

# Persistence of sleep disturbances following cognitive-behavior therapy for posttraumatic stress disorder

Geneviève Belleville\*, Stéphane Guay, André Marchand

Centre d'Étude du Trauma, Centre de Recherche Fernand-Seguin, Hôpital Louis-H. Lafontaine, Montreal, Québec (Québec), Canada H1N 3V2

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## Abstract

**Objectives:** The objectives of the present study were (1) to assess the impact of cognitive-behavior therapy (CBT) for posttraumatic stress disorder (PTSD) on associated sleep disturbances and (2) to explore the correlates of persistent sleep difficulties in terms of anxiety and depression symptoms and perceived health. **Method:** Fifty-five individuals with PTSD were administered a series of assessments designed to evaluate sleep, PTSD symptoms, symptoms of anxiety and depression, and perceived health before and after individual CBT for PTSD and at 6-month follow-up. **Results:** Significant improvements were observed on sleep quality, sleep onset latency, sleep efficiency, and sleep disturbances. These changes were not fully maintained after 6 months, and 70% of people who reported baseline sleep difficulties

(Pittsburgh Sleep Quality Index >5) still reported significant problems with sleep after treatment. Persistent sleep difficulties were associated with more severe posttraumatic, anxious, and depressive symptoms as well as poorer health. **Conclusion:** Although CBT for PTSD had a favorable impact on sleep, the majority of participants suffered from residual sleep difficulties. Individuals with persistent sleep difficulties posttreatment may experience more residual posttraumatic, depression, and anxiety symptoms and poorer mental and physical health than those who do not report sleep problems posttreatment. Further research in this area will allow clinicians to treat sleep problems in these individuals more effectively.

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## Introduction

Patients with posttraumatic stress disorder (PTSD) report a wide array of complaints and symptoms of poor sleep quality that are often presumed to be symptoms of PTSD; indeed, nightmares and problems falling or staying asleep appear among the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) [1] criteria for PTSD. However, the literature on sleep difficulties, particularly insomnia, suggests that even when a catalyst (e.g., a trauma) can be identified, perpetuating factors are often responsible for the maintenance of sleep problems over

time [2,3]. For example, a person suffering from PTSD may develop sleep disturbances following the trauma (precipitating factor). If that person repeatedly experiences sleepless nights and frightening nightmares, he or she could begin to fear and avoid going to bed at night. Subsequent behaviors such as prolonged daytime napping or chronic worry about loss of sleep constitute perpetuating factors and may contribute more to the maintenance of the sleep dysfunction than does the original trauma.

If sleep disturbances are solely symptoms of PTSD, they would be expected to remit after successful PTSD treatment. However, if perpetuating factors develop, sleep difficulties may persist posttreatment despite successful therapy for PTSD. The majority of the empirical data on this subject suggest that cognitive-behavior therapy (CBT) for PTSD has a small to moderate impact on concomitant sleep disturbances. One study assessed the impact of a single session of

\* Corresponding author. École de Psychologie, Pavillon Félix-Antoine-Savard, Bureau 1334, 2325, rue des Bibliothèques, Québec (Québec), Canada G1V 0A6. Tel.: +1 418 656 2131x4226; fax: +1 418 656 3646.  
E-mail address: genevieve.belleville@psy.ulaval.ca (G. Belleville).

exposure on each PTSD symptom, as measured by the Clinician-Administered PTSD Scale (CAPS) [4,5]. The results revealed a significant moderate treatment effect on nightmares ( $d=0.6$ ) and a small, nonsignificant effect on insomnia ( $d=0.3$ ). An online psychoeducation and exposure therapy program for participants with mild to severe posttraumatic symptoms produced a similar significant moderate improvement in sleep problems posttreatment (reported Cohen's  $d=0.6$ ) [6]. Another study reported significant improvements in sleep after CBT for PTSD, with a large effect for nightmares and a moderate effect for insomnia [7]. In a study that assessed the persistence of insomnia following individualized CBT for PTSD, 13 out of 27 patients (48%) reported residual insomnia symptoms after treatment. Further, these authors found that insomnia was one of the most severe residual symptoms posttreatment [8].

There are, however, several inconsistencies in the literature in this area. Although two studies with PTSD samples reported that CBT had very large and positive treatment effects for nightmares and other sleep disturbances [9,10], a study with a similar sample reported no significant improvement in nightmares following the application of one of two specific behavioral strategies (imaginal exposure or applied muscle relaxation) [11]. Further, three studies that used the Pittsburgh Sleep Quality Index to measure sleep in PTSD patients reported contradictory results. The first study was conducted with a sample of veteran inpatients with a long history of severe PTSD symptoms. The majority of patients reported very small changes in sleep after CBT, and only 19% of the sample demonstrated reliable improvement in sleep [12]. The average posttreatment score (12.7) suggested that persistent sleep disturbances were the rule rather than the exception. The second study [13] found a large effect of CBT on sleep in the few female outpatient rape victims who responded well to treatment for PTSD. The third study reported that CBT was effective in reducing sleep disturbances in a large sample of women who reported a sexual assault, but that most of the participants did not return to normal sleep functioning [14].

Type of trauma, PTSD chronicity, and the use of empirically supported therapies are factors that could moderate the impact of treatment on sleep. However, inconsistencies regarding the impact on sleep still emerged within studies that recruited victims of rape [13,14], or those who recruited victims of earthquake [4,5], or those who recruited people with combat-related PTSD [7,9,12,15]. Likewise, no pattern could be drawn regarding PTSD chronicity; however, in all the reviewed studies, traumatic events leading to PTSD had occurred at least 3 years before participation to the study on average. Whether impact on sleep is different in victims who are referred to treatment more rapidly is unknown. Finally, studies that have used empirically supported psychotherapies, such as CBT, cognitive processing, or prolonged exposure [8,13,14], did not appear to report greater improvements on sleep compared to those who studied less well-established treatments

[5,6,10–12]. Together, these samples show a large amount of variability that may explain the inconsistencies in the literature, highlighting the importance of investigating these relationships with a heterogeneous sample.

The findings discussed above require replication with a larger, heterogeneous sample of patients and a validated measure of sleep quality. This study aims to replicate and extend these findings in a sample of individuals suffering from PTSD from various traumatic events. The objectives of the present study are (1) to assess the impact of CBT for PTSD on associated sleep disturbances and (2) to explore the correlates of persistent sleep difficulties in terms of anxiety and depression symptoms and perceived health. The primary hypothesis is that CBT for PTSD will have a significant favorable impact on concomitant sleep disturbances, but that most participants will report significant residual sleep difficulties after treatment. The second hypothesis is that persistent sleep difficulties will be associated with more severe anxiety and depression symptoms and lower levels of perceived health.

## Method

### *Participants and procedure*

Participants with PTSD were recruited through media advertisements and through referrals from hospitals in the Montreal metropolitan area in Quebec, Canada. Further, since this study was embedded in a larger study designed to assess the impact of social support on treatment for PTSD, each participant's spouse or significant other was required to participate. Exclusion criteria included (a) under 18 years of age; (b) history of aggression by the spouse or significant other<sup>1</sup>; (c) alcohol or substance abuse/dependence; and (d) past or present psychotic episode, bipolar disorder, or organic mental disorder.

A total of 583 individuals were screened using a telephone interview. Of these, 215 appeared eligible and were invited for a thorough initial clinical assessment. Ninety-four met the criteria for PTSD and inclusion in the study. Nine individuals failed to complete the pretreatment evaluation and were excluded or dropped out after their first treatment session. Thirteen further participants were excluded during treatment: reasons for exclusion were repeated absenteeism to therapy sessions ( $n=8$ ), marital separation ( $n=4$ ), and the emergence of suicidal ideation ( $n=1$ ). Ten withdrew their participation: reasons were lack of

<sup>1</sup> These participants were initially excluded for reasons related to the primary objectives of the mother study, that is, to assess the effect of social support in PTSD treatment outcome. This study required that participants' spouse or significant other participate in the assessment and in a few treatment sessions. Since the standardized treatment under study was not designed to deal with marital violence, individuals with a history of violence in their current relationship were excluded to avoid potential exacerbation of existing relationship problems.

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