



Key Facts on Sleep and Operational Stress for Navy & USMC Leaders

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Background

Sleep difficulties are a common complaint among military personnel returning from deployment to a combat zone or other environment.¹ These sleep problems can last for several months or even years post-deployment and can contribute to a broad range of medical concerns, including post-traumatic stress disorder (PTSD), alcohol abuse, depression, anxiety, decreased mental and physical functioning and an overall lesser quality of life.¹⁻⁶

Sleep Disorder Overview

Sleep disorders include insomnia, nightmares, sleep apnea, thrashing movements and difficulty with wakefulness and alertness.⁷ All can affect optimal daily functioning and emotional health by depriving an individual of quality sleep. Poor sleep can hinder coping with stressful events, and chronic sleep problems may negatively affect the body's stress systems.³ Chronic sleep deprivation can contribute to the development of various mental health and stress-related disorders, including cardiovascular disease, depression and anxiety disorders.^{3, 4, 8, 9}

Sleep and Military Deployment

Due to work schedules, sleeping conditions, combat exposure and the stressful nature of many military operational environments, most service members report their sleep quality as worse during deployment compared to at home,¹⁰ but many find that their sleep problems continue after they return home. A 2007 study from the Walter Reed Army Medical Center reported that 34% of Operation Iraqi Freedom veterans had sleep problems a year after their deployment.¹¹ Another recent study of U.S. service members found that 41% of the Operations Enduring and Iraqi Freedom (OEF/OIF) veterans in the sample reported having sleep problems soon after returning from deployment, compared to 25% of those deployed elsewhere. At the three-month follow up, sleep difficulty was reported by 36% of OEF/OIF veterans compared to 20% deployed elsewhere.¹ These findings emphasize the greater burden of sleep problems experienced by OEF/OIF veterans. One cause for these continued sleep problems is the development of such mental health conditions as PTSD, depression and generalized anxiety, all of which are common post-deployment psychological health problems¹² with sleep disturbance as a shared symptom.

Sleep and Mental Health

Insomnia is quite common among both civilians and veterans and often co-occurs with mental health disorders. A large general population study found that of the 19% of people with insomnia, 28% also had a current mental health disorder.¹³ Sleep disturbances, such as insomnia, are not just symptoms of PTSD, anxiety and depression, but can also be factors that promote development of these conditions. The stressors and work environments faced by service members while deployed can lead to insomnia and other sleep problems in theater, which, in turn, can promote development of psychological health problems.

PTSD

Sleep disruption is a common reaction to a traumatic event,¹⁴ and sleep problems may be a risk factor for the development of PTSD after a traumatic event.⁴ Sleep problems, such as insomnia and nightmares, are core symptoms of PTSD and are often the most difficult symptoms to resolve. Over 70% of PTSD patients report current insomnia, and nightmares are experienced by 19% to 71% of individuals with PTSD.¹⁵ Sleep disturbances--such as recurrent awakenings, threatening dreams and thrashing movements during sleep--are reported significantly more frequently in combat veterans with PTSD versus combat veterans without PTSD.¹⁶

Depression and Generalized Anxiety

Insomnia is found to occur in roughly three-quarters of depressed individuals.¹⁷ Sleep problems have a major impact on quality of life and are a strong risk factor for suicide in depressed individuals.¹⁷ Insomnia is also found to commonly co-occur in individuals with anxiety and has been shown to be a risk factor for developing this condition.⁹

Alcohol Abuse

Studies show that military personnel serving in support of the current global conflicts have higher rates of psychological health problems and potentially hazardous alcohol use after deployment. A 2004 study found that the percentage of U.S. Army participants who met criteria for depression, generalized anxiety or PTSD rose from 9.3% to 17.1% after deployment to Iraq. Likewise, the percentage of Army participants who reported wanting or needing to cut down on their alcohol consumption rose from 12.5% to 20.6% after service in Iraq.¹² Some of the increases in psychological and alcohol problems in these personnel may be attributed to sleep disturbances both during and after deployment.

There is a significant relationship between alcohol use and sleep problems, but the strength and direction of the association is not completely understood. Several studies have shown that alcohol use and sleep problems can each have a negative effect on the other,¹⁸ which could potentially create a destructive and deadly cycle.



Sleep and Traumatic Brain Injury

Traumatic brain injury (TBI) is one of the most common injuries affecting OEF/OIF veterans. Research demonstrates that a full spectrum of sleep disorders is common among individuals with TBI.¹⁹ About half of all TBI patients experience some form of sleep disorder and one-fourth experience excessive daytime sleepiness. Obstructive sleep apnea also is highly prevalent in this group.¹⁹

Treatment for Sleep Disorders

Sleep hygiene—the term for good habits that support healthy sleep—is recommended as the first line of treatment for a restful night and is comprised of such behaviors as daily exercise, use of relaxation techniques and adherence to a regular sleep schedule. Medications for insomnia, which include benzodiazepines, non-benzodiazepines and antihistamines, vary in their effectiveness and potential side effects but are often used for both short-term and chronic insomnia. Cognitive behavioral therapy and other non-pharmacologic interventions have also been shown to be effective for the treatment of insomnia.²⁰

Some studies have found that PTSD therapy incorporating treatment for sleep disorders can alleviate both sleep problems and PTSD symptoms. Both cognitive processing therapy and prolonged exposure have been shown to decrease sleep problems and PTSD symptoms in individuals with PTSD.²¹ Additionally, such medications as prazosin and topiramate have shown promise in the treatment of PTSD-related nightmares.^{22, 23}

Finally, because service members often attach a stigma to seeking treatment for psychological health issues, getting treatment for sleep problems, which do not appear to be stigmatized, could serve as an opportunity to assess for and initiate treatment of co-occurring PTSD, depression or generalized anxiety.

The Takeaway

Sleep problems are intricately related to operational stress and psychological health. Poor sleep experienced during and after deployment could promote the development of psychological health problems in service members. Managing stress and optimizing sleeping conditions both during and after deployment, as well as seeking treatment for sleep disorders and mental health problems, is essential to reducing the burden of sleep disorders and improving overall health among U.S. military service members.



References

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Table 1. Sleep and Operational Stress Literature Cited

Author	Objective	Participants/Design	Results
McLay et al, in preparation	To investigate insomnia and PTSD symptoms following deployment.	Post-deployment records were reviewed of 1449 initial post-deployment screenings and 775 follow-ups 3 months later.	At initial screen, insomnia was the most commonly endorsed PTSD symptom. 41% of those who had been to Iraq or Afghanistan reported sleep problems. Those who initially reported any insomnia had significantly higher overall scores for PTSD severity at follow up than did Service Members without such a complaint.
Neylan et al, 1998	To evaluate the role of combat exposure and PTSD on sleep disturbances among veterans.	1,200 male Vietnam theater veterans, 412 male Vietnam era veterans, and 450 male civilian comparison subjects were assessed by questionnaire.	Frequent nightmares were found exclusively in subjects diagnosed with current PTSD at the time of the survey (15.0%). In the sample of veterans who served in Vietnam, combat exposure was strongly correlated with frequency of nightmares, moderately correlated with sleep onset insomnia, and weakly correlated with disrupted sleep maintenance.
Meerlo et al, 2008	To review how inadequate sleep can affect the body.	Literature review	Insufficient sleep, by acting on stress systems, may sensitize individuals to stress-related disorders. Indeed, epidemiological studies suggest that sleep complaints and sleep restriction may be important risk factors for a variety of diseases that are often linked to stress, including cardiovascular diseases and mood disorders.
Spoormaker & Montgomery, 2008	To evaluate the role of sleep disturbance in PTSD.	Literature review	A growing body of evidence shows that disturbed sleep is more than a secondary symptom of PTSD-it seems to be a core feature.
Szentkiralyi et al, 2009	To provide an overview of how sleep disorders can affect other areas of functioning.	Literature review	Sleep problems are associated with psychological and social dysfunction and a reduced quality of life.
Zisapel 2007	To evaluate the effects of inadequate sleep.	Literature review	Deviant sleep patterns are associated with increased risks of morbidity, poor quality of life and mortality.

Author	Objective	Participants/Design	Results
Ford & Kamerow, 1989	To assess the relationship between sleep problems and psychiatric disorders in a community sample.	Community sample of 7954 individuals assessed by questionnaire at baseline and 1 yr follow-up.	40% of those with insomnia and 46.5% of those with hypersomnia had a psychiatric disorder compared with 16.4% of those with no sleep complaints. Risk for developing major depression was higher among those with insomnia at both time points.
Neckelmann et al, 2007	To study the relationship of insomnia to the development of anxiety disorders and depression in a population-based sample.	Participants without significant anxiety and depression at baseline were assessed in 2 surveys, at baseline and approximately a decade later (N=25,130).	Anxiety at follow-up was associated with insomnia at baseline, follow-up and both time points. Results are consistent with insomnia being a risk factor for the development of anxiety disorders.
Peterson et al, 2008	To evaluate symptoms of sleep disturbance and insomnia in deployed military personnel.	156 deployed military personnel were assessed with Military Deployment Survey of Sleep.	74% of participants rated their quality of sleep as worse in the deployed environment, 40% had a sleep efficiency of <85%, and 42% had a sleep onset latency of >30 minutes.
Hoge et al, 2004	To assess the mental health of members of the armed services who have participated in OEF/OIF.	Members of combat infantry units (three Army and one Marine Corps unit) were assessed by a survey that was administered either before their deployment to Iraq (n=2530) or 3-4 months after their return from combat duty in Iraq or Afghanistan (n=3671).	The percentage of study subjects whose responses met the screening criteria for major depression, generalized anxiety, or PTSD was significantly higher after duty in Iraq (15.6 to 17.1 percent) than after duty in Afghanistan (11.2 percent) or before deployment to Iraq (9.3 percent).
Hoge et al, 2007	To investigate the association of combat-related PTSD with physical health.	2,863 soldiers were studied using self-administered screening instruments 1 year after their return from combat duty in Iraq.	16.6% of OIF veterans met screening criteria for PTSD. 34% of OIF war veterans reported struggling with sleep a year after their deployment.

Author	Objective	Participants/Design	Results
Ohayon & Roth, 2003	To determine how the chronicity of insomnia affects the relationship of insomnia with psychiatric disorders and antecedents of psychiatric disorders.	A cross-sectional telephone survey on sleep problems was done with 14,915 general population-based subjects.	About 28% of subjects with insomnia had a current diagnosis of mental disorders and 25.6% had a psychiatric history. Presence of severe insomnia, diagnosis of primary insomnia or insomnia related to a medical condition, and insomnia that lasted more than one year were predictors of a psychiatric history.
Kato et al, 1996	To assess the frequency of short-term, post-traumatic symptoms among evacuees of the Hanshin-Awaji earthquake.	67 evacuees of the Hanshin-Awaji earthquake were assessed 3 weeks and 8 weeks after the earthquake.	Sleep disruption is one of the most commonly reported symptoms after exposure to a traumatic event.
Maher et al, 2006	To review the literature on sleep disturbances in patients with PTSD.	Literature review	70-91% of patients with PTSD have difficulty falling or staying asleep. Nightmares are reported by 19-71% of patients, and sleep disordered breathing (SDB) and sleep movement disorders are more common in patients with PTSD than in the general population.
Mellman et al, 1995	To assess physiological correlates of symptomatic sleep events in PTSD.	Study data included surveys on sleep symptoms in combat veterans with and without PTSD (N=58), sleep diary records from combat veterans with PTSD (N=52), and sleep recordings obtained from 21 combat veterans with PTSD and eight comparison subjects.	Sleep disturbances were reported significantly more frequently in combat veterans with PTSD versus combat veterans without PTSD.
Nutt et al, 2008	To review sleep problems as symptoms of depression.	Literature review	About three quarters of depressed patients have insomnia symptoms, and hypersomnia is present in about 40% of young depressed adults and 10% of older patients. The symptoms cause huge distress, have a major impact on quality of life, and are a strong risk factor for suicide.

Author	Objective	Participants/Design	Results
Stein & Friedmann, 2005	To review evidence of an association between disturbed sleep and alcohol use.	Literature review	Clinical investigations support a relationship between sleep disturbance and alcohol use, there is uncertainty in the strength and direction of the association.
Castriotta et al, 2007	To determine the prevalence and consequences of sleepiness and sleep disorders after TBI.	87 adults at least 3 months post TBI were assessed via questionnaire and polysomnography tests.	There is a high prevalence of sleep disorders (46%) and of excessive daytime sleepiness (25%) in subjects with TBI.
Ramakrishnan & Scheid, 2007	To review literature on the treatment options for insomnia.	Literature review	Insomnia treatment should begin with nonpharmacologic therapy, addressing sleep hygiene issues and exercise. Hypnotics generally should be prescribed for short periods only, and long-term treatment of chronic insomnia may be best accomplished with newer-generation nonbenzodiazepines.
Galovski et al, 2009	To compare the differential effects of cognitive processing therapy and prolonged exposure on health-related concerns and sleep impairment within individuals with PTSD.	A sample of female, adult rape survivors with PTSD (N = 108) were assessed for sleep impairment and health concerns after treatment with cognitive processing therapy or prolonged exposure.	Both prolonged exposure and cognitive processing therapy significantly decreased sleep dysfunction in the sample of women with PTSD.
Taylor et al, 2008	To review the efficacy of prazosin for the treatment of PTSD-related nightmares.	Literature review	Therapy with prazosin resulted in a reduction in PTSD-related nightmares in patients with both combat- and noncombat-related trauma.
Alderman et al, 2009	To examine the effects of topiramate on sleep and its effectiveness as add-on therapy for the management of combat-related PTSD.	An 8-week open-label pilot study of topiramate was conducted with 43 male combat veterans with PTSD.	Topiramate was effective in reducing nightmares and overall PTSD symptom severity in combat veterans with PTSD.