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Review

Insomnia in United States military veterans: An integrated theoretical model

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HIGHLIGHTS

- Chronic insomnia problems are highly prevalent among US military Veterans.
- Existing theoretical models view insomnia as a unidirectional phenomenon.
- An integrated model is proposed that explains insomnia as a chronic, cyclical problem.
- Insomnia should be viewed as a both a consequence and predictor of stress.

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ABSTRACT

Marked by difficulty falling or staying asleep and/or poor sleep leading to daytime dysfunction, insomnia contributes to functional impairment, poor health, and increased healthcare utilization when left untreated. As many as two-thirds of Iraq and Afghanistan military veterans complain of insomnia. Older veterans of prior conflicts report insomnia occurring since initial service, suggesting a chronic nature to insomnia in this population. Despite insomnia's high prevalence and severe consequences, there is no theoretical model to explain either the onset or chronicity of insomnia in this growing patient population. Existing theories view insomnia as an acute, unidirectional phenomenon and do little to elucidate long-term consequences of such problems. Existing theories also fail to address mechanisms by which acute insomnia becomes chronic. This paper presents an original, integrated theoretical model that draws upon constructs from several prominent behavioral medicine theories to reconceptualize insomnia as a chronic, cyclical problem that is both a consequence and predictor of stress. Additional research examining the relationships between stress, sleep, resilience, and outcomes of interest could inform clinical and research practices. Addressing sleep problems early could potentially enhance adaptive capacity, thereby reducing the risk for subsequent negative outcomes.

1. Introduction

Sleep is a basic biological need responsible for a range of restorative functions including emotion regulation and memory consolidation, muscle and tissue repair, and stress hormone regulation (Dement & Vaughan, 1999). Despite its necessity, sleep is often ignored as a core health behavior, rarely addressed within biopsychosocial assessments or routine primary care visits, and generally not integrated into chronic disease management programs. Sleep problems are particularly common among United States military veterans, with one-half to two-thirds of the 2.5 million U.S. military troops who served in Afghanistan (Operation Enduring Freedom, OEF) and Iraq (Operation Iraqi Freedom, OIF) complaining of insomnia problems upon returning home (Amin, Parisi, Gold, & Gold, 2010; Seelig et al., 2011). Insomnia complaints are also prevalent among veterans of earlier wars, including Vietnam and Korea conflicts. Additionally, many of these older veterans report that sleep problems initially began during or immediately following their military service and have persisted in the decades since

Abbreviations: VHA, Veterans Health Administration; OEF, Operation Enduring Freedom; OIF, Operation Iraqi Freedom; PTSD, Post-traumatic Stress Disorder; CBT-I, Cognitive Behavioral Therapy for Insomnia

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separating from the military (Hughes & Martin, 2015; Ryden et al., 2015).

These findings suggest insomnia problems are chronic within veteran populations; yet, a lack of longitudinal data prohibits researchers from identifying mechanisms that contribute to such chronicity and from understanding how such problems change over a veteran's life course. Given sleep problems are tied to a number of negative physical and psychological outcomes (Fernandez-Mendoza & Vgontzas, 2013), it is critical that researchers and clinicians develop a better understanding of this growing problem. The overarching goal of this paper is to offer a theoretical model of insomnia in the veteran population. Although this model can be applied to veterans of all ages and military cohorts, a major goal of the model is to place insomnia-like sleep problems of recently returning OEF/OIF veterans into a larger, lifespan context as a means of advocating for additional research on the role sleep problems may play in longterm health and aging. While military-specific stressors will be addressed, we believe that elements of this integrated model can be applied to other patient populations, including those who have experienced significant stress or trauma.

2. Insomnia in military veterans

Chronic Insomnia Disorder is a common behavioral sleep disorder clinically defined as dissatisfaction with sleep quantity or quality marked by complaints of difficulty falling or staying asleep, waking up earlier than desired, or sleep that is non-restorative and the cause of significant daytime impairment. Such problems are not related to other medical or sleep disorders, exist despite adequate opportunity and environment for sleep, and are endorsed three or more nights per week for three months or longer (American Psychiatric Association, 2013). Insomnia and/or insomnia-like symptoms are present in 27–54% of military personnel and veterans (Hoge et al., 2008; Mysliwiec, McGraw, Smith, Trapp, & Roth, 2013), rates that are two to three times higher than in the general U.S. adult population (Ford, Cunningham, Giles, & Croft, 2015; Roth, 2007). The rate of incident insomnia cases in military personnel saw a 19-fold increase from 2000 to 2009 (Mysliwiec et al., 2013). The prevalence of insomnia among Veterans Health Administration (VHA) users is expected to continue to rise as many troops who served after September 11, 2001 continue to retire from military service and begin accessing VHA healthcare in the coming years (Campbell, Shattuck, Germain, & Mysliwiec, 2015).

2.1. Risk factors

Both modifiable and non-modifiable risk factors contribute to insomnia. This paper addresses the role of stress regulation and coping in sleep problems with a behavioral etiology. Insomnia-like sleep problems may be a function of an individual's stress response whereby poor sleep is a function of inadequate coping and/or poor regulation of stress across physiological, cognitive, and/or emotional processes. In this context, stress refers to any event or stimulus that causes a disruption in balance, or homeostasis. Laboratory studies indicate that higher baseline levels of stress reactivity are associated with insomnia and predict future cases of the disorder (Drake, Friedman, Wright, & Roth, 2011; Drake, Richardson, Roerhs, Scofield, & Roth, 2004). In addition, individuals with insomnia have been shown to report experiencing more daily stressors and negatively evaluating such stressors (Morin & Ivers, 2003).

Initial military involvement, including enlistment and basic training, present a range of different stressors and often trigger sleep disturbance due to irregular schedules and ongoing physical, social, and emotional demands (Peterson, Goodie, Satterfield, & Brim, 2008). Deployment to a war region typically requires several days of laborious travel and crossing of multiple time zones that can disrupt one's natural circadian rhythm, or sleep schedule, and trigger sleep difficulties (Troxel et al., 2015). Deployment typically involves irregular work schedules, overnight watch demands, exposure to warzone and combat-related stressors, and risk of physical and psychological injury, including traumatic brain injury. While no research has formally documented the cause, or trajectory, of insomnia in military personnel, it is likely that one or more of the aforementioned factors served as an initial trigger of insomnia symptoms.

Recent research has focused on sleep problems among active duty military personnel, including increasing rates of incident insomnia and sleep apnea diagnoses (Mysliwiec et al., 2013), heightened mental health risks associated with insomnia symptoms (Gehrman et al., 2013), and the link between sleep and impaired work performance (Seelig et al., 2016; Troxel et al., 2015). Less research has focused on sleep after military retirement. Stressors related to military separation, or retirement, and reintegration into civilian life can also trigger insomnia (Bramoweth & Germain, 2013). Additionally, many service members experience an inability to return to a “normal” sleep schedule after experiencing short sleep duration or irregular schedules while deployed (Castro, Kintzle, & Hassan, 2015; Haynes, Parthasarathy, Bootzin, & Krakow, 2013). Additional reintegration-related stressors include readjustment to family and social circles, securing civilian employment, maintaining financial stability, and living with the physical and psychiatric comorbidities caused by deployment or combat-related stressors. These stressors can cause difficulty falling or staying asleep, or sleep that is restless and disturbed, thereby creating new sleep problems or exacerbating existing problems that began prior to or during deployment.

2.2. Consequences of insomnia

Persistent insomnia can lead to poor health outcomes and chronic conditions (Fernandez-Mendoza & Vgontzas, 2013; Taylor et al., 2007), exacerbate symptoms of traumatic brain injury (Macera, Aralis, Rauch, & MacGregor, 2013), reduce overall quality-of-life (Katz & McHorney, 2002), and increase risk for morbidity and premature mortality (Dew et al., 2003; Kripke, Garfinkel, Wingard, Klauber, & Marler, 2002). Chronic sleep problems can also negatively impact day-to-day outcomes including task performance (Pilcher & Huffcutt, 1996), stress coping (Hamilton, Delwyn, & Karlson, 2007), and management of chronic health conditions (Ahn, Jiang, Smith, & Ory, 2014).

2.2.1. Function, performance and health management

Chronic insomnia impairs function and performance across cognitive, emotional, social, and physical domains (Killgore, Balkin, & Westensten, 2006; Killgore, Kahn-Greene, Lipizzi, Newman, Kammimori & Balkin, 2008; Pilcher & Huffcutt, 1996). Adequate functioning in these areas enables veterans to adapt to and cope with daily hassles and reintegration stressors noted earlier. However, impairments in one or more domains can reduce ability to cope with acute and ongoing stressors. As a result, functional performance and independence decline, thereby decreasing the likelihood of successful reintegration into civilian life (Institute of Medicine, 2013; Pilcher & Huffcutt, 1996).

Many of these aforementioned impairments can also reduce a veteran's capacity to cope with health-related stressors, a concept of particular interest to clinicians and health services researchers within the VHA. Medically complex patients, defined as individuals with two or more chronic conditions, who are challenged by managing such conditions (Shippee, Shah, May, Mair, & Montori, 2012), represent a growing subgroup of veterans utilizing VHA healthcare (Yoon, Schott, Phibbs, & Wagner, 2011; Yu et al., 2003). Medical complexity is often marked by a cycle of ongoing acute and chronic health-related stressors. Patients cycle through these stressors and strive to achieve and maintain a balance between workload demands (i.e. management of chronic diseases) and physical and psychological resources (Zullig et al., 2016). Successful balance and management of stressors is bolstered by high physical and psychological reserve and capacity (Zullig et al., 2016).