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MANAGEMENT OF INSOMNIA: NON-PHARMACOLOGICAL AND PHARMACOLOGICAL APPROACHES

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ABSTRACT

Insomnia is a prevalent and persistent sleep disorder associated with significant impairments in daytime functioning, quality of life, and long-term health. It frequently co-occurs with mental and somatic conditions, yet requires independent diagnosis and targeted treatment. This review synthesizes current evidence on non-pharmacological and pharmacological therapies for insomnia across various populations. Cognitive Behavioral Therapy for Insomnia (CBT-I) remains the first-line treatment, supported by robust evidence demonstrating improvements in sleep onset, sleep maintenance, and daytime functioning. Core components, including stimulus control, sleep restriction, cognitive restructuring, relaxation techniques, and sleep hygiene, address the behavioral and cognitive mechanisms that sustain insomnia. CBT-I is effective in adults, older adults, adolescents, and perinatal populations, and often outperforms pharmacological interventions in long-term outcomes, although more research is needed to quantify sustained benefits.

Pharmacological options are typically reserved for short-term or adjunctive use. Benzodiazepine receptor agonists provide modest, transient benefits but carry substantial risks such as dependence, cognitive impairment, and falls, particularly in older adults. Safer alternatives include melatonin, melatonin receptor agonists such as ramelteon, and dual orexin receptor antagonists, which offer improved sleep quality with favourable safety profiles. Off-label agents, including low-dose doxepin, trazodone, hydroxyzine, and quetiapine, show variable efficacy and require cautious use due to limited long-term data and potential adverse effects. Special considerations apply to older adults, children, and pregnant or postpartum women, for whom behavioural interventions remain the preferred approach. Contemporary evidence supports a shift toward behavioural treatments, individualized care, and reasonable short-term medication use to reduce the clinical and societal burden of insomnia.

KEYWORDS

Insomnia, CBT-I, Melatonin, Benzodiazepine Receptor Agonists, Trazodone

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Introduction

According to the International Statistical Classification of Diseases and Related Health Problems (ICD-10), insomnia is defined as insufficient quantity and/or quality of sleep persisting over an one month. It results from inadequate sleep time (due to difficulty falling asleep, difficulty maintaining sleep continuity or premature awakening) and the feeling that sleep does not bring rest. These difficulties lead to a worsening well-being and impaired functioning during the day. To diagnose insomnia, sleep disturbances must occur for at least one month and affect at least three nights per week.

Insomnia is a common symptom of numerous mental and somatic disorders. Therefore, the diagnosis of non-organic insomnia requires the elimination of organic causes, such as neurological conditions, somatic diseases, and disorders related to the use of psychoactive substances and medications. The diagnosis of the underlying disease should be supplemented with a diagnosis of non-organic insomnia only if it dominates the clinical picture.

Insomnia is one of the most common sleep disorders. In ICD-10 insomnia is listed as one of the non-organic sleep disorders (F51.0–F51.9) under non-organic insomnia (F51.0). It is assumed that insomnia should be diagnosed in every patient who meets the diagnostic criteria, regardless of whether they have any other accompanying disorders.

Lack of proper diagnosis and failure to take appropriate therapeutic measures can have a number of negative health consequences. Studies have shown that untreated insomnia promotes the development of depressive disorders (Baglioni et al., 2011) and anxiety disorders (Ohayon et al., 2003). Sometimes this disorder precedes the first episode or recurrence of depression. Sleeplessness can also lead to the development of cardiovascular disease. Studies also point to a link between insomnia and poorer quality of life, absence from work, and increased healthcare costs.

Methodology

This review was based on a critical analysis of existing scientific evidence on insomnia treatment. The first stage involved an extensive literature search using PubMed and Google Scholar to identify contemporary research on the diagnosis and management of insomnia.

Studies addressing behavioral therapies, pharmacological options, and the clinical challenges associated with chronic insomnia were systematically reviewed. Special attention was given to the role of CBT-I as the first-line treatment and patient-related factors that influence treatment effectiveness. While not all available therapeutic approaches were examined in depth, the review underscores the need to combine non-pharmacological and pharmacological methods to optimize clinical outcomes in patients with insomnia.

Results

Non-Pharmacological Treatment

1. Cognitive Behavioral Therapy for Insomnia (CBT-I)

Cognitive behavioral therapy for insomnia is considered the first-line treatment for this disorder (Siebern et al., 2011). Among the important behavioral factors that influence insomnia, for example, are: associating the bed with wakefulness, and dysfunctional beliefs about sleep.

Cognitive Behavioral Therapy for Insomnia is a structured treatment that combines sleep education, behavioral techniques like stimulus control and sleep restriction, relaxation exercises, and strategies to change unhelpful thoughts about sleep.

For people with insomnia without other psychiatric conditions, CBT-I has been shown to improve self-reported sleep problems, reduce the time it takes to fall asleep, decrease awakenings during the night, and improve daytime functioning (Hertenstein et al., 2022). The therapy has been also adapted for people with different mental health conditions, such as adding nightmare-focused techniques for PTSD, strategies to reduce morning grogginess in bipolar disorder, and timing-based interventions for ADHD. More recently, CBT-I has been applied to patients with severe mental disorders during inpatient treatment. Studies and meta-analyses show that CBT-I is especially effective for people with psychiatric comorbidities, improving both sleep and mental health, including reducing depressive symptoms (Hertenstein et al., 2022). Overall, CBT-I is a flexible and highly effective treatment for insomnia in a wide range of patients.

CBT-I is equally effective as medication in the short term, but it is recommended as the first-line treatment in European and American guidelines due to the risks associated with sleep drugs, such as drowsiness, dizziness, dependence, and relapse after stopping the medication. Unlike pharmacological treatments, which lack strong evidence for long-term benefits, CBT-I is believed to provide lasting improvements in sleep. Although several reviews report that its effects may persist over time, there is still limited quantitative data from controlled studies on the long-term impact of full or partial CBT-I, and no meta-analysis has yet thoroughly examined these outcomes (van der Zweerde et al., 2025).

Furthermore, despite research, the impact of CBT-I on patients' quality of life and daytime functioning remains insufficiently documented. There is also a lack of studies comparing insomnia patients after therapy with healthy individuals.

2. Sleep Hygiene Education

Sleep hygiene is a set of sleep-related behaviors that are recommended to patients before starting proper psychotherapy in order to change their lifestyle and behaviors that contribute to the development and maintenance of insomnia. The basic principles of sleep hygiene include: physical activity during the day, limiting caffeine intake and avoiding alcohol before bedtime, limiting the consumption of heavy and spicy foods, avoiding emotional situations before bedtime, and ensuring appropriate conditions in the bedroom (quiet, dark, and at the right temperature). Regular sleep hours are also recommended.

Sleep-hygiene practices are an important first step in improving sleep and managing insomnia. Simple habits, such as keeping a regular sleep–wake schedule, getting 7–9 hours of sleep per night, and following a consistent bedtime routine, are linked to more restful and uninterrupted sleep (Baranwal et al., 2023). Other lifestyle practices, including regular exercise and calming activities like mindfulness or relaxation, can further support better sleep. In contrast, consuming caffeine or alcohol late in the day, eating heavy meals at night, and exposure to bright light before bed are associated with poorer sleep quality and more frequent awakenings.

Sleep-hygiene education (SHE) programs have been shown to help people improve their sleep, but their effects are generally smaller than those of cognitive-behavioral therapy for insomnia. On average, sleep efficiency improved by about 5% with SHE, and CBT-I improved it about 8% in sleep-diary-derived. SHE

usually teaches about healthy sleep habits, reducing evening stimulants, and optimizing the sleep environment, though fewer programs focus on keeping a regular sleep schedule, avoiding naps, or managing stress (Chung et al., 2018). Studies show SHE can lead to modest improvements in subjective sleep measures, such as small increases in sleep efficiency and better self-reported sleep quality. While it may not be as powerful as CBT-I, SHE can still serve as a useful first step in treating insomnia, especially in primary care settings, though more research is needed on its adherence, acceptability, and cost-effectiveness.

3. Stimulus Control Instructions

Stimulus control is considered one of the most important tools in the treatment of chronic insomnia. It is used both to improve falling asleep and to maintain sleep. This technique is based on the assumption that spending many sleepless nights in the same environment (bed, bedroom) causes this environment to be associated with sleep problems and causes anxiety and worry, which further exacerbates the symptoms of insomnia. The goal of stimulus control is therefore to change negative associations (bedroom, bed) to positive ones – related to sleep or sexual activity. The basic recommendations of the stimulus control technique are: to use the bed only as a place for sleep and sexual activity, not to perform any other activities unrelated to sleep in bed/bedroom, e.g., watching TV, reading, etc. If you are unable to fall asleep for about 15-30 minutes, it is recommended that you get out of bed and go to another room where you can do activities that promote sleepiness, such as listening to relaxing music. It is also recommended to go to bed only when you are sleepy, get up at the same time every day, and avoid naps during the day.

4. Sleep restriction therapy

Sleep restriction therapy is a therapeutic intervention developed by Spielman and colleagues.

Sleep restriction is a therapeutic method that generally involves balancing the time spent in bed with the time actually needed by a specific person to sleep. The goal of therapy is to reverse the association of bed with worrying and rumination and to stimulate and create new associations that promote sleep.

Therapy should begin by determining the times of going to bed and getting up, as well as the average sleep time. Therefore, it is recommended that the patient keep a sleep diary. In the diary, kept for two weeks, the patient notes the time currently spent sleeping (time of going to bed, time of falling asleep, and time of waking up). This is used to calculate the average sleep time.

After this time, the time spent in bed is limited to the time that the patient actually spends sleeping (time spent sleeping plus 30 minutes, but no less than 4.5-5 hours). After a week of sleep restriction, the sleep efficiency index (the ratio of sleep time to time spent in bed) is calculated and, if there is improvement, this time is gradually increased by 15 minutes (Siebern et al., 2011). It should be noted that in the initial period of this therapy, sleep time is reduced, which may lead to excessive sleepiness and fatigue during the day. However, studies have shown that after about a week, these symptoms subsided and patients experienced an improvement in sleep quality.

This therapy is not recommended for people with an average sleep time of less than 5 hours. Other contraindications include a history of mania/hypomania or epilepsy, as sleep restriction could exacerbate or lead to a recurrence of these conditions.

5. Relaxation

Relaxation techniques are often added to basic behavioral methods and are among the longest-used behavioral methods for treating insomnia. Relaxation is mainly used in patients who report difficulty falling asleep. It is intended to reduce excessive arousal, tension, fear and to lower the mental and somatic anxiety associated with going to bed.

One of the most commonly used techniques for reducing tension is progressive muscle relaxation. Various alternative methods are also introduced, including diaphragmatic breathing, visualization, yoga, biofeedback, and mindfulness meditation. All these methods aim to reduce psychological and somatic anxiety related to sleep and reduce rumination (Cvengros et al., 2015; Siebern et al., 2011).

A study evaluating the effects of relaxation in patients with insomnia found that it had an impact on nighttime sleep, but no effect on daytime functioning (Means et al., 2000). There is generally no specific time limit for relaxation techniques, but it is most often recommended to use them for about 15 minutes before falling asleep.

6. Cognitive Therapy

Therapeutic guidelines recommend combining cognitive therapy for insomnia as an additional component of behavioral therapy. The primary role of the cognitive element in CBT for insomnia is to consolidate therapeutic changes and prevent relapse.

Cognitive therapy for insomnia focuses on modifying dysfunctional beliefs about sleep and insomnia. As part of psychoeducation, patients receive reliable information about sleep and insomnia. This is intended to help correct maladaptive beliefs about sleep. The phases of sleep and its average duration, which can be highly individual, are analyzed. Factors contributing to sleep disorders are also discussed, as well as the short- and long-term consequences of sleep deprivation.

Classic cognitive therapy techniques are used to identify dysfunctional beliefs about sleep, including Socratic dialogue, the downward arrow technique, and automatic thought recording. Scales developed specifically for this purpose can also be used. The most important of these is the Dysfunctional Beliefs and Attitudes about Sleep (DBAS) scale, which has several versions, from full to abbreviated (Morin et al., 2007). This scale contains statements (e.g., "I need 8 hours of sleep at night to feel rested during the day," "I am afraid that chronic insomnia may have serious consequences for my physical health") to which the patient responds on a scale of 0–10 (Carney et al., 2010).

Various techniques are used to modify dysfunctional beliefs, primarily: cognitive restructuring, selective attention modification, mindfulness work, and paradoxical intervention.

7. Mind–Body and Behavioral Techniques

Sleep onset insomnia, or difficulty falling asleep, can reduce total sleep time and increase the risk of health problems such as heart disease, stroke, and overall mortality. Despite current treatments, 10–15% of people in the U.S. continue to experience insomnia, showing the need for additional approaches. Mind-body practices, like meditation, have been linked to shorter sleep onset, suggesting they may help improve sleep. Yoga Nidra, also called yogic sleep, is a guided meditation practice that promotes deep physical, mental, and emotional relaxation. In a pilot study, Sharpe and colleagues (2021) tested Yoga Nidra in adults with insomnia to see how it affected sleep onset, brain activity, heart rate, breathing, and mood. Twenty-two participants attended two sessions, comparing lying quietly with a session including Yoga Nidra. The study showed that Yoga Nidra is feasible and may positively influence sleep and relaxation, providing useful information for future research but it's not possible to compare scores to the general population because average values were not provided. (Sharpe et al., 2021).

Mindfulness meditation has shown promise as an effective treatment for chronic insomnia. In a randomized controlled trial, adults with chronic insomnia were assigned to mindfulness-based stress reduction (MBSR), mindfulness-based therapy for insomnia (MBTI) or a self-monitoring control. Both meditation-based interventions led to significantly greater improvements in total wake time, pre-sleep arousal, and overall insomnia severity compared to the control group. While MBSR and MBTI performed similarly immediately after treatment, MBTI showed stronger and more sustained improvements in insomnia severity at follow-up, six months post-treatment **MBTI showed the highest rates of success,** with **50% of participants in remission** and **78.6% achieving a treatment response**. These findings suggest that mindfulness meditation, particularly MBTI, may be a viable non-pharmacological option for managing chronic insomnia (Ong et al., 2021).

Pharmacological Treatment

1. Melatonin and Melatonin Receptor Agonists

Melatonin, a neurohormone produced by the pineal gland under the control of the suprachiasmatic nucleus, plays a key role in regulating sleep by promoting sleep onset and inhibiting wakefulness through MT1 and MT2 receptors. Its production follows a circadian rhythm, and levels naturally decline with age, which may contribute to insomnia in older adults (Xu et al., 2020). Exogenous melatonin, typically administered orally, has been shown to improve sleep in patients with primary insomnia and is approved for use in adults, particularly those aged 55 and older, for short-term treatment up to 13 weeks (Choi et al., 2022). Compared with conventional hypnotics, melatonin is associated with fewer side effects and is considered safe for longer-term use at doses up to 10 mg, making it a valuable option for managing sleep disturbances in middle-aged and older populations (Choi et al., 2022; Xu et al., 2020).

Melatonin is commonly available across Europe, both over the counter and by prescription, with prolonged-release (PR) melatonin approved for treating insomnia in adults aged 55 years and older (Riemann et al., 2023). Research, including short-term studies and meta-analyses, suggests that PR melatonin can offer

modest improvements in sleep outcomes for older adults, while fast-release melatonin and the synthetic agonist ramelteon generally show limited effectiveness and are not routinely recommended except when circadian rhythm issues are involved. PR melatonin may be considered for both short- and longer-term use in this population, taking into account the potential benefits and risks. A major consideration is the variability in melatonin products, which are manufactured by numerous sources and sold through a range of outlets. For safety and reliability, melatonin should be obtained only from licensed pharmacies or via a physician's prescription (Riemann et al., 2023).

Ramelteon is a melatonin receptor (MT1/MT2) agonist approved by the FDA for treating sleep-onset insomnia. It is rapidly absorbed, undergoes extensive first-pass metabolism, and has a short elimination half-life of just over one hour. Clinical studies show that ramelteon moderately reduces sleep latency in adults with chronic insomnia, with effects roughly comparable to standard hypnotic medications, though it produces minimal changes in total sleep time and little impact on sleep continuity or sleep-stage distribution. Subjective improvements in sleep are generally consistent with objective findings. The recommended dose is 8 mg, with studies indicating similar effects across a wide dosage range. Ramelteon appears to have a low risk of next-day impairment, limited side effects, minimal abuse potential, and no evidence of rebound insomnia following discontinuation (Sateia et al., 2008).

2. Benzodiazepine Receptor Agonists

Long-term use of benzodiazepine receptor agonists (BZRAs), including benzodiazepines and z-drugs, remains common in insomnia care despite evidence showing that their benefits are modest and short-lived. Research demonstrates that these medications produce only small improvements in sleep latency and total sleep time, with much of the perceived benefit likely driven by placebo effects. Versus placebo, BZRAs reduce **sleep latency** by only **10 minutes** and increase **total sleep time** by only **25.2 minutes.**

In contrast, the risks associated with prolonged use are substantial: daytime sedation, cognitive impairment, falls, fractures, motor-vehicle accidents, tolerance, and dependence all increase markedly with continued exposure. Harms often outweigh benefits within just a few weeks, yet withdrawal symptoms and rebound insomnia make discontinuation challenging. Older adults are particularly vulnerable, prompting strong recommendations against long-term BZRA use in major prescribing guidelines. Given the significant clinical and societal burden, including high healthcare costs linked to fall-related injuries, recent practice guidelines emphasize the importance of deprescribing and offer strategies to help clinicians safely taper these medications (Lee et al., 2019).

Research summarized by Lee, Farrell & Holbrook and the guideline by Pottie et al. indicates that while BZRAs may slightly improve sleep for a few weeks, their effectiveness diminishes after about four weeks, while risks such as cognitive impairment, falls, fractures, and dependence continue. Because of these concerns, clinical guidelines recommend using BZRAs for no longer than four weeks and prioritizing non-drug approaches like cognitive-behavioural therapy. Both sources emphasize that structured tapering, patient involvement, and behavioural support can help safely reduce or discontinue long-term use.

3. Dual Orexin Receptor Antagonists (DORAs)

Dual orexin receptor antagonists (DORAs) are a class of medications that block the activity of orexin neuropeptides, which are produced in the hypothalamus and play a key role in promoting wakefulness and regulating arousal. By inhibiting both orexin 1 and orexin 2 receptors, DORAs, including suvorexant, lemborexant, and daridorexant, help stabilize sleep and improve sleep quality in patients with chronic insomnia. (Carpi et al., 2023).

Dual orexin receptor antagonists have been shown to be effective and generally safe for the treatment of primary insomnia. A systematic review and network meta-analysis of 13 randomized controlled trials found that DORAs significantly improved most measures of sleep compared with placebo, although they did not significantly reduce the subjective number of awakenings. Common side effects included somnolence, abnormal dreams, fatigue, and dry mouth, but these were generally manageable (Xue et al., 2023). Comparisons among different DORAs revealed only small differences in efficacy, with lemborexant ranking slightly higher on several efficacy measures. Overall, DORAs represent a promising pharmacological option for insomnia, offering clear benefits over placebo while maintaining a favorable safety profile (Xue et al., 2023).

4. Antidepressants and Other Off-Label Agents

Low-dose doxepin has become a newer FDA-approved option for insomnia, mainly helping patients stay asleep rather than fall asleep. Evidence from a systematic review by **Yeung et al.** 2015 shows that doses between 1–6 mg offer modest improvements in sleep maintenance and overall sleep duration, with little risk of next-day drowsiness. The most frequent side effects reported were headache and somnolence which occured in less than 5% of patients. Although short-term use over one or two nights appears generally safe and somewhat effective, the small number of available studies means its broader short-term benefits, long-term safety, and potential withdrawal effects remain unclear *(Yeung et al., 2015).*

Research on hydroxyzine for insomnia is limited, but current evidence suggests it may offer short-term relief for some adults. In a systematic review of five small studies, doses ranging from 25 to 100 mg showed mixed results: some patients experienced better sleep initiation or improved overall sleep quality, while effects on sleep maintenance were inconsistent and often unchanged. Dry mouth was the most commonly reported side effect, and safety data were generally poorly documented. Because of its variable efficacy and limited long-term evidence, hydroxyzine may be considered only when other treatments are ineffective, not tolerated, or contraindicated *(Burgazli et al., 2023).*

Quetiapine, the second-generated antipsychotic drug, was developed to treat mental disorders, but its antagonistic effects on histamine H1 receptors and serotonin type 2A receptors also have a sedative effect. Quetiapine is increasingly prescribed off-label for insomnia, yet research shows very limited evidence that it actually improves sleep in the general population. Most studies are small and inconclusive, and reviews consistently report that its benefits for primary insomnia are unclear, while its risks, such as: weight gain, metabolic disturbances, movement disorders, and potential misuse, are well documented. Experts emphasize that quetiapine should only be considered when other approved sleep treatments have failed and ideally only for patients with conditions it is already indicated for, such as schizophrenia, bipolar disorder, or certain mood disorders. Even then, careful monitoring is essential, especially for metabolic changes, QTc prolongation, and emerging abnormal movements. Major professional organizations caution against using quetiapine routinely for insomnia, recommending that clinicians prioritize approved sleep medications and non-pharmacologic options such as CBT-I before turning to antipsychotics *(Modesto-Lowe et al., 2021).*

Trazodone, originally approved as an antidepressant in 1982, has become widely used at low doses for insomnia because of its unique pharmacological profile. As a serotonin antagonist and reuptake inhibitor (SARI), it blocks 5-HT2A receptors, and at slightly higher doses also antagonizes histamine H1 and α1-adrenergic receptors - actions believed to promote sleep (Jaffer et al.). Low doses (25–100 mg) can help initiate and maintain sleep with minimal next-day sedation due to trazodone's short half-life. Its calming effects may also be supported by its ability to modulate cortisol regulation within the hypothalamic-pituitary-adrenal axis. In contrast, higher doses (150–600 mg) are required for antidepressant activity through combined 5-HT2A and SERT blockade, where tolerance may develop over time.

Trazodone is considered a safe and effective option for treating insomnia, especially in people who also have depression. Although it is not officially approved for insomnia, it is one of the most commonly used off-label treatments and has shown benefits in different patient groups (Jaffer et al.). Trazodone has a low risk of dependence and usually causes only mild side effects, making it well tolerated. It may also help patients improve sleep while participating in cognitive behavioral therapy. However, more research is needed to understand its long-term effects and how well it works in children or people with insomnia linked to other conditions, like chronic pain or mental health disorders (Jaffer et al.).

Although trazodone is often used to treat insomnia in people with alcohol use disorder, evidence suggests it may actually increase alcohol cravings and interfere with efforts to reduce drinking. Most sleep problems in this population are caused by alcohol use itself, and studies indicate that serotonergic drugs like trazodone or its metabolites can heighten the risk of substance use (Pan et al.). Safer, evidence-based alternatives should be considered, and clinicians should be aware of these risks when prescribing trazodone for insomnia in patients with alcohol use disorder.

An observational study in psychiatric inpatients found that trazodone generally provided better sleep benefits than quetiapine, including longer total sleep time and fewer nighttime awakenings (Doroudgar et al.). Quetiapine did not shorten sleep latency in this study and carries a higher risk of long-term metabolic side effects. However, it may still be a useful choice for patients with bipolar disorder, where its mood-stabilizing action is clinically helpful. Trazodone was also less costly but caused more short-term gastrointestinal side effects. Because the study was not randomized and relied on nursing observations rather than objective sleep measures, the authors note that more controlled research is needed across different care settings.

Magnesium is an essential mineral that plays a key role in sleep regulation, partly by enhancing the activity of GABA, a neurotransmitter that promotes relaxation and reduces sleep onset time. Clinical trials have shown that magnesium supplementation can improve sleep duration, sleep efficiency, and subjective sleep quality, while reducing insomnia severity and sleep latency in older adults. Combined supplements containing magnesium, melatonin, and zinc have also been shown to improve morning alertness, sleep ease, and overall quality of life in individuals with primary insomnia. Magnesium is generally safe at recommended doses, though high doses may cause adverse effects, particularly in people with kidney issues, so medical guidance is advised before use (Yeom & Cho, 2022). Magnesium supplementation has gained popularity as a self-treatment for insomnia and anxiety, and preclinical studies suggest a link between magnesium levels, sleep quality, and anxiety symptoms. A systematic review of interventional trials found that most studies reported improvements in sleep parameters and self-reported anxiety, particularly at higher magnesium doses or when combined with vitamin B6 (Rawji et al., 2023). However, the studies were generally small, heterogeneous in dose, formulation, and duration, and included different populations, limiting firm conclusions. Magnesium was well tolerated, with mild side effects such as increased bowel movements. Overall, the evidence suggests that magnesium may offer modest benefits for improving sleep and reducing anxiety, especially in individuals with low baseline magnesium, though larger, well-designed trials are needed to determine optimal forms and dosages.

Individual Approach

1. Insomnia in older adults

Insomnia becomes more common with age, but it is not a normal part of aging. Factors such as medications, medical conditions, and mental health issues can increase the risk of sleep problems in older adults. Proper diagnosis requires a careful review of sleep habits and overall health. Cognitive behavioral therapy for insomnia, which includes strategies like sleep restriction, stimulus control, and good sleep hygiene, is considered the most effective first-line treatment and has better long-term outcomes than medications. Despite guidance from major organizations like the American Geriatrics Society, benzodiazepines and nonbenzodiazepine hypnotics continue to be widely prescribed to older adults, who are at higher risk for serious side effects. While there are limited situations where these medications may be appropriate, their routine use carries significant risks, especially when safer, evidence-based alternatives exist. Non-drug approaches such as CBT-I and sleep restriction or compression therapy remain the preferred first-line treatments, and when pharmacologic therapy is necessary, medications with better safety profiles should be chosen. Evidence also supports strategies for safely tapering or discontinuing benzodiazepines in older adults, although physician barriers to changing prescribing habits persist (Brewster, Riegel, & Gehrman, 2017; Markota, Rummans, Bostwick, & Lapid, 2016).

2. Adolescents and children

Insomnia is common in children, affecting up to 30% of those under five, and can have significant cognitive, emotional, and medical consequences, impacting both the child and the family's quality of life. Despite its prevalence, pediatricians often receive limited training in diagnosing and managing sleep problems. A consensus from several Spanish pediatric and sleep societies recommends that insomnia in children and adolescents be diagnosed primarily through clinical evaluation, with additional tests reserved for unclear cases or differential diagnoses. Treatment should focus on cognitive-behavioral therapy and improving sleep habits, while the routine use of medications or other substances is not supported by current clinical guidelines (Arboledas et al., 2017).

For treating sleep problems in children, evidence suggests that certain supplements and over-the-counter products may be helpful. Nutrients such as iron, hydroxytryptophan, and theanine, as well as antihistamines, have been studied for their potential to improve sleep onset, duration, and quality in pediatric populations. These interventions target the neurotransmitter systems that regulate the sleep–wake cycle, including GABA, serotonin, dopamine, and acetylcholine. While some studies show promising results, further research is needed to establish optimal dosages, safety, and long-term effectiveness, making these approaches potentially useful adjuncts to behavioral and environmental strategies for managing pediatric insomnia (Innocenti et al., 2023).

3. Pregnancy and postpartum period

Insomnia and poor sleep are common among perinatal women and are linked to an increased risk of postpartum mood disorders. In a study of 159 women with a history of depression, 20% experienced insomnia and nearly 68% reported poor sleep quality during the first six months after delivery. Postpartum insomnia and poor sleep quality were associated with higher levels of depressive and anxiety symptoms, independent of prenatal sleep patterns or demographic factors, emphasizing the importance of monitoring and addressing sleep disturbances during and after pregnancy (Okun & Lac, 2023). Cognitive Behavioral Therapy for Insomnia (CBT-I) delivered during pregnancy has been shown to improve these outcomes. In a randomized controlled trial, pregnant women with insomnia who received CBT-I experienced less wakefulness at night (excluding infant care) and lower insomnia severity at 30 weeks postpartum compared with a control group. Importantly, women who responded well to CBT-I during pregnancy maintained better sleep throughout the postpartum period, highlighting the benefit of early intervention for improving maternal sleep quality and potentially reducing postpartum mood symptoms (Manber et al., 2023).

Conclusions

Insomnia is treated as a long-term pathological condition that rarely resolves spontaneously. Based on a review of the literature, it can be concluded that cognitive-behavioral therapy for insomnia is a well-documented and effective form of therapy in various age groups. Cognitive-behavioral therapy for insomnia, which includes strategies such as sleep restriction, stimulus control, and proper sleep hygiene, is considered the most effective first-line treatment and provides better long-term results than pharmacotherapy. The advantages of cognitive behavioral therapy include the ability to tailor treatment to the individual needs of the patient. Insomnia associated with falling asleep and reduced total sleep time may increase the risk of other health problems, such as heart disease and stroke. It also contributes to an increase in overall mortality. Despite current treatments, 10–15% of people in the United States still experience insomnia, indicating a need for additional approaches.

Cognitive behavioral therapy for insomnia is considered an effective method for long-term treatment. However, there is still insufficient quantitative data from controlled studies confirming that the effects of this therapy are long-lasting. To date, there have been no meta-analyses thoroughly examining this issue in order to obtain more reliable, accurate, and general conclusions. Despite ongoing research, the impact of CBT-I on patients' quality of life and daytime functioning remains insufficiently documented. There is also a lack of studies comparing patients with insomnia after CBT-I therapy with healthy individuals.

Insomnia in older people is sometimes treated as an inevitable consequence of the aging process, which means that in many cases it is not diagnosed or treated. However, it should be noted that although changes in sleep that occur during the aging process are natural, they do not usually lead to a deterioration in well-being or negatively affect daytime functioning, unlike insomnia. The effects of cognitive-behavioral therapy used among seniors are sometimes weaker than among young people. However, this therapy can be successfully used among older people, including those who experience insomnia as a disorder co-occurring with other conditions.

Decades of evidence demonstrate that benzodiazepine receptor agonists, while capable of briefly improving sleep onset and duration, rapidly lose effectiveness and expose patients, especially older adults, to substantial harms including cognitive impairment, falls, fractures, dependence, and withdrawal. Contemporary guidelines therefore emphasize deprescribing, structured tapering, and prioritizing non-drug therapies such as cognitive behavioural therapy for insomnia (CBT-I), which consistently provides more durable improvements in sleep and functioning.

Safer pharmacologic alternatives, including melatonin, melatonin receptor agonists, and dual orexin receptor antagonists, offer additional options with more favourable safety profiles. Prolonged-release melatonin may provide modest benefits in older adults, while ramelteon and the newer DORAs demonstrate efficacy in reducing sleep latency and improving sleep quality with relatively low risks of tolerance or dependence. Off-label agents such as low-dose doxepin and trazodone show some utility, particularly when comorbid depression is present, but evidence remains variable and does not support broad routine use. Other medications, including: hydroxyzine, quetiapine, and supplements like magnesium, may be considered only after first-line behavioural approaches have been optimized, given uncertainties regarding long-term safety and effectiveness.

Importantly, insomnia affects special populations in distinct ways. Older adults face heightened vulnerability to medication-related harms, children benefit most from behavioural and environmental

interventions, and pregnant or postpartum women may require targeted strategies to reduce the risk of perinatal mood disorders. Across all groups, early identification, careful assessment of contributing factors, and individualized treatment plans grounded in evidence-based behavioural therapy remain essential.

Overall, contemporary research and clinical guidelines converge on a unified message: the management of insomnia should shift away from chronic sedative use and toward safer, more sustainable interventions. Prioritizing CBT-I, judicious short-term pharmacotherapy when necessary, and ongoing patient engagement not only improves sleep outcomes but also reduces the significant clinical, safety, and societal burdens associated with insomnia.

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