Relationships Between Adult Bullying Behaviors and Suicide Risk: Results From a Psychological Autopsy Study of U.S. Army Servicemembers

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INTRODUCTION

- The suicide rate among US Army Soldiers increased dramatically after the Iraq and Afghanistan wars in 2012 and continues to be a concern. Despite increased and ongoing research efforts, an understanding of risk and protective factors for suicidal behavior among Soldiers is far from complete.

- Recent research reported bullying events that occurred in the month prior to death by informants (e.g. allegations made against decedents, unnecessary tasks, being ignored/excluded, persistent criticism, and being reminded of mistakes) were correlated with higher likelihood of death by suicide.[1,2]

- The objective of this study is to identify the extent to which the presence of bullying from military peers, superiors, subordinates, friends or family members are risk factors in US Army active component soldiers as reported by informants.

METHODS

Sample
- Data were obtained from the Soldier Health Outcomes Study (SHOS-B), a component of the Study to Assess Risk and Resilience in Servicemembers (STARRS-LS).[3] SHOS-B is a case-control psychological autopsy study of suicide.[4] Cases consisted of suicide decedents (n = 135) who were compared to a probability sample of living controls (n = 236) weighted to be representative of the Army. Controls Next-of-kin (NOK) and Army Supervisors (SUP) for each case and control soldier were interviewed.

Measures
- We developed a psychological autopsy interview 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
- Mulitvariable logistic regression analysis predicted suicide death using all variables significant in univariate analyses after False Discovery Rate (FDR)[7] adjustment as a predictor in one model controlling for covariates.
- Coefficients were exponentiated in logistic models to create ORs with 95% CIs.
- X^2 tests were performed when fitting the models.
- All tests were two sided and p-value <. 05 was significant.
- Firth correction used for cell size < 5.

RESULTS

Next-of-Kin:
- Soldiers who had allegations made against them in the month prior to death were 4.6 times as likely to die by suicide (OR = 4.6 [95% CI = (1.5, 13.7)]) than propensity-score matched (PS) controls.
- Soldiers who experienced bullying events by either military peers, superiors, subordinates, friends, or family members were 3.7 times as likely to die by suicide (OR = 3.7 [95% CI = (1.6, 8.7)]) than PS controls.

Table 1: Multivariable Analyses of Next-of- Kin Reports of Bullying Events amd Suicide Risk

Characteristic	Cases		Controls (12-Month Ideation)				Controls (Propensity)			
	n = 61		n = 108				n = 128			
	n	Weighted %	n	Weighted %	OR[1]	(95% CI)	n	Weighted %	OR	(95% CI)
Had allegations made against him/her										
Weekly or more often	1	3.96	5	4.87	0.6	(0.0,12.3)	3	3.20	2.1	(0.4,11.6)
Less than weekly, but at least once	11	19.65	9	8.20	1.8	(0.2,13.2)	6	4.26	4.6*	(1.5,13.7)
Never	45	76.39	89	86.92	REF	REF	115	92.54	REF	REF
χ^2, p-value					0.51, 0.7762				7.45, 0.0242*	
Experienced bullying behavior by any of the following: military peers, superiors, subordinates, friends, or family members[2]										
0	24	37.45	59	55.05	REF	REF	75	61.53	REF	REF
1	15	31.00	18	19.35	1.8	(0.3,9.9)	15	10.48	3.7*	(1.6,8.7)
2	7	13.39	16	17.82	0.8	(0.1,5.2)	23	20.44	0.7	(0.3,2.1)
3+	10	18.17	9	7.78	1.8	(0.2,14.0)	10	7.55	2.5	(0.9,7.0)
χ^2, p-value					1.05, 0.7882				14.6, 0.0021*	

*p-value <0.05 (cases vs controls)
[2] Scale variable where 1 point is given for each of the following types of individuals that bullied the soldier: peers, superiors, subordinates, friends, and family members
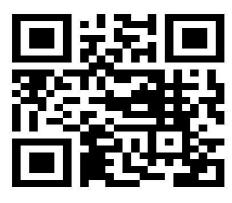
Table 2: Multivariable Analyses of Supervisor Reports of Bullying Events amd Suicide Risk

Characteristic	Cases		Controls (12-Month Ideation)			Controls (Propensity)		
	n = 107		n = 73			n = 80		
	n	Weighted %	n	Weighted %	OR	(95% CI)	n	Weighted %	OR	(95% CI)
Was ignored, excluded or isolated										
Ever vs. Never	13	13.52	5	8.89	0.8	(0.1,6.0)	3	3.59	2.3	(0.7,7.6)
χ^2, p-value					0.05, 0.819				1.83, 0.1756	
Experienced persistent criticism of his/her work and effort										
Ever vs. Never	23	23.75	9	12.87	1.7	(0.3,11.1)	8	10.2	1.3	(0.6,3.3)
χ^2, p-value					0.30, 0.581				0.42, 0.5148	
Had allegations made against him/her										
Ever vs. Never	20	20.70	3	4.04	3.1	(0.3,29.7)	3	2.69	5.8*	(1.8,18.3)
χ^2, p-value					0.94, 0.3317				8.98, 0.0027*	
Experienced bullying behavior by any of the following: military peers, superiors, subordinates, friends, or family members										
Any of these vs. None of these	63	63.09	41	58.12	0.7	(0.2,3.0)	32	41.49	1.4	(0.8,2.6)
χ^2, p-value					0.25, 0.6152				1.19, 0.2759	

*p-value <0.05 (cases vs controls)

Supervisors:
- Soldiers who had allegations made against them in the month prior to death were 5 times as likely to die by suicide (OR = 5.8 [95% CI = (1.8, 18.3)]) than propensity-score matched (PS) controls.

CONCLUSION

- Family members and supervisors reported bullying events in the month prior to death of suicide decedents. Specifically, informants reported the frequency of allegations made against suicide decedents prior to death.

- Reporting which and how many groups (military peers, subordinates, supervisors, friends, and/or family members) engaged in bullying behaviors may be an important target for intervention and the prevention of suicide.

- One of the major limitations of the study is the relatively small sample size, limiting our power to detect smaller effects or to test for interactions.

- Future research is needed to develop comprehensive measures of bullying in military populations.[2]

REFERENCES

1. Dhanraj, N., Griffith, L.M., Dempsey, C.L., Benedek, D.M., Nock, M.K., Zuromski, K., Ao, J., Georg, M.W., Haller, K., Aliaga, P.A., Brent, D., Heeringa, S.G., Kessler, R.C., Stein, M.B., Ursano, R.J. (2023, May). Bullying from military peers, superiors, subordinates, friends or family members in the month prior to suicide: Results from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). Poster presented at USUHS Research Days. Bethesda, MD.
2. Campbell-Sills, L., Sun, X., Kessler, R. C., Ursano, R. J., Jain, S., & Stein, M. B. (2023). Exposure to bullying or hazing during deployment and mental health outcomes among US Army soldiers. JAMA Network Open, 6(1), e2252109-e2252109. https://doi.org/10.1001/jamanetworkopen.2022.52109
3. Ursano, R. J., Colpe, L. J., Heeringa, S. G., Kessler, R. C., Schoenbaum, M. and Stein, M. B. (2014). The Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). Psychiatry, 77(2), 107-119. doi: 10.1521/psyc.2014.77.2.107
4. Nock, M. K., Dempsey, C. L., Aliaga, P. A., Brent, D. A., Heeringa, S. G., Kessler, R. C., … Benedek, D. (2017). Psychological Autopsy Study Comparing Suicide Decedents, Suicide Ideators, and Propensity Score Matched Controls: Results from the Study to Assess Risk and Resilience in Service Members (Army STARRS). Psychological Medicine, 1-12. doi:10.1017/S0033291717001179
5. Conner, K. R., Beautrais, A. L., Brent, D. A., Conwell, Y., Phillips, M. R. & Schneider, B. 2011. The next generation of psychological autopsy studies: Part 1. Interview content. Suicide and Life-Threatening Behavior, 41, 594-613.
6. Conner, K. R., Beautrais, A. L., Brent, D. A., Conwell, Y., Phillips, M. R. & Schneider, B. 2012. The next generation of psychological autopsy studies: Part 2. Interview procedures. Suicide and Life-Threatening Behavior, 42, 86-103.
7. Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. Journal of the Royal Statistical Society, Series B (Methodological), 57(1), 289-300. Retrieved from http://www.jstor.org/stable/2346101