



Cognitive-behavioral therapy for sleep disturbances in treating posttraumatic stress disorder symptoms: A meta-analysis of randomized controlled trials



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HIGHLIGHTS

- Sleep-specific CBT improves PTSD and depressive symptoms and sleep problem.
- Effect sizes for PTSD and depression symptoms were medium and small, respectively.
- Effect sizes for sleep onset latency, wake time and sleep efficiency were large.
- Study attrition supports the feasibility of sleep-specific CBT in treating PTSD.

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ABSTRACT

Sleep disturbances are frequently reported in patients with posttraumatic stress disorder (PTSD). There is evidence that sleep disturbance is not only a secondary symptom but also a risk factor for PTSD. Sleep-specific psychological treatments provide an alternative to conventional trauma-focused psychological treatments. The current meta-analysis evaluated the efficacy of sleep-specific cognitive-behavioral therapy (CBT) in mitigating PTSD, sleep, and depressive symptoms. A total of 11 randomized controlled trials were included in the meta-analytic comparisons between sleep-specific CBT and waiting-list control groups at posttreatment. Random effects models showed significant reduction in self-report PTSD and depressive symptoms and insomnia severity in the sleep-specific CBT group. The corresponding effect sizes, measured in Hedges' *g*, were 0.58, 0.44, and 1.15, respectively. The effect sizes for sleep diary-derived sleep onset latency, wake after sleep onset, and sleep efficiency were 0.83, 1.02 and 1.15, respectively. The average study attrition rate of sleep-specific CBT was relatively low (12.8%), with no significant difference from the control group (9.4%). In conclusion, sleep-specific CBT appears to be efficacious and feasible in treating PTSD symptoms. Due to the relatively small number of randomized controlled trials available, further research is warranted to confirm its efficacy and acceptability, especially in comparison to trauma-specific psychological treatments.

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1. Introduction

Sleep disturbances, especially nightmares and insomnia, are some of the most frequent and distressing complaints among people who are suffering from posttraumatic stress disorder (PTSD) (Nappi, Drummond, & Hall, 2012; Spoomaker & Montgomery, 2008). In some populations, the prevalence rates of posttraumatic nightmares among those with PTSD have been estimated to be as high as 72% (Leskin, Woodward, Young, & Sheikh, 2002) to 88% (Forbes, Creamer, & Biddle, 2001). Similarly alarming estimations have been reported for insomnia (e.g., 70%–91%) (Neylan et al., 1998; Ohayon & Shapiro, 2000).

Nonetheless, the efficacy of PTSD treatments in improving sleep has been inconsistent (Nappi et al., 2012). Different aspects of sleep disturbances, such as nightmares, can persist even when the patient is in remission from PTSD (Belleville, Guay, & Marchand, 2011). Because sleep disturbances are associated with significant daytime distress and are a risk factor for the development and maintenance of PTSD (Germain, Buysse, & Nofzinger, 2008; Ross, Sullivan, Ball, & Caroff, 1989), a growing number of researchers are focusing on developing and empirically examining interventions that specifically target sleep disturbances among people with PTSD. Furthermore, given the centrality of sleep in the etiology of PTSD, it would be of interest to examine the efficacy of such sleep-focused treatments on mitigating symptoms of PTSD. The current meta-analytic review study summarized the findings of randomized controlled trials (RCTs) of cognitive-behavioral therapy (CBT) for sleep disturbances in treating PTSD symptoms. Efficacy was examined in terms of the improvements of daytime symptoms of PTSD and major depressive disorder (MDD), as well as sleep quality and continuity.

1.1. PTSD and sleep disturbances

Sleep disturbances related to PTSD typically refers to insomnia (both onset and maintenance) and posttraumatic nightmares. Both subjective report and objective data on sleep quality and continuity based on, for example, polysomnography (PSG), suggest that most people with PTSD also suffer from at least 1 form of sleep problem (Germain, 2013; Krakow et al., 2001b; Krakow et al., 2004). Indeed, a meta-analytic review study of 20 PSG studies found that those with PTSD have increased stage 1 (light) sleep and rapid eye

movement (REM) density, and decreased slow-wave sleep, compared to those without the diagnosis (Kobayashi, Boarts, & Delahanty, 2007). Sleep disturbance is thus regarded as a “hallmark” of PTSD (Ross et al., 1989).

Furthermore, in addition to the findings that PTSD may precede or cause sleep problems, a review suggests a complex bi-directional relations between the two (Babson & Feldner, 2010). Sleep disturbances, such as insomnia, REM abnormality and nightmares, measured soon after exposure to a traumatic event were found to be associated with an increased risk for subsequent onset and maintenance of PTSD (Kobayashi, Sledjeski, Spoonster, Fallon, & Delahanty, 2008; Koren, Arnon, Lavie, & Klein, 2002; Mellman, Knorr, Pigeon, Leiter, & Akay, 2004; Wright et al., 2011). In fact, this relationship was also identified between sleep disturbances and other health and mental health conditions, more generally (Clum, Nishith, & Resick, 2001; Krakow, Melendrez, Johnston, et al., 2002; Krakow, Melendrez, Warner, et al., 2002). For example, sleep disturbance and REM sleep are associated with daytime distress and impairment (Kobayashi et al., 2008; Mellman, Pigeon, Nowell, & Nolan, 2007). Such evidence lends support to the hypothesis that sleep disturbance is not merely a frequent symptom of PTSD and mood disorders, but a risk factor for these disorders as well.

1.2. Sleep-specific treatments for PTSD

Given its centrality in the etiology and phenomenology of PTSD, some researchers have argued for sleep-specific psychological treatments for people with posttraumatic sleep disturbances, rather than providing them as a supplementary option for trauma-focused treatments (Davis & Wright, 2007; Germain, 2013; Krakow et al., 2001c). In particular, cognitive behavioral treatments, including CBT for insomnia (CBT-I), imagery rehearsal therapy (IRT) and exposure, rescripting and relaxation therapy (ERRT), are the most commonly identified and empirically sound approaches that directly tackle sleep disturbances, including insomnia (Morin et al., 2006) and chronic nightmares (Casement & Swanson, 2012; Rhudy et al., 2010). CBT-I typically entails psychoeducation on sleep hygiene, sleep restriction, stimulus control, and cognitive therapy (Morin & Barlow, 1993). The therapy systematically tackles and reduces behaviors and thoughts that are interfering with sleep, including inconsistent sleep hours, naps and non-sleep related activities in bed, stimulating activities, learned associations, as well

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