Defense Health Agency (DHA) Clinical Communities Speaker Series

JUNE 2023 CCSS: Clinical Updates to Optimize Patient Outcomes in Primary Care

S03: Sleep: A Tool for Maximizing Health and Performance and Its Enhancement with Slow-Oscillatory Transcranial Direct-Current Electrical Stimulation (SO-tDCS)

Resource List

Musculoskeletal injuries (MSKIs) are a significant health problem in the military. Accordingly, identifying risk factors associated with MSKI to develop targeted strategies that attenuate injury risk remains a top priority within the military. Insufficient sleep has garnered increased attention as a potential risk factor for MSKI in both civilians and military personnel. Yet, there are no systematic evaluations of the potential association between sleep and MSKI in the military. The purpose of this review is to examine the relationship between sleep and injury in military personnel. Literature searches were performed in multiple electronic databases using keywords relevant to sleep quantity and quality, MSKI, and military populations. Although there is currently limited research on this topic, findings of [The Association Between Sleep and Musculoskeletal Injuries in Military Personnel: A Systematic Review](#) (2022) suggest that sleep is associated with MSKI and should be considered when designing strategies aimed at reducing MSKI risk in military personnel.

Getting enough sleep is key to good health, and studies have shown that insufficient sleep increases the risk of serious problems, including cardiovascular disease. Now, Harvard Medical School researchers based at Massachusetts General Hospital have discovered one way that sleep protects against atherosclerosis, the buildup of arterial plaques. "We have discovered that sleep helps to regulate the production in the bone marrow of inflammatory cells and the health of blood vessels and that, conversely, sleep disruption breaks down control of inflammatory cell production, leading to more inflammation and more heart disease," said Filip Swirski, HMS associate professor of radiology at Mass General and senior author of [Taking Sleep to Heart](#).(2019) "We also have identified how a hormone in the brain known to control wakefulness controls processes in the bone marrow and protects against cardiovascular disease," he said.

The article[, Incidence of insomnia and obstructive sleep apnea (OSA) in active duty United States military service members](#) (2021) reports and compares OSA and insomnia diagnoses in active duty the United States military service members. Data and service branch densities used to derive the expected rates of diagnoses on insomnia and OSA were drawn from the Defense Medical Epidemiology Database. Between 2005 and 2019, incidence rates of OSA and insomnia increased from 11 to 333 and 6 to 272 (per 10,000), respectively. Service members in the Air Force, Navy, and Marines were diagnosed with insomnia and OSA below expected rates, while those in the Army had higher than expected rates. Female service members were underdiagnosed in both disorders.

A large proportion of the population continue to suffer from undiagnosed, yet treatable, sleep conditions. Current pathways involve manual processes that are time consuming and costly. According to [An introduction to artificial intelligence (AI) in sleep medicine](#) (2021) AI has the potential to identify sleep patients on a mass-scale by enabling population-level screening using wearable devices, automate analysis of large volumes of data, to predict treatment adherence, provide more personalized treatment, improve diagnostic rates, accelerate day-to-day clinical operations, and deepen our understanding of complex sleep disorders. While AI may not replace human decision making it can augment clinicians to arrive at decisions more effectively.

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