

## ABSTRACT

### **Alcohol Use and Its Consequences After Combat-Acquired Traumatic Brain Injury**

A dissertation presented to the Faculty of The Heller School for Social Policy and Management and the Graduate Faculty of Brandeis University, Waltham, Massachusetts

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High rates of both binge drinking and traumatic brain injury (TBI) are common among military personnel returning from Iraq and Afghanistan. Given the normative behavior of binge drinking in the military, alcohol may be used to cope with the stresses of combat experiences and injuries. While research on unhealthy alcohol use and its consequences after combat-acquired TBI is in its infancy, preliminary studies suggest that experiencing a TBI while deployed may be associated with increased unhealthy alcohol use post-deployment. However, these studies did not account for potential correlation between TBI and posttraumatic stress disorder (PTSD) and were limited by convenience samples.

This 3-paper dissertation examined whether combat-acquired TBI is associated with post-deployment unhealthy alcohol use and its consequences among active duty military personnel, independent of PTSD. Theories of military culture, self-medication, and physiological changes associated with TBI provided a conceptual framework for this study. The three dissertation aims were to: 1) compare the post-deployment drinking behaviors of military personnel who experienced a TBI to those who did not, 2) examine the relationship between experiencing a TBI and post-deployment negative drinking-related consequences, and 3) utilize path analysis to delineate the relative associations of TBI and PTSD with post-deployment drinking.

This observational dissertation used the 2008 Department of Defense Survey of Health Related Behaviors among Active Duty Military Personnel (HRB Survey), a worldwide population-based assessment of active duty personnel in the United States military. The survey was self-administered and anonymous, with a response rate of 70.6%. Data were weighted to account for the complex sampling design and strata.

Aim 1 used multivariate logistic regression to examine if TBI was associated with frequent binge drinking (at least weekly) in the past month among military personnel that had been on a combat deployment in the past year ( $N = 7,155$ ). Aim 2 examined the association between experiencing a TBI and negative drinking-related consequences in the past year among currently-drinking military personnel who had been on a combat deployment in the past year, but were home for at least six months ( $N = 3,350$ ). Negative binomial regression models were used

to assess the incidence rate ratios of negative drinking-related consequences, explored through a count variable made up of 22 items (0-22) that occurred in the past year because of drinking (i.e., driving while under the influence). Aim 3 used path analysis to examine whether PTSD accounted for the total association between TBI and binge drinking days in the past month, measured by a constructed ordinal variable (0-7), among a similar sample to Aim 1 ( $N = 6,824$ ).

Overall, this dissertation found that 25.6% of military personnel reported frequent binge drinking in the past month and almost 14% reported experiences consistent with a TBI on their most recent combat deployment. Aims 1 and 2 found that experiencing a TBI was associated with both increased frequent binge drinking in the past month and negative drinking-related consequences in the past year, independent of PTSD. Path analysis in Aim 3 demonstrated that TBI had both a direct effect, and indirect effect through PTSD, on binge drinking days in the past month.

This dissertation contributes to the emerging understanding of the relationship between experiencing a TBI and post-deployment drinking and its consequences, and suggests that the presence of TBI should prompt targeted alcohol assessment and brief counseling immediately after the injury and into the post-deployment months. Implications for practice, policy, and future research are discussed.

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**Defense Hearing:**

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