

CASE STUDIES  
in Lifestyle  
Medicine

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# Cognitive-Behavioral Therapy for Insomnia: An Effective and Underutilized Treatment for Insomnia

**Abstract:** Sleep difficulties are an extremely prevalent health problem, with about 33% to 50% of adults reporting regular difficulty falling asleep or staying asleep. About 7% to 18% of adults meet the criteria for an insomnia disorder.<sup>1,2</sup> Sleep disruptions contribute to a variety of medical problems, including cognitive impairment, reduced immune function, metabolic imbalance, and exacerbation of psychiatric conditions.<sup>3</sup> The most effective nonpharmacological treatment for chronic insomnia is cognitive-behavioral therapy for insomnia (CBT-i). CBT-i produces results that are equivalent to sleep medication, with no side effects, fewer episodes of relapse, and a tendency for sleep to continue to improve long past the end of treatment. The long-term improvements seem to result from the patient learning how to support and promote the body's natural sleep mechanism. The five key components of CBT-i are sleep consolidation, stimulus control, cognitive restructuring, sleep hygiene, and relaxation techniques. Although CBT-i is a safe and highly effective treatment for insomnia, unfortunately, it is

underutilized, primarily because of two reasons: (1) There is currently a shortage of trained CBT-i practitioners. (2) Patient are much more likely to learn about sleep medication as a treatment for their insomnia (via drug advertisements and prescribing physicians) than CBT-i. Physicians and health care providers can play an important role in educating their patients about CBT-i and recommending it as a first-line treatment for chronic insomnia.

**Keywords:** insomnia, cognitive-behavioral therapy for insomnia

Sleep difficulties are an extremely prevalent health problem, with about 33% to 50% of adults reporting regular difficulty falling asleep or staying asleep. About 7% to 18% of adults meet the criteria for an insomnia disorder.<sup>1,2</sup> Sleep disruptions contribute to a variety of medical problems, including cognitive impairment, reduced immune function, metabolic imbalance, and exacerbation of psychiatric conditions.<sup>3</sup>

Although sleep medication can be an effective short-term treatment for insomnia, some patients experience side effects such as amnesic episodes, cognitive impairment, and morning hangover. In addition, some patients continue to experience sleep disturbance even when they are taking these medications, leading to higher doses and eventual dependence on and tolerance to the drugs.<sup>4</sup>

The most effective nonpharmacological treatment for chronic insomnia is cognitive-behavioral therapy for insomnia (CBT-i). A 2015 meta-analysis of 20 randomized controlled studies of CBT-i for patients with chronic insomnia found average reductions of 19 minutes in sleep latency and 26 minutes in time awake after sleep onset. Total sleep time improved by 8 minutes, and sleep efficiency improved by 10%.<sup>5</sup>

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sleep mechanism. Whereas sleeping pills mask the symptoms of insomnia, CBT-i promotes a genuine learning process that restores the body's natural sleep mechanism. The patient learns skills to decrease the conditioned arousal that contributes to insomnia and engages in lifestyle practices that cooperate with the body's natural circadian rhythm.

JL is a 26-year-old single woman who presented with insomnia she had suffered from for the past 10 years. She related that her father and his parents also suffered from insomnia. Extremely bright and hardworking, she graduated at the top of her class from an elite university and was a nationally recognized athlete. Her first job after graduation involved analyzing safety risks. The stakes were high, and she found the work extremely stressful. It demanded a high degree of concentration for extended periods. In addition to her job, JL was feeling stressed about relationships, family expectations, and the death of a close friend. She was attempting to cope through exercise, prayer, daily meditation, talking with friends, drinking alcohol, watching TV, and taking hot baths. Despite these efforts, she felt increasingly anxious. Her insomnia had recently become more severe, and she could be awake for days on end. She related that she needed 9 hours of sleep a night, and when she did manage to sleep, she was only sleeping 4 to 7 hours, even with sleep medication.

Blessed with a lively intellect and robust energy, JL tended to face challenges head on with active problem solving. Unfortunately, she had trouble turning off her natural tendency at night. When she got into bed at night, her mind raced, and it typically took hours to get to sleep.

When she presented for treatment, her goal was to improve her sleep and wean herself from the lorazepam, zolpidem, and zaleplon she was taking every night. (She was also taking citalopram, which she planned to continue taking.) She needed to be sharp and alert at her job, and she was concerned that her insomnia and the potential side effects of her sleep medications could impair her cognitive abilities. She was highly motivated and had the mindset to work diligently to achieve her goals.

At the conclusion of my evaluation, I suggested to JL that she could improve her sleep and eliminate her sleep medications through CBT-i. She was enthusiastic about implementing CBT-i. Its systematic step-by-step framework appealed to her analytical intellect and work ethic. I told her CBT-i would neither be a quick fix nor a magic pill but that it would likely improve her sleep substantially and she would learn sleep-enhancing skills she could use for the rest of her life.

The 5 primary components of CBT-i are discussed below.

### Sleep Consolidation (Also Known as Sleep Restriction)

Many insomniacs spend hours in bed struggling to get to sleep. As a result, they worry about whether they will get to sleep, stay asleep, and (if they awaken) get back to sleep. They try to get more precious sleep by going to bed earlier and staying in bed later, which often makes matters worse. They end up spending even more time awake in bed struggling to get to sleep.

Sleep consolidation reverses this process by limiting the amount of time the patient spends in bed. As a result of staying awake longer, the patient's sleep drive builds up, and when she gets into bed, she is able to fall asleep easily and stay asleep.<sup>6</sup>

### Stimulus Control

Frequent bouts of struggling in bed to fall asleep condition the insomniac to associate her bed and bedroom with anxiety (conditioned arousal) and wakefulness. To break this conditioned association, CBT-i instructs the insomniac to use her bed only for sleeping and for sex. All other activities, such as reading, watching TV, phone conversations, eating, drinking, computer work, etc) should take place in another room. If the patient turns out the light and finds she is not able to get to sleep within 10 minutes, she is instructed to go into another room and engage in a relaxing activity until she feels sleepy. Once she

feels sleepy, she should go back into her bed and go to sleep.<sup>7</sup>

### Cognitive Restructuring

Changing sleep patterns requires changing the negative thoughts and beliefs the insomniac has developed about sleep because of prior negative experiences. Thoughts like "I dread getting into bed because I won't be able to get to sleep" or "This is terrible. I can't sleep and I'll be a wreck tomorrow!" are common among insomniacs. Cognitive restructuring involves changing these negative thoughts to more constructive thoughts, such as "Even if it takes a little while to fall asleep, I'll be fine tomorrow," or "I can let go and trust in my body's natural ability to sleep."<sup>8</sup>

### Sleep Hygiene

Sleep hygiene is a set of guidelines that promote healthy sleep, including the following:

Go to bed at the same time each night and wake up at the same time each morning.

Refrain from eating 2 to 3 hours before bedtime.

Avoid alcohol 2 to 3 hours before bedtime.

Avoid exposure to bright light 2 hours before bedtime.

Avoid caffeine in the afternoon and evening.

Engage in a relaxing evening routine.

Expose yourself to bright outdoor light in the morning or early afternoon.

Decrease exposure to computer screens and cell phones 1 to 2 hours before bedtime.

### Relaxation Techniques

Techniques that quiet the mind and relax the body help the insomniac to let go and

ease into sleep. Slow, deep breathing and progressive relaxation help quiet the nervous system and create conditions conducive to sleep. Mindfulness practices, including mindfulness meditation, help patients learn to observe their thoughts dispassionately. This skill is extremely helpful for quieting the mind, calming emotional reactivity, and setting the stage for sleep.

In addition to her problems with sleep, JL was experiencing digestive issues, ranging from constipation to frequent diarrhea. Her lifestyle-based physician recommended a gluten-free Mediterranean style diet, including prebiotic foods (such as avocado, artichokes, asparagus, and fermented foods) and a probiotic to address her digestive symptoms. Growing research is highlighting the link between the gut microbiome, intestinal barrier function, anxiety, and sleep disruption.<sup>9</sup> These can also be addressed in a comprehensive program to improve insomnia. In addition, she prescribed B vitamin supplements and magnesium chelate to help with digestion and anxiety.

During one of our sessions I taught JL a relaxation technique using biofeedback. She was able to see in real time how changing her breathing and quieting her mind transformed her heart rhythm, which she found very soothing. She purchased a portable heart rate variability biofeedback device, which she used to relax for 1 minute several times a day and for 10 minutes every evening as part of her presleep routine.

Patients who elect to use CBT-i in order to discontinue sleep medication are given a choice. They may stop their hypnotic-sedative or benzodiazepine medication immediately or wean gradually. JL elected to wean herself gradually, fearing that if she stopped her medication abruptly, she would not be able to sleep for several nights, and she could not afford to be sleep deprived at her job. (Some patients schedule the first few days of CBT-i treatment to coincide with time off from work. JL had no vacation time available and, thus,

arranged to implement CBT-i in the context of her regular work schedule.)

Patients often experience sleep deprivation during the first few days of CBT-i, which quickly resolves once their body adjusts to a consistent, carefully titrated sleep schedule. In fact, that sleep deprivation and corresponding increase in sleep drive is one of the primary factors that accounts for CBT-i's effectiveness. Increased sleepiness at bedtime helps patients get to sleep more easily and stay asleep more soundly. They become more confident about their ability to fall asleep and stay asleep. This growing confidence creates a self-fulfilling prophecy that helps promote healthy sleep.

At the outset of JL's treatment, she and I communicated with her primary care physician, who developed a detailed plan by which JL would be weaned from her sleep medications. I explained to JL that CBT-i generally takes 6 to 8 weeks to fully implement. In her case, because she would be weaning off her medications gradually, the process would likely take longer.

JL began the CBT-i process by keeping a sleep log for 1 week detailing when she went to sleep, how long it took her to fall asleep, how much time she spent awake during the night, and what time she got out of bed in the morning. Based on that 1 week of data, we calculated the average amount of time she slept per night, which was 7 hours and 25 minutes. We arranged for her to have a nightly sleep window of 7 hours and 30 minutes, with a bedtime of 11:30 PM and a wake-up time of 7:00 AM. She was instructed to avoid sleeping in on the weekend.

Her sleep ritual began at 10 to 10:30 PM and included turning down the lights in her apartment, taking a hot bath, using a lavender diffuser, using biofeedback-assisted relaxation for 10 minutes, and watching mindless TV for 20 to 30 minutes. Her new rescue dog who slept in her bed also helped her to calm down to sleep.

Over the next few weeks, JL's sleep gradually improved, and she no longer worried about her ability to get to sleep. After 4 weeks, she told me, "Sleep is no longer a battlefield. . . . A few weeks ago

I didn't think it could happen." After 6 weeks, she stated, "During the day I wasn't worried about not being able to sleep at night."

At the time of her final session, she was falling asleep easily and sleeping soundly through the night without any sleep medication. If she did wake up during the night, she got back to sleep easily. She summarized her new experience of sleep this way: "It's easy to fall asleep and I have no anxiety about not sleeping. My body gets signals it's time to sleep and I'm confident about sleep now."

She also shared that her newfound ability to let go, which was such an important aspect of being able to fall asleep, had generalized to other parts of her life. She was feeling much calmer and stopped obsessing about things outside of her control—in relation to work, relationships, and her daily activities.

Although CBT-i is a safe and highly effective treatment for insomnia, unfortunately, it is underutilized, primarily because of 2 reasons:

1. There is currently a shortage of trained CBT-i practitioners.
2. Patients are much more likely to learn about sleep medication as a treatment for their insomnia (via drug advertisements and prescribing physicians) than CBT-i. Physicians and health care providers can play an important role in educating their patients about CBT-i and recommending it as a first-line treatment for chronic insomnia.

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## Informed Consent

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## Trial Registration

Not applicable, because this article does not contain any clinical trials. 

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