

INCIDENCE AND FREQUENCY OF TRAUMATIC BRAIN INJURIES AFFECT SLEEP IN MILITARY PERSONNEL: A CRITICALLY APPRAISED TOPIC*^

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Objective: As our awareness of traumatic brain injuries (TBI) in athletics has evolved, we are also beginning to develop a greater appreciation of TBI in military personnel. While the role of sleep in the management of TBI in athletics has received attention, less is understood about how TBI impacts sleep patterns in military personnel. Therefore, we elected to evaluate the question, "What effect do TBIs have upon sleep in military personnel?" The aim of our critical appraisal was to understand the effect of traumatic brain injuries (TBIs) on irregular sleep in military personnel. **Design and Settings:** We conducted a PICO-based search using the following parameters: Population: military, Intervention: TBIs OR concussions OR head trauma, Comparison: military AND civilian, Outcome(s): sleep OR sleep disturbance. For our search we utilized the following databases: PubMed, SportsDiscus, Google Scholar, CINAHL, ProQuest, PEDro and Cochrane Library. The resulting articles were classified according to the Level of Evidence. **Subjects:** Active duty military personnel and military contractors. **Measurements:** Inclusion factors included articles with a level of evidence 1 or 2, which primarily addressed insomnia, sleep disorders, and TBI's. Exclusion factors included non-military populations, and articles published earlier than 2011. **Results:** In all four of our sources, individuals with TBIs reported significantly poorer sleep quality. In fact, approximately four times as many patients with a single TBI and 10 times as many patients with multiple TBIs exceeded the threshold for clinical insomnia. Insomnia, PTSD, and pain co-occurred in 51.8% of military veterans in the studies. **Conclusions:** Evidence shows that TBIs continue to be prevalent in the military personnel. Furthermore, the impact of TBI on sleep worsens as individuals experience multiple TBI. Without adequate sleep following TBI, military personnel will struggle to make full recoveries. Future research efforts will need to address TBI-related sleep deficiencies in this population and how to improve their recovery.

THROWING VELOCITY FOR BASEBALL PLAYERS IMPROVES WITH USE OF PLYOMETRIC OR BALLISTIC RESISTANCE TRAINING.*^

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Objective: In an effort to return baseball players to full active participation following injury, restoration of throwing velocity must be considered in the rehabilitation progression. The aim of this critical appraisal topic was to evaluate the literature and its ability to address the question "what is the effect of using plyometric training to increase throwing velocity in adolescent and young adult baseball players?" **Design and Study:** The design of the study was a critical appraisal topic. We conducted a search of the literature using our PICO question to guide the search. The PICO-based search defined the following parameters: Population: baseball Intervention: plyometric OR ballistic resistance AND shoulder Comparison: plyometric training protocol AND control Outcomes: baseball-throwing velocity OR (baseball AND velocity). The literature was searched for articles with a level of evidence of 3 or higher. The databases searched were PubMed, Google Scholar, PEDro database, Sport Discus, and ProQuest. Additional articles were hand searched using the reference lists in previously obtained articles. Inclusion criteria for articles were English language articles within the last ten years (2004-2014), utilizing human subjects. Intervention programs using resistance band training were accepted. Exclusion criteria was any population older than college age, a mixed gender or age pool, articles utilizing weight training unless compared to plyometric training, and examination of other throwing sports besides baseball. **Subjects:** A total of 126 male baseball players were utilized throughout the three articles that were found. All players were within an age range of 11-21. **Measurements:** Pre and post testing measures of throwing velocity served as the outcome variable or dependent variable. Additionally, questionnaires speaking to overall satisfaction with the program were considered during the analysis. A plyometric or ballistic resistance training program that utilized the stretch shortening cycle was a component in each study. **Results:** Two high quality randomized controlled trials and one non-randomized controlled trial were identified. All three studies showed a statistically significant increase in throwing velocity after the intervention. Between the three studies, there was an increase in throwing velocity of 1.5-2.2 mph with the implementation of a plyometric training program. For the questionnaires, of all participants across the studies, only one of the subjects expressed displeasure with the training program. **Conclusion:** A plyometric training protocol can significantly increase throwing velocity in a baseball player. Indeed, even a simple six week training program can increase throwing velocity, which allows for practical implementation into a rehabilitation program.