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### Special points of interest:

- A high percentage of trauma survivors have sleep difficulties.
- Sleep problems can exacerbate depression and PTSD.
- Sleep disorders also exert an independent negative impact on health and increase the risk of chronic disease and premature mortality.
- Treating underlying sleep disorders can improve trauma symptoms and general health.

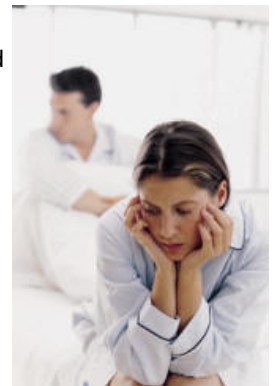


# Sleep Disorders and Trauma

## How They Impact Health in Trauma Survivors

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Sleep disturbances are common in trauma survivors, and they can exacerbate depression and PTSD, increase symptomatology, and have a negative effect on health (Krakow et al., 2000; Roberts et al., 2000). In a sample of female rape survivors with post-traumatic stress disorder, trauma-related sleep disorders had an independent impact on health, even after controlling for both depression and PTSD (Clum, Nishith, & Resick, 2001). In this article, I describe what we know about trauma-related sleep disorders, why they are relevant to health, and how treatment addresses these difficulties.



## What is a Sleep Disorder?

The term "sleep disorders" cover a wide range of problems. Some disorders are measured via patient questionnaire. Others need to be measured via polysomnographic studies, which record vital signs and other physiological measures during the night. A polysomnographic study includes an EEG (electroencephalogram) to measure brain wave activity, an EMG (electromyogram) to measure of muscle activity, and an EOG (electro-oculogram) to measure eye movements. Other measures include respiratory airflow, blood oxygen saturation, pulse, heart rate, body position and respiratory effort. Polysomnographic studies are necessary to detect problems such as sleep-disordered breathing (e.g., sleep apneas), and sleep-movement disorders (e.g., restless-leg syndrome). Patients are often unaware of these and so could not report them via patient questionnaire. Sleep disorders can be grouped into three broad categories.

- **Insomnia.** Insomnia refers to an inability to either fall asleep or stay asleep. It is often precipitated by life stress, worrying, or depression. Insomnia can also be caused by lifestyle factors, such as daytime napping, or excessive caffeine consumption.
- **Hypersomnia.** Hypersomnia refers to excessive daytime sleepiness and is a symptom associated with conditions such as sleep apnea.
- **Parasomnias.** Parasomnias are unusual behaviors that occur during sleep. These include sleep walking, bruxism (teeth grinding) and nightmares, which occur during REM sleep.

## Sleep Quality of Trauma Survivors

Several recent studies have documented sleep disturbances in trauma survivors. In one community sample, 68% sexual abuse survivors reported having sleep difficulties, with 45% having repetitive nightmares (Teegan, 1999). Hulme (2000) found that sleep problems among sexual abuse survivors were common in a primary-care sample. Fifty-two percent of sexual abuse survivors reported that they could not sleep at night and 36% reported nightmares. Intrusive symptoms were also common with 53% of sexual abuse survivors reporting sudden thoughts or images of past events.

In a sample of battered women living in shelters (N=50), 70% reported poor sleep quality, 28% went to bed very fatigued, and 40% woke up feeling very fatigued (Humphreys, Lee, Neylan, & Marmar, 1999). Moreover, 82% described one or more of the following characteristics of disturbed sleep: many wakings over the course of the night, restless sleep, and early-morning waking. Six described vivid nightmares that included recent incidents of abuse.

In a study of sleep disorders in sexual assault survivors, 80% had either sleep-breathing or sleep-movement disorders. Both of these disorders were linked to higher levels of depression and suicidality. Women who had both types of sleep disorders had the most severe symptoms. The authors speculated that fragmented sleep potentiated the symptoms for women after a sexual assault and made it more difficult for them to cope (Krakow et al., 2000). These same authors noted that since sleep medicine is not well-integrated into trauma treatment, practitioners are often less effective than they could be if they also treated underlying sleep disorders. They indicated that psychotropic medications may mask the presentation of a sleep disorder, and that clinicians may unknowingly exacerbate the psychiatric illness they are striving to treat by prescribing the medication in the first place.

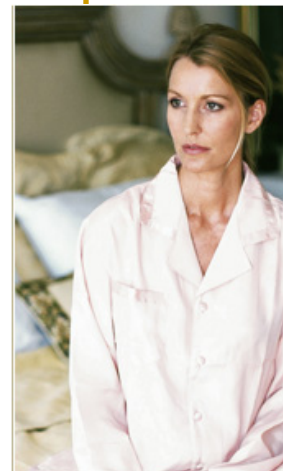
## How Sleep Impacts Health

Poor sleep quality has a number of negative effects on health. It compromises immune, metabolic, and neuroendocrine function, chronically activates the hypothalamic-pituitary-adrenal (HPA) axis, and increases mortality risk (Carmichael & Reis, 2005). McEwen (2003) noted that even short periods of disrupted sleep can wreck havoc on physical health. Disrupted sleep elevates evening cortisol levels, increases glucose and insulin levels, and increases insulin resistance. People with chronically poor sleep have more car accidents, and among people with chronic conditions, lack of sleep predicts greater functional disability and decreased quality of life. Not surprisingly, people with poor sleep use more medical services than their non-sleep-deprived counterparts (Stepanski, Rybarczyk, Lopez, & Stevens, 2003).

Smith and colleagues (2000) described the overlap between sleep and pain, with the relationship most likely being bi-directional: pain interferes with sleep and sleep disturbances increase the experience of pain. Sleep problems may also reduce a patient's ability to cope with chronic pain. In their study of 51 people with chronic pain, 88% reported some dissatisfaction with their sleep. Pre-sleep cognitive hyperarousal was the best predictor of sleep quality, regardless of pain severity. This included racing thoughts, intrusive thoughts, depressive cognitions, and worry.



*“The majority of trauma survivors in several studies report some type of disordered sleep.”*



Sleep disturbances also impact immune function by increasing levels of pro-inflammatory cytokines. High levels of inflammation increase daytime fatigue, and the body experiences disturbed sleep as a physiological stressor, further increasing inflammation (Konsman, Parnt, & Dantzer, 2002). In a sleep study of patients with major depressive disorder (MDD), inflammation was associated with sleep disturbances. Prolonged sleep latency and REM density (two markers of disturbed sleep) were better predictors of inflammation levels than were depressive symptoms. The authors concluded that sleep disturbances were at least the partial cause of elevated inflammation in depressed people (Motivala, Safati, Olmos, & Irwin, 2005). And inflammation increases the risk of both heart disease and diabetes (Kendall-Tackett, 2007).

## Treatment of Sleep Disorders

Morin and Ware (1996) recommend that a systematic assessment of sleep be incorporated into all psychological evaluations. They suggest that practitioners ask about the onset of the sleep disorder, and the temporal sequence of when the sleep disorder and the psychiatric disorder manifested. Did the symptoms of the psychiatric disorder predate the onset of sleep problems or vice versa? Polysomnographic studies can also reveal whether there are any sleep-breathing or sleep-movement disorders that might also be treated. These conditions often improve with medications and/or assistive devices. However, cognitive-behavioral interventions are appropriate for treating most sleep problems. In one recent review, it was effective for 70% to 80% of patients, and was comparable to sleep medications (Morin, 2004; Stepanski & Perlis, 2000). Cognitive-behavioral interventions help with sleep because they produce changes in REM sleep. Cognitive approaches can also address worrying and rumination that may be at the base of primary or secondary insomnia (Morin & Ware, 1996).

Cognitive therapy for insomnia includes three components: behavioral, cognitive, and educational. Behavioral aspects include establishing regular bedtimes, not using the bed for anything but sleeping and sex, getting out of bed when unable to sleep, and eliminating naps during the day. Sleep-hygiene education helps people minimize behaviors that might interfere with sleep. This might include eliminating caffeine, exercise, alcohol and smoking too close to bedtime (Morin, 2004; Stepanski & Perlis, 2000). Stress reduction includes a relaxation component that focuses on both autonomic relaxation techniques (e.g., progressive muscle relaxation) and cognitive techniques that address the worrying that keeps people from sleeping. A combination of cognitive, behavioral, and stress-reduction approaches is effective for most patients with sleep disorders.

## Conclusions

Sleep disorders are another common effect of trauma that can increase health problems in trauma survivors. By recognizing possible sleep disorders, practitioners can help patients minimize or even eliminate them. Addressing sleep disorders will likely result in lower levels of symptoms and improved health overall.



*“Sleep disorders are detected via patient questionnaire and polysomnographic studies. They include sleep-breathing disorders, such as sleep apnea, and sleep movement disorders, such as restless-leg syndrome.”*

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