



## CLINICAL REVIEW

## A meta-analysis of group cognitive behavioral therapy for insomnia

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## SUMMARY

Insomnia is the most common sleep disorder among the general population. Although cognitive behavioral therapy for insomnia (CBT-I) is the psychological treatment of choice, the availability of individual therapy is often not sufficient to meet the demand for treatment. Group treatment can increase the efficiency of delivery, but its efficacy has not been well-established. Randomized controlled trials (RCTs) comparing group CBT-I to a control group in patients with insomnia were identified. A review of 670 unique citations resulted in eight studies that met criteria for analysis. Outcome variables included both qualitative (e.g., sleep quality) and quantitative (e.g., sleep diary) outcomes, as well as depression and pain severity, at both pre- to post-treatment and follow-up (3–12 mo post-treatment). Overall, we found medium to large effect sizes for sleep onset latency, sleep efficiency, and wake after sleep onset and small effect sizes for pain outcomes. Effect sizes remained significant at follow-up, suggesting that treatment gains persist over time. Other variables, including total sleep time, sleep quality, and depression, showed significant improvements, but these findings were limited to the within treatment group analyses. It is clear that group CBT-I is an efficacious treatment. Implications for stepped care models for insomnia are discussed.

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## Background

Insomnia represents a serious public health concern. The estimated prevalence of insomnia among the general population ranges from 10 to 30%, and these numbers are even higher in patient populations, with an estimated prevalence of 69% among primary care patients [1–4]. In addition to the distress and impairment caused by insomnia, difficulties falling and staying asleep have been linked to the development of physical and psychological problems, including diabetes, cardiovascular disease, depression, and anxiety [5–9]. Both medication and behavioral therapies have been shown to be effective in treating insomnia [10,11]. Although medications tend to be more widely utilized, there are several risks associated with this treatment approach, including possible side-effects, dependence, and tolerance. Conversely, psychological treatments are less widely available but may provide more durable treatment gains without the associated risks of sleeping medications [11]. In addition, patients tend to prefer non-pharmacological treatments [12,13].

Cognitive behavioral therapy for insomnia (CBT-I) is a widely-used evidence-based treatment for insomnia. The basic components of CBT-I include: 1) sleep restriction, which involves limiting time in bed to consolidate sleep and increase the sleep drive; 2) stimulus control, which involves restricting the behaviors that occur in the bed/bedroom to sleep and sex and ensuring that protracted periods of wakefulness do not occur in the bed/bedroom so as to promote a strong association between sleep and sleep-related stimuli; and 3) cognitive restructuring, which addresses maladaptive thoughts and beliefs about sleep in order to decrease sleep-related anxiety. Systematic reviews have shown that CBT-I improves sleep as measured by diaries and polysomnography (e.g., shorter sleep latency, less time awake, higher sleep efficiency) and sleep as measured by questionnaires (e.g., more restful sleep, higher quality of sleep) [14–16]. Interestingly, there is also some evidence that CBT-I leads to modest improvements in physical and mental health symptoms, including reductions in depression, anxiety, and pain [14,17–19]. Although the exact mechanism driving this relationship is not known, it has been theorized that better sleep leads to improvements in emotional processing and affect [20,21], as well as an increased threshold for pain [19].

In the majority of CBT-I outcome studies, the treatment is delivered over the course of 5–8 sessions of individual therapy [10,11,14]. Unfortunately, this delivery method is untenable in many

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**Glossary of terms**

Cognitive behavioral therapy for insomnia (CBT-I)	therapy for insomnia utilizing behavioral and cognitive treatment components.
Analysis of Variance (ANOVA)	statistical test.
Randomized controlled trials (RCTs)	comparison of active treatment to control group.

settings, given the demands for treatment and the limited number of trained providers [11,22,23]. In recent years, a number of alternative methods of treatment delivery have been developed to make CBT-I more widely available. These include group therapy, self-administered therapy (including computerized CBT-I and applications for mobile devices), and delivery in classroom settings. Studies have also investigated reducing the number or duration of CBT-I sessions to increase access [24]. Brief behavioral sleep treatments, which have shorter treatment duration and focus on behavioral changes, have also been widely studied, particularly within general medical settings [25,26].

Often these alternative treatment modalities are placed within a framework of stepped care models. In these models, commonly conceptualized as a pyramid, the least intensive therapy (e.g., readily accessible, lowest cost, least personal inconvenience, least specialist time) is the entry step in the model, and progressively smaller volumes of patients move into more intensive treatment as needed [22,23]. As stepped care models are increasingly applied to insomnia, it will be essential to continue investigating the efficacy and durability of lower intensity interventions. It is important to note that within stepped care models, the efficacy of lower intensity interventions is not required or expected to equal more complex treatments; however, these interventions are required to provide health benefits to a considerable proportion of patients [22]. Ultimately, systematic reviews will be crucial for consolidating the findings from clinical outcomes studies to demonstrate that low intensity treatments provide significant improvement in sleep prior to their inclusion and implementation in stepped care models.

One of the most widely studied alterations of traditional CBT-I is group CBT-I, which has been proposed as a mid-level treatment in stepped care models [22]. Although a number of randomized controlled trials (RCTs) have been published comparing group CBT-I to control conditions, there is currently no systematic review summarizing the results from these trials. The goal of this paper is to utilize meta-analytic techniques to examine the efficacy of group CBT-I in patients with chronic insomnia. Insomnia has traditionally been classified as primary or secondary to a comorbid medical or mental health disorder, however, the utility and scientific basis of this distinction has been called into question [27]. Given that it is current practice to combine primary and secondary insomnia under the heading of insomnia disorder [28], this review includes insomnia diagnoses with and without co-existing medical and mental disorders. We did code for primary vs. secondary insomnia and included this distinction in the moderator analyses since it may be informative in regard to treatment efficacy.

To provide the most rigorous test of group CBT-I, we limited the review to RCTs and examined both sleep diary and questionnaire measures of sleep disturbance. Utilizing meta-analytic techniques provides a powerful estimate of the overall magnitude of treatment gains across patient populations and treatment conditions. In addition to sleep outcomes, we examined mental and physical

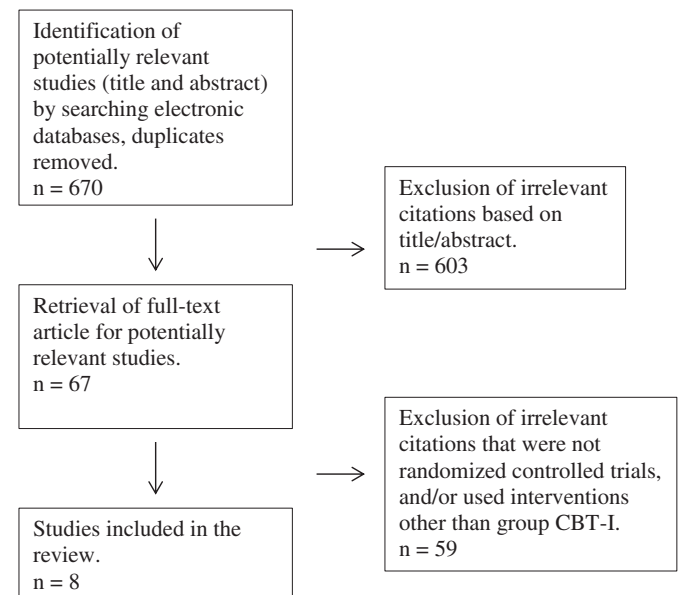
health outcomes that were not directly targeted in the CBT-I treatment (e.g., depression, pain) when they were available. Follow-up data were included in our analyses to examine the durability of treatment gains over time. Finally, this meta-analytic approach allowed us to investigate potential moderators of treatment efficacy, including type of insomnia diagnosis (primary vs. secondary), location of recruitment (clinic vs. community), average duration of insomnia, use of sleeping medication, and length of treatment.

**Method***Literature search*

Relevant studies were obtained using several methods. First, literature searches were conducted on May 15th, 2013 in PsycINFO (Ovid Interface), PubMed and Scopus (including Embase citations) using the following keywords in various combinations: CBTI, CBT, cognitive behavioral therapy, insomnia, group. Full search strategies are presented in Appendix A. This search strategy yielded 231 citations from PubMed, 130 citations from PsycINFO, and 543 citations from Scopus. After removing duplicates, there were 670 unique citations, as shown in Fig. 1. The reference lists in the relevant empirical studies were reviewed to locate additional studies that may meet inclusion criteria; none were found.

*Study selection and inclusion criteria*

All abstracts obtained with the search described above were read to determine if they met inclusion criteria. Inclusion criteria included: 1) CBT-I treatment outcome study in which CBT-I was delivered in a group format of two or more patients, 2) randomized controlled trial in which CBT-I outcomes were compared to a control group, 3) reported outcomes for at least one measure of sleep with enough detail to calculate effect sizes, 4) written in English, 5) published by May 15th, 2013, 6) published in a peer-reviewed journal. In cases where there were multiple articles using data from the same sample, data from the most complete report were included. For this analysis, group CBT-I was defined as incorporating behavioral strategies (stimulus control, sleep restriction) and cognitive strategies (addressing dysfunctional beliefs about sleep) and involved more than one session. Our inclusion



**Fig. 1.** Flowchart showing the process of selecting studies included in the review.

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