage patients to perform strength and resistance training
7.0	**Complementary therapies**
7.1	Encourage patients to decrease stress by selecting a relaxation technique that suit him/her
7.2	Encourage patients to decrease stress by focusing on and isolating various muscle groups while moving progressively up and down the body
7.3	Encourage focused breathing, with all attention centered on the sensations of breathing, including the rhythm and rise and fall of the chest
8.0	**Education**
8.1	Provide patients with information regarding specifics of treatment and expected side effects, including sleep disturbances
8.2	Provide anticipatory education to patients about healthy sleep techniques
8.3	Repeat this information throughout the treatment
8.4	Ensure that the patient's sleep expectations are realistic

recommended for practice, (2) likely to be effective, (3) effectiveness not established, (4) benefits balanced with harms, (5) not beneficial, and (6) expert opinion [59]. The NCCN Survivorship Guidelines section on sleep disorders also contains valuable information and is updated annually. All recommendations by NCCN are category 2A unless otherwise specified; they are based on lower-level evidence and there is uniform consensus that the intervention is appropriate [73].

Cognitive Behavioral Therapy-Insomnia (CBTI)

CBTI is the only intervention *Recommended for Practice* by ONS-PEP. CBTI is a type of psychotherapy that assists patients in making changes in thoughts and behaviors. The goal of this treatment is to explore and understand a person's thoughts and beliefs related to sleep and to select new, healthier approaches to thinking, coping, and sleep behaviors [47, 74, 75]. There are a

variety of strategies, with the highest evidence for chronic insomnia being the components of CBTI, sleep restriction, stimulus control, and relaxation [76]. Another strategy, known as sleep hygiene, is essential in preventing insomnia and has been shown to work in association with the others, but does not have evidence to be an effective, independent strategy. These strategies are designed to reduce the hyperarousal response and the perpetuating factors described in the section "Underlying Mechanisms." Despite the high level of evidence for CBTI's effect, a limitation is that the majority of studies have been conducted in women with breast cancer and evidence of effect in other cancer diagnoses is needed. Studies can be viewed by clicking on CBTI on the ONS website. Another limitation is that the majority of the trials' inclusion criteria in cancer patients did not require a cutoff score to indicate the presence of moderate to severe insomnia. Cognitive behavioral therapy is a recommended treatment for insomnia disorder in patients with cancer. CBTI may be particularly helpful in patients with irregular sleep patterns and a history of poor sleep habits. CBTI is ready for dissemination in oncology clinical practice.

Mindfulness-Based Stress Reduction (MBSR)

The ONS-PEP category labeled *Likely to be Effective* currently includes two treatments: mindfulness-based stress reduction (MBSR) and exercise [59]. The NCCN Guidelines do not include either of these interventions [73]. Similar to CBTI, the majority of evidence for MBSR in cancer has come from patients with early-stage breast cancer. MBSR is a program that helps a person learn to calm his/her mind and body to help cope with illness, pain, and stress. The goal of MBSR is to deal with experiences through awareness of feelings, thoughts, and body sensations in the present moment using techniques such as body scan and exercises for yoga and meditation [77]. Results of several large, randomized controlled trials led ONS-PEP reviewers to conclude that MBSR is effective in improving sleep disturbances in patients with cancer [59]. However, programs have been inconsistent, conducted using a variety of components, both in a clinic and at home, and in different doses. This intervention may be particularly helpful in patients with anxiety. More evidence from large, rigorously designed studies with patients with different types and stages of cancer are needed.

Exercise

Exercise is defined by ONS-PEP as a physical activity that involves bodily movement performed to improve or preserve physical fitness that includes one or more of the following components: cardiorespiratory endurance (aerobic fitness), muscular strength, muscular endurance, flexibility, and body composition [59]. A variety of physical activities are included, with all of them characterized by frequency, intensity, time, and type (FITT) [78]. Exercise has been shown to improve sleep in patients both during and following cancer treatments [79] including recent positive benefits in patients with lung cancer [80] . Guidelines for cancer patients with normal functional status are similar to healthy populations; the exercise prescription is for 30 min/day 5 days a week, for a total of 150 min/week [81]. Exercise/physical activity interventions of moderate intensity have been effective in producing short-term behavior changes in physical activity, with highly structured interventions resulting in larger behavior change effects overall [82]. When a patient's health status is lower than normal, the FITT schedule can be modified by an exercise trainer for cancer patients in order to maintain current function and prevent further decrease in strength and health status. Aerobic exercise also has been reported to maintain and/or improve mental and emotional health in stressful times. Exercise also may assist in strengthening 24-h circadian activity rhythms, a factor associated with longer survival in patients with advanced cancer [83].

The ONS-PEP category of *Effectiveness Not Established* includes several additional behavioral interventions. Although some positive

results have been reported, these interventions need further testing in rigorously designed research studies and should not be given higher priority when discussing interventions with patients. The point to emphasize is that clinicians should only recommend strategies that have been given the "green light" for practice, as displayed at the ONS-PEP website [59] and the NCCN website [73].

Pharmacological Treatments/ Interventions

Pharmacological treatments are rated by ONS-PEP as "Benefits Balanced with Harms" [59]. NCCN includes a pharmacologic treatment intervention, if safe, for difficulty falling asleep and difficulty maintaining sleep. NCCN provides a detailed table of principles for choosing a FDA-approved hypnotic [73]. Prescription and over-the-counter agents may be beneficial as short-term strategies and are suggested to accompany the behavioral strategies listed in Table 4.1 that take more time to show benefits. There have not been any studies specifically exploring the benefits versus harms of hypnotic agents in patients with cancer.

When patients with cancer approach a clinician requesting sleep medications, providers need to explain the potential risks to patients. The decision to use pharmacological agents needs to be made carefully by the clinician, patient, and caregiver in full awareness of potential side effects. Drug-drug interactions need to be considered but most interactions with chemotherapy agents are not known. Concerns have been raised about potential interactions between tamoxifen and certain antidepressants [44]. Safety issues also need to be considered and include potential for tolerance, dependence, and withdrawal.

The preferred classification of prescription drugs that may be used short-term for patients with sleep disturbances is benzodiazepine hypnotics, benzodiazepine-receptor agonists [61]. Daytime effects of hypnotics and sedatives include a "hangover" effect upon awakening and during the morning, resulting in effects on memory and performance, leading to reduced, rather than improved, daytime functioning. These effects are less likely with agents with a short half-life. This effect also may occur when over-the-counter sleep aids are used that contain antihistamines in addition to acetaminophen. Sleep experts recommend starting medications at a low dose, monitoring closely for side effects, and tapering slowly to prevent withdrawal symptoms [84]. Patients should be encouraged to discuss the use of any herbal sleep aids with their healthcare provider. Herbal agents are strongly discouraged during chemotherapy as there have been no studies that examined drug-drug interactions. Clinicians are advised to carefully weigh the benefits versus the harmful effects of medications for sleep disturbances and to use an individualized approach [59].

Implications for Management of Sleep-Wake Disturbances

Patient and Family Self-Management

The success of any behavioral program relies upon one's ability to adapt and stick with a new behavior. It is reasonable to say that behavior change has become integral to the future of population health and, certainly, to preventive medicine. The problem is that behavior change has been relatively elusive to most of us. It seems intuitive, but it is not. It is difficult. It is transient. It is often emotional. The good news is that the field of psychology has studied behavior change for many decades, and there are some useful insights from practice and research on how to support behavior change. These techniques work when applied to sleep behaviors; for a review, see [75]. Perhaps the first thing to realize is that there will always be barriers to change. Barriers should not be ignored. Trying to eliminate them, however, can be a daunting task, as new barriers to change will arise once old ones are eliminated. We all know some patients who manage change despite barriers, while others are unable to maintain changes if barriers are not removed. Knowing this, we can focus on the broad aspects of

behavior change that exist regardless of the specific behavior(s) being targeted. The literature is filled with models that support behavior change; we present some of the most relevant components of change here, referencing models where appropriate.

Provider Awareness

One thing to consider regarding behavior change is to support the autonomy of the patient in making a change. Motivational interviewing is a strong proponent of supporting the patient's autonomy to change [85]. Clinicians often see it as their role to create desired change(s) in our patients, but forcing change rarely works. Clinicians need to see their role as facilitators of change and encourage family members to see themselves in a similar role. By pushing for change, we sometimes create a dynamic where the patient plays devil's advocate against change. It is better instead to gauge the patient's desire to change and use her/his own internal motivation to create lasting change.

One technique used in motivational interviewing to accomplish this is scaling. One example of scaling would be to ask the patient, "On a scale of 1–10, how motivated are you to (create the specific change requested)?" The follow-up questions are critical. The first follow-up question pulls for the barriers to change. The question is, "Why is your rating not higher?" The patient's answers should be acknowledged with empathy and an understanding that barriers exist to change and will need to be managed. The next question is even more useful. You ask, "Why is your rating not lower?" The answer to this question reflects that person's own motivations to change, in her/his own words. We often assume that a person's motivation for change is similar to our motivations for them, when, in fact, it may be different. When possible, reflect back their statements using their own words, to increase the personal aspect of the facilitators to change. These facilitators provide a useful mechanism to enhance change when the patient is struggling through the process of change.

Confidence, or self-efficacy [86], is perhaps the greatest predictor of success in behavior change. Self-efficacy refers to one's confidence that she/he can stick with change when it is difficult. Building confidence, then, is one of the greatest challenges around change. Confidence can be built in a number of ways. Proper goal setting can make targets very reachable, resulting in quick successes toward change and, therefore, building confidence. For example, achieving 10,000 steps per day can be a very reasonable goal for someone who is already achieving 8500 steps, but it may decrease motivation if it is set as a goal for someone who is achieving only 4000 steps. Reached goals can then result in setting a new, slightly higher, goal allowing clinicians to shape patients toward a long-term target. There is evidence that having both long-term and short-term goals is beneficial in helping to create lasting change [87].

Social support is another significant enabler in creating change [88]. Social support can take numerous forms, but it should be encouraged in family members and friends, broadly. It is best if the patient tells her/his social network what type of support helps her/him best. This provides the social network some guidelines under which to operate. The proper social support can go a long way. This has been demonstrated among specific cancer populations in notable ways. One thing to remember, however, is that social support can lead to poor behaviors as well, especially where sleep is concerned. If one or more people in the group express the feeling that more rest is what is needed when sleep is disturbed, it can lead to more people exhibiting maladaptive sleep behaviors. Therefore, the proper information should be provided to the group, and the role of the network should be to support efforts toward productive sleep behaviors. Proper sleep behaviors are not always intuitive to patients or their social networks.

Our job is to educate to a receptive patient, provide emotional support, and set the stage for effective change. The change must come, however, from the patient herself/himself and from the network upon which they receive most of their support. We can facilitate that by adhering

to some of the fundamental aspects of behavior change outlined above. We rarely have to teach cancer patients that sleep is necessary, but we do need to educate that "trying" to sleep too much or "resting" too much can lead to more maladaptive sleep behaviors. Sleep should be scheduled and valued, but so should the other behaviors highlighted in the intervention section, such as stress management and exercise.

Summary and Future Directions

This chapter emphasizes the significance of the problem of sleep disturbances in those with cancer. We stressed the critical need to improve screening and further assessment using valid and reliable measurements/tools both during cancer treatment and in survivorship. Insomnia is the most prevalent sleep disorder in patients with cancer, but OSA, movement disorders, and circadian rhythm disorders need to be ruled out before initiating interventions for insomnia. Three types of non-pharmacologic interventions that have had their effectiveness established were presented (CBTI, MBSR, and exercise/physical activity) and are ready for dissemination and adoption in clinical settings. Clinicians need to routinely assess and treat other symptoms that cluster with sleep disturbances such as pain, anxiety, and nausea. Pharmacologic agents are recommended for short-term use only, and patients need to be made aware of both the potential benefits and risks before recommending any remedies for sleep. The role of the healthcare team is to increase the patient's awareness and education about sleep, and resources for patients and professionals were shared. Advice was provided on how clinicians can assist patients and their families/support network in making the behavior changes to improve management of sleep disturbances. Strategies to enhance behaviors to promote sleep include educating about behaviors for healthy sleep, identifying and decreasing barriers, motivational interviewing to promote autonomy to change, building confidence/self-efficacy for maintaining changes, and using positive social support to maintain adaptive sleep behaviors.

Future directions include dissemination and adoption of strategies to manage sleep disturbances in patients with cancer in community settings. The current situation is minimal awareness and assessment of sleep disturbances in oncology patients and settings. Resources for cancer patients experiencing sleep disturbances are inadequate to meet the needs. We need to develop resources that can be accessed by vulnerable populations such as older adults and those living in rural and medically underserved areas. Self-management strategies need to be accessible via technology and will become more prevalent and offer individualization.

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