

Cognitive Behavioral Therapy for Insomnia (CBT-I): A Comprehensive Review

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ABSTRACT

Cognitive behavioral therapy for insomnia (CBT-I) is considered the first line in treating insomnia. The CBT-I consist of various therapeutic techniques, sleep restriction, stimulus control (SC), sleep hygiene education, and relaxation techniques.

Insomnia is characterized by several symptoms with three main symptoms such as difficulty in starting sleep, maintaining sleep, and waking up earlier than desired. Interestingly, CBT-I has been shown as an effective nonpharmacologic treatment for insomnia. Cognitive behavioral therapy for insomnia works to decrease unhelpful sleep habits, dysfunctional thoughts, and worries about related to sleep that causes insomnia.

Conclusion: The CBT-I recommended as an evidence-based treatment for all insomnia patients from all ages, races, genders, and those who suffer from comorbidity mental and physical disease.

Keywords: Cognitive behavioral therapy for insomnia, Insomnia, Nonpharmacological treatment.

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INTRODUCTION

Background

The International classification of sleep disorders (ICSD-3) has identified insomnia as a distinct sleep disorder with three main criteria: difficulty in starting sleep, difficulty in maintaining sleep, and waking up earlier than desired. In addition, daytime symptoms such as mood disturbance, irritability, fatigue, daytime sleepiness, memory and attention impairment, excessive concern about sleep, and energy reduction may also be present. These symptoms must persist for at least 3 months and happen at least three-times per week with a significant impact on an individual's daily functioning (Riemann et al.). The consequences of insomnia can be risky, as it may lead to work absences, social withdrawal, and driving accidents due to daytime sleepiness and lack of concentration and attention (Cunnington et al.).¹⁻⁶ Additionally, severe insomnia can lead to mood effects, psychological effects, and physical problems (Roth). As well as there are two types of insomnia defined by the APA, primary insomnia and secondary insomnia.⁷⁻¹¹ Primary insomnia is used to distinguish insomnia which involves difficulties initiating sleep, maintaining sleep, and early morning awakenings, these symptoms are followed by significant distress and impairment in the daytime, and this type of insomnia is not related to medical, mental, or sleep disorders. Secondary insomnia includes insomnia symptoms comorbid with another medical or mental disorder or sleep disorder (Attarian).

Cognitive Behavioral Therapy for Insomnia (CBT-I)

The goal of CBT-I is to change sleep habits and unhelpful thoughts and worries that may lead to insomnia (Morin et al.). Cognitive behavioral therapy for insomnia is often involved several therapies, sleep restriction, stimulus control (SC), and sleep hygiene education. Classical CBT-I comprised relaxation techniques (Muench et al.).

Cognitive behavioral therapy for insomnia typically involves 4–8 weekly sessions with a CBT-I therapist, lasting 30–90 minutes each session, depending on the session content and patient adherence. During the initial assessment session, which usually lasts 60–90

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minutes, the therapist takes the patients' clinical history and guides them in using a sleep diary. No treatment is provided during this session, as the sleep diary is used to gather sleep–wake data to guide the therapist in setting treatment goals. Over the next one to two 60-minute sessions,¹² the therapist typically introduces SC and sleep restriction as the initial therapies. After the SC and SRT are delivered, the patient starts a new level of treatment where the total sleep time (TST) is gradually increased over the next two to five sessions. Follow-up sessions usually last around 30 minutes, unless additional treatments are integrated into the program or if the therapist needs to work on improving patient adherence. Additional treatments that may be incorporated into the treatment program include cognitive therapy (CT), relaxation techniques, and the development of a relapse prevention plan (Perlis et al.).

There are large of empirical evidence that has emphasized that CBT-I is the first line in treating insomnia and its efficacy in the long term compared with sleeping pills (Siebern and Manber). Additionally, researchers have found that sleeping pills can be effective in the short term for treating insomnia, but they also have side effects such as dizziness, amnesic episodes, cognitive impairment, and drowsiness.¹³⁻¹⁷ In addition, some individuals may experience sleep disturbance even when taking sleeping pills, leading them to increase their doses and develop a dependence on sleep medication (Rossman).

The Efficacy of CBT-I

Based on strong evidence, CBT-I is recommended as the primary nonpharmacological treatment for insomnia. Several systematic reviews have evaluated the efficacy of CBT-I. For example, a systematic review conducted by Morin et al. reviewed 48 studies and 2 meta-analyses to assess the efficacy of non-pharmacotherapy treatment for chronic insomnia which included sleep restriction, relaxation therapies, SC therapy, CT, and paradoxical intention. This review found significant improvement, with approximately 70–80% of insomniac patients benefiting from the therapy, around 50% achieving clinically meaningful results, and approximately one-third reporting improved sleep compared with before therapy.¹⁸

As well as the updated study for the previous systematic review by Morin et al. aimed to review 37 studies that examined psychological and behavioral treatment for insomnia between 1998 and 2004. This review found additional evidence that supported the original systematic review. In addition to the efficacy of the treatment, this updated review found that treatment is also effective for insomnia related to some medical and psychiatric problems. In this review, nine studies showed that older patients benefited from insomnia treatment and helped individuals to reduce their reliance on sleep medications.¹⁹ Five studies met the criteria for including psychological and behavioral therapies for insomnia, such as relaxation, SC, sleep restriction, CT, and paradoxical intention, these therapies were found to result in improvements over time. However, there was limited evidence regarding daytime fatigue, quality of life, and other psychological symptoms.

According to a systematic review by Mitchell et al., the effectiveness of CBT-I was compared with medication in the long term. The study found that CBT-I was more effective for treating insomnia when compared with sleep medications, and its effects were more persistent over time. The evidence was low to moderate level, suggesting that CBT-I was more effective than benzodiazepine and non-benzodiazepine medication in the long term, while benzodiazepines were found to be more effective in the short term based on very low-level evidence. Additionally, very low-level evidence supported the use of CBT-I in improving psychological symptoms associated with insomnia.

Cognitive Behavioral Therapy-Insomnia Formats

There are various formats of CBT-I, such as telehealth, group therapy, individual therapy, and internet-based therapy (both guided and unguided). According to a study by Simon et al., CBT-I formats that rely on communication between patients and therapists, such as individual, group, and telehealth therapy, have a large effect. On the other hand, alternative CBT-I formats such as guided and unguided internet-based therapy have a medium to large effect and can increase the scalability and accessibility of CBT-I. These formats can reach individuals worldwide who do not have access to the treatment due to a shortage of specialists who offer CBT-I in healthcare systems. Additionally, Bastien et al. suggested that delivering CBT-I in cost-effective formats such as group settings and telehealth can be promising. Furthermore, delivering CBT-I in less costly settings does not result in a loss of efficacy, and can increase treatment availability and accessibility.

As well as a study by Tsai et al. reviewed four studies on the effectiveness of digital cognitive-behavioral therapy for insomnia (dCBT-I) which has structured content and without therapists, results of this study found that it has a medium-to-large effect in

improving insomnia symptoms in both the short- and long-term for young people.²⁰ However, dCBT-I may not be suitable for individuals with complex insomnia who need professional help, such as those with insomnia accompanied by suicidal thoughts or comorbid psychiatric disorders. Therefore, dCBT-I cannot replace face-to-face CBT-I, but it can serve as a complementary treatment, with the added benefit of increasing accessibility for more people suffering from insomnia. The study also suggested that individuals who need it can follow dCBT-I with face-to-face therapy with trained therapists. Overall, the variety of CBT-I formats may increase the scalability and accessibility, and dCBT-I including guided and unguided CBT-I may offer a feasible option for in-person therapy. However, further research is necessary to demonstrate the effectiveness and limitation of dCBT-I.²¹

Assessment and Measurement for Insomnia

Behavioral sleep medicine specialists often develop a variety of assessment tools to collect information for diagnosis. Furthermore, they create sleep diaries for patients to use on a daily basis to monitor their sleep patterns, habits, and complaints. The assessment process is essential for several reasons: (1) to measure the severity of insomnia symptoms on a daily basis, (2) to identify habits that contribute to insomnia, (3) to determine the extent of circadian dysrhythmia, and (4) to collect data necessary for developing an effective treatment plan (Perlis et al.). Additionally, the diagnosis of primary insomnia does not necessarily need a polysomnographic (PSG) study to confirm the diagnosis. There are three reasons for this. Firstly, there is usually a strong correlation between the patient's subjective complaint and objective measures, making PSG assessment unnecessary to verify the sleep continuity disturbance. The second reason is that traditional polysomnography cannot reveal or quantify the underlying sleep pathophysiology that likely contributes to the patient's complaints. The third reason is that, in practical terms, third-party payers may not cover the cost of sleep studies for patients with suspected primary insomnia. However, sleep studies may be necessary if the patient displays symptoms consistent with other intrinsic sleep disorders or does not respond to treatment (Perlis et al.).²²

Cognitive Behavioral Therapy-Insomnia Components

The most popular CBT-I components for treating insomnia include sleep hygiene education, SC, sleep restriction therapy (SRT), relaxation techniques, and CT. Stimulus control therapy is considered the best behavioral technique and is known as "the gold standard" for behavioral therapy for treating insomnia. In clinical practice, CBT-I therapists often combine therapies that typically involve SC, sleep restriction therapy, and sleep hygiene (Perlis et al.).²²

Sleep Restriction Therapy

Sleep restriction therapy is recommended as one of the most effective behavioral techniques for treating insomnia (Maurer et al.), use within CBT-I or as a stand-alone treatment (Kyle et al.).⁷ Sleep restriction therapy focuses on improving sleep quality by decreasing time in bed (TIB) to the average sleep time duration due to the assumption that excessive time in bed TIB is an essential factor that maintains insomnia (Spielman et al.). It aims to set up a regular sleep and wake timetable that suits the patients' sleep needs and lifestyles. The sleep needs are recognized by reviewing the patient's sleep diary; with particular attention paid to their TST. In the initial week of therapy, patients collaborate with their

therapist to develop a sleep and wake schedule, and subsequent sessions involve adjusting the bedtime (Sidani et al.).

During the SRT period, CBT-I therapists typically advise their patients that reducing night-time sleep and minimizing day-time napping may result in increased sleepiness during the initial stages of SRT implementation. This increase in sleepiness can have a negative impact on day-time functioning. As a precaution, therapists also advise individuals not to drive or operate machines if they feel too sleepy during this period (Kyle et al.).

Stimulus Control Therapy (SCT)

The SC technique is designed to help individuals fall asleep quickly and maintain sleep at night. This is achieved by strengthening the relationship between the bed and sleep and weakening the relationship between other activities and sleep, and patients are helped to set up a regular sleep and wake timetable. Individuals with insomnia frequently participate in activities in bed that disrupt their falling asleep, such as reading, watching TV, eating, listening to music, or thinking about things.²² These activities make the bed and bedtime a sign of arousal rather than sleep. Additionally, the bedroom can become linked to anxiety and frustration due to difficulty falling asleep (Bootzin et al.).

Individuals with insomnia may also find it easier to fall asleep in chairs or on couches and may have less difficulty sleeping in places other than their beds. This is in contrast to normal sleepers, who typically prefer their bed and have a strong association between their sleep and their bed. They may have difficulty falling asleep in other places (Bootzin et al.). Overall, the purpose of SC is to establish a strong relationship between sleep and bed, and the relationship between behavior and worrying that interfere with sleep.

Typically, instructions involve the following: (1) Waking up at a fixed time every day, regardless of the number of sleep hours obtained during the night. (2) Avoid activities in the bed or bedroom other than sleep or sex. (3) Use the bedroom exclusively for sleeping. (4) Leave the bedroom if awake for 15–20 minutes. (5) Return to bed only when experiencing drowsiness.

To prevent patients from constantly checking the time, some therapists recommend leaving the bedroom when feeling awake or irritated, to re-establish a strong association between the bed and sleep (Perlis et al.).

Sleep Hygiene and Education

Sleep hygiene aims to increase habits and external conditions that enhance improving the quality or quantity of sleep while decreasing or stopping behaviors that interfere with sleep. However, sleep hygiene is recommended worldwide, the American Academy of Sleep Medicine suggests that there is insufficient evidence to recommend it as a standalone treatment (Williams et al.).

Education is a crucial component of insomnia treatment to prevent poor sleep hygiene and insomnia. Although external factors that can disturb sleep, such as noise, light, and temperature can interfere with sleep, CBT-I therapists need to educate patients about sleep hygiene, as these guidelines may not suits everyone. For example, short naps are ingrained in the lifestyles of certain cultures and do not necessarily indicate poor sleep hygiene, provided they don't lead to symptoms of insomnia or sleep disturbances. Similarly, some people can enjoy a cup of coffee or enjoying a drink with dinner, or reading in bed may not necessarily have a negative impact on their sleep. However, for some individuals, these activities may lead to insomnia. Therefore, it is crucial to advise people at the onset

of potential insomnia symptoms that inadequate sleep hygiene can contribute to the development of insomnia. (Attarian).

Sleep Hygiene Instructions Based on Perlis et al.

- Sleep only as much as necessary to feel refreshed the next day.
- Wake up at the same time every day, even on weekends.
- Exercise regularly, but avoid exercising within 3 hours of bedtime.
- Ensure your bedroom is comfortable, quiet, and dark.
- Maintain a comfortable temperature in your bedroom during bedtime.
- Avoid going to bed hungry, but also avoid heavy meals before bedtime. A light snack may help.
- Reduce liquid intake in the evening to minimize the need for the bathroom at night.
- Avoid consuming caffeine found in beverages and foods such as coffee, tea, cola, and chocolate.
- Avoid alcohol, particularly in the evening.
- Do not smoke before bedtime.
- Do not worry in bed. Set aside time earlier in the evening for problem-solving and planning.
- Use the bedroom solely for sleeping and sex. Avoid reading, watching TV, or eating in bed.
- Go to bed only when you feel drowsy.
- Move your clock or turn it away so that it is not visible.
- Avoid napping during the day.

Cognitive Therapy

The main idea behind cognitive behavioral therapy is that emotions, beliefs, and behaviors are interconnected and can impact mental health. In treating insomnia, CT aims to challenge and modify dysfunctional beliefs and unrealistic expectations about sleep. For example, if a patient believes that he needs to sleep for 8 hours to function well during the day, suggesting reducing his time in bed to less than 8 hours may be met with refusal because it contradicts the patient's beliefs.²³ To address this, it is essential to work collaboratively with the patient, to challenge and modify dysfunctional thoughts through cognitive restructuring. By changing those beliefs about sleep needs, sleep quality becomes a priority over sleep quantity, requiring a commitment to decreasing time in bed (Carney and Posner).

There are many cognitive techniques utilized in treating insomnia, for example, disputing dysfunctional beliefs which identifies and addresses dysfunctional beliefs by psychoeducation about sleep such as "everyone should sleep 8 hours." Another technique is Decatastrophizing, which includes exercise to deal with the extreme consequences, for example, "if I don't get 8 hours of sleep, I can't do anything tomorrow." Also, behavioral experiments, which include gathering information to challenge dysfunctional thoughts (Muench et al.).

Relaxation Training

Various relaxation exercises approach different physiological systems, including progressive muscle relaxation, breathing techniques, and autogenic training. Therapists typically choose the most suitable relaxation technique for their patients based on the exercise that is easiest for the patient to learn and aligns with how the patient typically experiences arousal. However, acquiring proficiency in relaxation training often necessitates practice, and many therapists suggest that patients practice the technique during

the day and before sleep for optimal results. When combining SC instructions with relaxation techniques, if relaxation training induces “performance anxiety,” it might be preferable to suggest that the patient practices in a different room rather than the bedroom. Some patients, especially those with a history of panic attacks and anxiety disorders, may demonstrate a “paradoxical response” to relaxation techniques (Perlis et al.). Therefore, therapists need to monitor their patients carefully and adjust their relaxation training as necessary to ensure its effectiveness.

CONCLUSION

To conclude, CBT-I is known as the first line nonpharmacologic treatment for moderate and severe insomnia without any side effect comparing with sleeping pills. Besides treating primary insomnia, it is also effective in treating secondary insomnia which is related to other physical and mental disorders. Resulting in improvement in sleep quality, and daytime symptoms such as mood, fatigue, daytime sleepiness, and psychological symptoms. Cognitive behavioral therapy for insomnia is a promising intervention for countless individuals struggling with insomnia worldwide.

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