



Sex-Based Differential Predictors of Suicide Ideation and Suicide Attempts in Psychiatric Aeromedical Evacuations from OEF and OIF

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Introduction

- ★ Deployed military service members (SMs) may develop psychological health symptoms and have suicide risk factors that require a psychiatric aeromedical evacuation (Straud et al., 2020).
- ★ Sex-based differences have been previously identified in aeromedical evacuations (Moore et al., 2021), yet little is known about possible differences in demographic and military characteristics associated with suicide-related aeromedical evacuations.
- ★ Considering this, we explored sex-based differences in factors associated with suicide-related aeromedical evacuations among SMs.

Methods

- ★ This study used archival data from U.S. Transportation Command Regulating and Command and Control Evacuation System (i.e., personal and military demographics) and and Defense Manpower Data Center (i.e., chart data from aeromedical evacuation) for service members who were deployed in support of OEF or OIF between 2001-2013 ($N = 7752$).
- ★ Suicide-related aeromedical evacuations were those associated with (i) suicidal ideation or (ii) suicide attempt(s).
- ★ Overall, 1.44% (112/7752) were evacuated for suicidal ideation and 20.5% (23/112) were females.
- ★ Related aeromedical evacuations for suicide attempts, 1.78% (138/7752) of service members were evacuated from OEF or OIF and 31.9% (44/138) were females.
- ★ To address the study aims, we examined loglinear models to explore three-way interactions between gender, suicide-related variables, and both military and demographic factors, and followed up with Pearson chi-squares and standardized residuals (zs) to explore observed significant differences. All analyses were conducted in SPSS v31.

Results

- ★ There were no sex-based differences in the distribution of aeromedical evacuations related to suicidal ideation between males and female SMs.
- ★ However, there were sex-based differences in the distributions related to suicide attempts. More specifically, differences were observed across education and branch.

Table 1. Distribution of frequencies of aeromedical evacuations associated with suicide attempts across demographic and military characteristics.

	Total				X^2	p
	<i>No Attempt</i>		<i>Attempted</i>			
	<i>N</i>	%	<i>N</i>	%		
Education Level						
High school or less	6046	83.1%	117	90.7%	16.669	<.001
Some college	631	8.7%	5	3.9%		
Bachelor's degree	457	6.3%	3	2.3%		
Advanced degree	138	1.9%	4	3.1%		
Branch						
Air Force	298	3.9%	8	5.8%	12.733	.005
Army	6372	83.7%	123	89.1%		
Marine Corps	728	9.6%	4	2.9%		
Navy	216	2.8%	3	2.2%		



Scan QR to see Table 1

Table 2. Sex-differences in the distribution of frequencies of aeromedical evacuations associated with suicide attempts across demographic and military characteristics

	Females				X^2	p	Males				X^2	p
	<i>No Attempt</i>		<i>Attempted</i>				<i>No Attempt</i>		<i>Attempted</i>			
	<i>N</i>	%	<i>N</i>	%			<i>N</i>	%	<i>N</i>	%		
Education Level												
High school or less	837	75.4%	37	90.2%	18.868	<.001	5209	84.5%	80	90.9%	2.178	.498
Some college	134	12.1%	0	0.0% ^a			497	8.1%	5	5.7%		
Bachelor's degree	113	10.2%	0	0.0% ^a			344	5.6%	3	3.4%		
Advanced degree	26	9.8%	4	9.8% ^b			112	0.0%	0	0.0%		
Branch												
Air Force	64	5.5%	0	0.0%	5.410	.109	234	3.6%	8	8.5% ^b	8.920	.023
Army	1013	86.5%	44	100.0%			5359	83.2%	79	84.0%		
Marine Corps	60	57.8%	0	0.0%			668	10.4%	4	4.3%		
Navy	34	2.9%	0	0.0%			182	2.8%	3	3.2%		



Scan QR to see Table 2

- ★ Female SMs who had some college education ($z = -2.2$) or a bachelor’s degree ($z = -2.0$) were underrepresented among those who were evacuated for suicide attempt.
- ★ Meanwhile, female SMs with advanced degrees ($z = 2.8$) were overrepresented. In contrast, male SMs who served in the Air Force were overrepresented ($z = 2.4$).

Discussion

Practical Implications

- ★ These findings highlight factors that may be associated with the risk of a service member attempting suicide during a military deployment.
- ★ This may provide opportunities for early identification of individuals at risk of suicide attempts and possible areas of research that may need to be further explored to enhance suicide prevention in military personnel.

Future Directions

- ★ Replicate analyses in larger data sets to address low base rate concerns
- ★ Examine factors that may explain identified sex-based differences (i.e., occupational stressors associated with careers requiring higher education and experiences unique to military branches that increase suicide risk)
- ★ Identify how resources can be made available to at risk-populations to reduce the likelihood of an aeromedical evacuations
- ★ Evaluate how the distribution of diagnoses may be reflective of clinically significant needs rather than simply indicating which groups are overrepresented or underrepresented (i.e., Male service members in the Army)
- ★ Explore factors impacting higher rates of adverse health outcomes among enlisted personnel in the Army

References

Straud, C. L., Moore, B. A., Hale, W. J., Baker, M., Gardner, C. L., Shinn, A. M., Cigrang, J. A., Litz, B. T., Mintz, J., Lara-Ruiz, J. M., Young-McCaughan, S., Peterson, A. L., & STRONG STAR Consortium (2020). Demographic and occupational risk factors associated with suicide-related aeromedical evacuation among deployed U.S. military service members. *Military Medicine*, 185(11-12), e1968–e1976. <https://doi.org/10.1093/milmed/usaa201>
Moore, B. A., Straud, C. L., Hale, W. J., Baker, M. T., Gardner, C. L., Judkins, J. L., Shinn, A. M., Savell, S. W., Cigrang, J. A., Mintz, J., Rouska, A., McMahon, C., Lara-Ruiz, J. M., Young-McCaughan, S., & Peterson, A. L. (2021). Post-9/11 service members: Associations between gender, marital status, and psychiatric aeromedical evacuations from combat zones. *Military Psychology*, 33(6), 436–445. <https://doi.org/10.1080/08995605.2021.1962192>

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