Family Member Reports of Firearm Storage Practices and Personality Characteristics and Suicide Risk in US Army Soldiers

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INTRODUCTION

- Nearly half of all suicide deaths in the United States and approximately two-thirds of all suicide deaths in the military involve firearms.[1]
- Previous research has shown firearm storage practices to be associated with suicide risk among US Army soldiers.[2] Furthermore, symptoms of borderline personality disorder (BPD), especially impulsivity, were found to increase risk for suicide.[3]
- The purpose of this project is to examine the relationship between family-reported firearm storage practices, personality characteristics, and suicide risk among U.S. Army soldiers.

METHODS

Sample

- Reports from interviews of next-of-kin (NOK) were obtained from the Soldier Health Outcomes Study (SHOS-B), a case-control psychological autopsy study comparing suicide decedents (U.S. Army soldiers who died by suicide while on active duty; *n* = 135) to two control types: propensity-matched controls (PS; *n* = 128) and Army soldiers reporting suicidal ideation in the past year (*n* = 108).[4]

Measures

- The psychological autopsy interview was developed using a measure-development procedure that involved:
  - (a) extensive literature reviews of prior autopsy studies;
  - (b) review of measures used in these prior studies; and
  - (c) to the extent possible, mirroring the questions asked of family members and supervisors to facilitate comparisons across informants.[5,6]

Analyses

- Multivariable logistic regression analyses were used to assess firearm storage practices, history of mental health disorders from the military medical record[7], and lifetime history of personality characteristics as predictors of suicide death.
- Trait impulsivity was assessed using items from the UPPS Behavior Scale.[8]
- Borderline personality disorder (BPD) score summed reported symptoms.[9,10]
- Coefficients were exponentiated in logistic models to create ORs with 95% CIs.
- X^2 tests were performed when fitting the models.
- SAS Software version 9.4 used for all analyses. [11]

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RESULTS

- BPD score from NOK reports predicted increased suicide risk compared to PS controls (OR [95% CI] 1.3 [1.1,1.6]; $\chi^2$10.14, p = 0.0015) after adjusting for covariates including a history of a lifetime mental health disorder diagnoses from the military medical record (OR [95% CI] 4.1 [1.7, 9.8]; χ^2 9.84, p = 0.0017). Impulsivity, anger, and unsecured firearm storage practices were not significant in multivariable analysis.

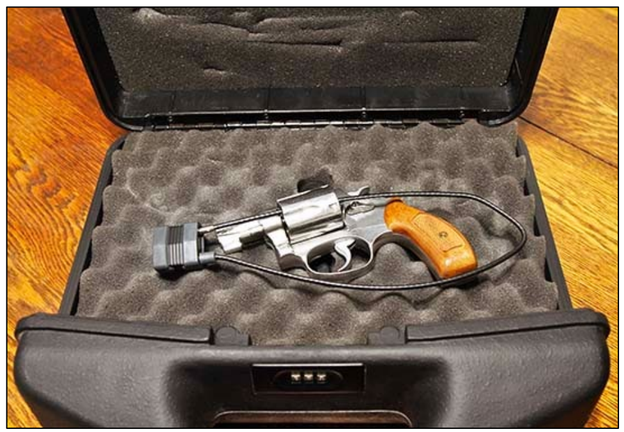

Fig 1. Revolver in lock case with combination lock. (2022). UC Davis Health [Image]. Retrieved from https://health.ucdavis.edu/news/headlines/how-to-protect-kids-from-gun-violence-at-home/2022/06[12]

Table 1. Family member reports of Firearm Storage Practices and Personality Characteristics among US Army Soldiers

Variable	Cases *n* = 61	12M Suicide Ideation Controls *n = 108*				Propensity-matched (PS) Controls *n* = 128			
Characteristics	n (w%)	n (w%)	OR(95%CI)	χ^2	p-value	n (w%)	OR(95%CI)	χ^2	p-value
Lifetime Mental Health Disorder Diagnoses [a] Yes vs No	47 (78%)	70 (61.5%)	1.1 (0.2,6.1)	0.02	0.8975	54 (39.8%)	**4.1 (1.7,9.8)***	**9.84**	**0.0017***
Impulsivity Score[b] Mean (SD)	3.48 (2.21)	2.24 (0.61)	1.1 (0.7,1.6)	0.09	0.7633	2.74 (2.71)	0.9 (0.8,1.1)	1.06	0.3032
Anger Score Mean (SD)	2.72 (2.61)	1.50 (2.08)	1.1 (0.7,1.7)	0.11	0.7401	1.38 (2.11)	1 (0.9,1.3)	0.19	0.6615
Firearm Storage [c] Unsecured vs Secure	47 (82.1%)	73 (72.1%)	1.1 (0.2,5.4)	0.02	0.8854	88 (69.9%)	1 (0.4,2.4)	0	0.9436
Borderline Personality Symptoms Score Mean (SD)	3.37 (2.18)	2.05 (1.79)	1.2 (0.8,1.8)	0.76	0.3821	1.65 (1.72)	**1.3 (1.1,1.6)***	**10.14**	**0.0015***

Notes: * values are significant at p-value <0.05 (cases vs controls).
Each predictor was adjusted for deployment status and years of active service. Firth correction was applied to cell with n <5.
a) Mental Health Disorders Diagnoses are from the military medical record.
b) Overall impulsivity score totals all impulsivity items (urgency, perseverance, sensation seeking, and premeditation; two items each)
c) Secure firearms are locked and unloaded, Unsecured firearms are unlocked and/or loaded.
Abbreviations: OR = Odds Ratio, CI = Confidence Interval, χ2 = Wald Chi-square; W% = weighted percentages

CONCLUSION

- Contrary to our hypothesis, family reports of unsecured storage practices, impulsivity, and anger were not significant predictors of suicide death.
- Reports of BPD symptoms significantly predicted suicide death, even after controlling for lifetime history of mental disorders..
- A limitation of the study is the relatively small sample size, limiting our power to detect smaller effects or to test for interactions.
- Future research may explore the effectiveness of early identification of BPD traits and interventions on suicide death in US Army soldiers.

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