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Firearm Storage Practices Among Military Service Members With Suspected Traumatic Brain Injury

Ian H. Stanley, PhD^{a,*}; Brian P. Marx, PhD^a; Terence M. Keane, PhD^a; and Michael D. Anestis, PhD^b

The prevalence of suicide among US military service members has increased markedly, and most military suicides (60%–70%) are enacted with a firearm.¹ One suicide risk factor relevant to service members is traumatic brain injury (TBI).² Strikingly, the US Centers for Disease Control and Prevention found that 97% of all TBI-related suicides (2000–2017) were enacted with a firearm.³ However, the reasons for this high proportion of firearm-enacted suicides are unknown. One potential mechanism is greater unsafe storage practices among individuals with a TBI. Unsafe firearm storage practices (eg, loaded, non-secure location) are associated with increased suicide risk.⁴ In this cross-sectional secondary data analysis,⁵ we examined if service members with a suspected TBI, compared with those without, are more likely to store their firearms unsafely.

Methods

Participants were 378 firearm-owning US National Guard personnel (mean [SD] age = 27.4 [8.4] years; 91.0% male; 74.6% white; 68.0% deployment history; 62.7% active duty; 97.1% Army). A convenience sample was recruited from a joint forces training center in the southern US; units were drawn from across the country, and some were actively demobilizing from deployment. Participants provided written informed consent. Study procedures were approved by the university's institutional review board and the Department of Defense Human Research Protection Office, and the data were collected from November 2013–June 2014.

We assessed suspected TBI via the self-report Traumatic Brain Injury-4 (TBI-4), which has moderately high specificity (0.77) against a structured clinical interview for establishing a TBI diagnosis.⁶ Per recommendations,⁶

we classified service members as having a suspected TBI if they responded affirmatively to item 2 (“Have you ever been knocked out or unconscious following an accident or injury?”). We examined the TBI-4 summed score ($\alpha = .77$) as an index of the severity of a suspected TBI history. We assessed firearm storage practices via a structured self-report questionnaire and classified firearms as stored (1) unsafely (ie, loaded, non-secure location), (2) safely (ie, unloaded, secure location), or (3) mixed-secureness (ie, loaded, secure location or unloaded, non-secure location). Participants who owned more than one firearm were instructed to report on their least secure firearm. We used χ^2 tests of independence and logistic regression analyses.

Results

Overall, 27.0% ($n = 102$) of firearm-owning service members screened positive for a suspected TBI. Service members with a suspected TBI, compared with those without, were significantly more likely to report storing their firearms unsafely (26.5% vs 14.9%; $\chi^2_1 = 6.81, P = .009$). By contrast, service members with a suspected TBI were less likely than those without a suspected TBI to store their firearms safely (35.3% vs 48.9%; $\chi^2_1 = 5.58, P = .018$). The severity of a suspected TBI history was positively associated with storing a firearm unsafely (OR = 2.06, 95% CI = 1.19–3.58, $P = .010$) and negatively associated with storing a firearm safely (OR = 0.57, 95% CI = 0.36–0.91, $P = .019$). There were no significant differences in mixed-secureness of firearms regarding suspected TBI status or severity of suspected TBI history ($P_s > .05$).

Discussion

Findings of this initial investigation suggest that suspected TBI is associated with unsafe firearm storage practices among military personnel. Neuropsychiatric sequelae of TBI, such as impaired executive functioning and attendant impulsivity, may present challenges for the initiation and maintenance of safe firearm storage practices. Other potential confounders include psychiatric comorbidity associated with unsafe firearm storage practices (eg, posttraumatic stress disorder⁷) and sociodemographic factors (eg, education level). Limitations of this study include a lack of examination of confounders, reliance on a brief self-report TBI screener, use of a non-representative sample, and cross-sectional design. Pending future studies that address these limitations, interventions that promote secure firearm storage practices may need to be attentive to the unique needs of individuals with a TBI.

^aNational Center for PTSD, VA Boston Healthcare System and Department of Psychiatry, Boston University School of Medicine, Boston, Massachusetts

^bNew Jersey Gun Violence Research Center and the Department of Urban-Global Public Health, School of Public Health, Rutgers, The State University of New Jersey, Piscataway, New Jersey

*Corresponding author: Ian H. Stanley, PhD, National Center for PTSD, 150 S. Huntington Ave, Boston, MA 02118 (ian.stanley@va.gov).

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receives personal income in the form of royalties from a book focused on firearms and suicide, receives consulting and speaking fees on this topic, and is also the principal investigator on an externally funded randomized controlled trial focused on lethal means counseling for firearm suicide prevention within a military sample. The other authors report no potential conflict of interest.

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