



Short Communication

Military status and alcohol problems: Former soldiers may be at greater risk

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HIGHLIGHTS

- Greater risk of alcohol problems for separated male soldiers than current soldiers.
- Former male soldiers at greatest risk for alcohol problems compared to civilian spouses.
- Providers should pay close attention to soldiers who separate from the military.

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ABSTRACT

Objectives: The goal of this study was to explore differences in alcohol problems as a function of military status (current soldier, previous soldier and civilian spouses), and the possible interaction between sex and military status. We hypothesized that 1) soldiers would be at greater risk for alcohol problems than civilian spouses, and 2) former soldiers would be at greater risk compared to current soldiers.

Methods: Data were drawn from Operation: SAFETY, a longitudinal study examining physical and mental health among U.S. Army Reserve and National Guard soldiers and their partners. The analytic sample included male and female participants who completed both the baseline and first follow-up assessments (N = 772). Negative binomial regression models were used to examine differences between military status group on alcohol problems at follow-up, controlling for sex and alcohol consumption at baseline. Interactions between military status and sex were also examined.

Results: Among current soldiers, males experienced significantly more alcohol problems compared to women (4.47, 3.46; p = 0.005). Likewise, among previous soldiers, males experienced significantly more alcohol problems compared to women (6.69, 2.92; p = 0.002). Male previous soldiers had significantly more alcohol problems compared to both male current soldiers and male civilian spouses (6.69, 4.47, p = 0.04; 6.69, 3.96; p = 0.02). Among women, there were no significant differences by military status.

Conclusions: Our results indicate that male previous soldiers are at greater risk of alcohol problems than both current soldiers and civilian spouses. Health care and service providers should consider screening and monitoring soldiers who separate from the military, as alcohol use may increase.

1. Introduction

Alcohol has a long and complicated history within military populations, being seen as both a risk factor and a tool for cohesion and coping; and is highly accepted within military culture (Jones & Fear, 2011). Approximately 11–15% of soldiers who experienced deployment to Iraq or Afghanistan endorse alcohol misuse (Milliken, Auchterlonie, & Hoge, 2007) and population-level evidence demonstrates that rates of heavy and binge drinking increased between 1990 and 2008 among US active duty personnel (Bray, Brown, & Williams, 2013). Compared to active duty soldiers, National Guard (NG) and reserve soldiers may be

at greater risk; those who experienced combat were more likely to engage in heavy weekly drinking, binge drinking, and have alcohol-related problems (Jacobson et al., 2008). This may be due to the qualitatively different experiences of NG/reserve soldiers, compared to active duty, and therefore, different stressors related to reserve participation, partly resulting from them being embedded within civilian rather than military communities, and therefore potentially having less support from the military institution (Castaneda et al., 2008; Griffith, 2011).

Whereas stress during military service (e.g. from combat/deployment) has been strongly related to alcohol consumption (Schumm &

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Table 1
Participant characteristics.

Variable	Full sample N = 772	Current soldiers N = 412	Previous soldiers N = 34	Civilian spouses N = 326
	% (N) or M (SD)	% (N) or M (SD)	% (N) or M (SD)	% (N) or M (SD)
Sex				
Male	49.48% (382)	83.50% (344)	47.06% (16)	6.75% (22)
Female	50.52% (390)	16.50% (68)	52.94% (18)	93.25% (304)
Race/ethnicity				
Non-Hispanic White	81.99% (633)	79.61% (328)	76.47% (26)	85.58% (279)
Non-Hispanic Black	4.27% (33)	5.58% (23)	5.88% (2)	2.45% (8)
Hispanic	6.87% (53)	8.25% (34)	11.76% (4)	4.60% (15)
Other	4.92% (38)	4.61% (19)	5.88% (2)	5.21% (17)
No response	1.94% (15)	1.94% (8)	0.00% (0)	2.15% (7)
Education				
< HS – HS grad	12.05% (93)	12.62% (52)	11.76% (4)	11.35% (37)
Some college	48.96% (378)	55.83% (230)	55.88% (19)	39.57% (129)
College +	38.99% (301)	31.55% (130)	32.35% (11)	49.08% (160)
Age	31.05 (6.61)	31.42 (6.35)	33.97 (6.91)	30.28 (6.80)
Relationship status				
Married	64.77% (500)	62.63% (270)	82.35% (28)	61.96% (202)
Cohabiting	35.23% (272)	34.47% (142)	17.65% (6)	38.04% (124)
Income	\$40,000 to \$59,999	\$40,000 to \$59,999	\$40,000 to \$59,999	\$40,000 to \$59,999
Years served	9.28 (5.93)	9.60 (5.96)	5.24 (3.55)	NA

Chard, 2012), it is possible individuals may also be at greater risk for alcohol problems after leaving military service. The transition out of military service has long been hypothesized as a stressor that may lead to adverse health consequences (McNeil & Giffen, 1967), including increased substance use, though, to date, there has been limited evidence for this hypothesis (Iversen et al., 2005). Soldiers who already accept alcohol use, as part of military culture, may become susceptible to more problematic use once they no longer need to moderate use to meet constraints of readiness for military duty, and this may persist long after the transition period itself. Indeed, evidence from other work suggests that leaving the military might lead to increased acceptance of substance use. For example, reserve soldiers who left the military with a traumatic brain injury had higher levels of approval for non-medical use of prescription drugs compared to current soldiers (Devonish et al., 2017). Furthermore, cross-sectional, nationally-representative data demonstrate that, compared to current reserve soldiers, soldiers who have separated from the military show higher rates of alcohol dependence and illicit drug dependence (Hoopsick, Fillo, Vest, Homish, & Homish, 2017). Finally, marijuana use, cigarette smoking, and non-medical use of prescription painkillers were found to increase after leaving the military among a limited sample of OEF/OIF veterans (Golub & Bennett, 2014).

In spite of these indications, there has been limited examination of the impacts of leaving military service on alcohol problems. Therefore, the goal of this study was to explore alcohol problems as a function of military status (current soldier, previous soldier and civilian spouse), among a sample of NG and Army Reserve soldiers. We hypothesized that there would be differences in alcohol problems between current and former soldiers and furthermore that 1) soldiers would be at greater risk than civilian spouses, and 2) former soldiers would be at greater risk compared to current soldiers. Given well-established differences in alcohol consumption between men and women, we also examined the possible interaction between sex and military status.

2. Material and methods

2.1. Participants and procedure

Data were drawn from Operation: SAFETY (Soldiers and Families Excelling Through the Years), a longitudinal study broadly focused on the health of NG/Reserve soldiers and their spouses. Detailed methods have been described elsewhere (Devonish et al., 2017; Heavey, Homish,

Goodell, & Homish, 2017; Vest, Heavey, Homish, & Homish, 2017), but briefly, US Army Reserve and Army NG soldiers and their partners were recruited over a 15 month period (Summer 2014 – Fall 2015) from units across New York State. Soldiers were screened on six inclusion criteria: (1) the couple is married/living as if married; (2) at least one member of the dyad is a current Army Reserve Soldier/NG Soldier; (3) the soldier is between the ages of 18 and 45; (4) both partners are able to speak and understand English; (5) both partners are willing and able to participate; and (6) both partners have had at least one alcoholic beverage in the past year.

The study team met with 47 units across New York State. This resulted in 1462 individuals (731 couples) eligible for the study. Of those, 572 (78%) agreed to participate and 83% of couples (N = 472) completed some part of the survey. Only surveys where both partners completed the entire survey were included for follow-up (N = 418).

Participants completed three online surveys (baseline with two yearly follow-ups) administered through StudyTrax™, a secure HIPAA-compliant online survey software. The State University of New York at Buffalo's Institutional Review Board as well as the Army Human Research Protections Office, Office of the Chief, Army Reserve as well as the Adjutant General of the National Guard approved the study protocol.

This analysis focuses on a subsample (N = 772 individuals) from the parent study comprising current soldiers (n = 412), previous soldiers (n = 34), and civilian spouses (n = 326) who completed the baseline and first follow-up assessments. Participant demographics are described in Table 1.

2.2. Measures

2.2.1. Alcohol problems

Alcohol use and problems were assessed at the first follow-up with the Alcohol Use Disorders Identification Test (AUDIT) (Babor & Del Boca, 1992). The AUDIT consists of 10 items rated on a 4-point scale from 0 (*Never*) to 4 (*Daily or almost daily*), with scores ranging from 0 to 40 ($\alpha_{\text{males}} = 0.76$; $\alpha_{\text{females}} = 0.80$). Items include things such as, “How often do you have a drink containing alcohol?”, and “Have you or someone else been injured because of your drinking?” Analysis used AUDIT total scores as the outcome.

2.2.2. Military status

Participants were asked at baseline to report whether they were ever

in the military and if so, whether they are currently serving. Responses were categorized into: Current Soldier, Previous Soldier, and Civilian Spouse.

2.2.3. Alcohol consumption

Alcohol consumption was measured at baseline as the quantity x frequency of past year alcohol use (Straus & Bacon, 1953). Higher scores indicate greater daily alcohol consumption in the past year.

2.2.4. Sex

Participants self-reported sex.

2.3. Analytic plan

The outcome was AUDIT scores, a limited range count variable; therefore, negative binomial regression models were used. This analysis returns Incident Rate Ratios (IRR), a measure of likelihood of experiencing alcohol problems at follow-up. The focal analysis examined differences in current alcohol problems at first follow-up based upon military status (current soldier, previous soldier, civilian spouses), controlling for participant sex and alcohol consumption at baseline. The model also examined the interaction between military status and sex. Predictive margins were generated to examine interaction effects. All analyses were conducted using Stata v.15 (Stata corp, College Station, TX).

3. Results

3.1. Descriptive statistics

The prevalence of clinically-significant alcohol problems (AUDIT ≥ 8) (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) at follow-up was 16.3% for current male soldiers, 25.0% for previous male soldiers, 27.3% for male civilian spouses and 7.4% for current female soldiers, 5.6% for previous female soldiers, and 6.9% for female civilian spouses. Mean (standard deviation (sd)) AUDIT scores were 4.4 (sd = 3.8) for current male soldiers, 6.9 (sd = 6.3) for previous male soldiers, 4.8 (sd = 3.5) for male civilian spouses and 3.1 (sd = 2.8) for current female soldiers, 2.9 (sd = 2.6) for previous female soldiers, and 3.2 (sd = 2.6) for female civilian spouses.

3.2. Focal analysis

In the adjusted negative binomial regression models, previous soldiers were 50% more likely than current soldiers to report alcohol problems (IRR: 1.50, 95% Confidence Interval (CI): 1.09, 2.06; $p = 0.013$) at follow-up. However, there was no difference in alcohol problems at follow-up between civilian spouses and current soldiers (IRR: 0.89, 95% CI: 0.66, 1.19; $p = \text{NS}$). Higher alcohol consumption at baseline predicted a 55% greater likelihood of alcohol problems at first follow-up (IRR: 1.55, 95% CI: 1.45, 1.67; $p < 0.001$). Compared to men, women experienced 23% fewer alcohol problems at follow-up (IRR: 0.77, 95% CI: 0.64, 0.94; $p = 0.009$).

There was a significant interaction between participant sex and military status ($F(2, 772) = 7.30$, $p = 0.03$) indicating that male previous soldiers had significantly more alcohol problems compared to both male current soldiers and male civilian spouses (6.69, 4.47, $p = 0.04$; 6.69, 3.96; $p = 0.02$) (Fig. 1). Among women, there were no significant differences between current soldiers, previous soldiers, and civilian spouses (Fig. 1). Among current soldiers, males experienced significantly more alcohol problems compared to women (4.47, 3.46; $p = 0.005$) (Fig. 1). Likewise, among previous soldiers, males experienced significantly more alcohol problems compared to women (6.69, 2.92; $p = 0.002$) (Fig. 1). There were no sex differences among civilian spouses.

4. Discussion

Our findings demonstrate that males who are no longer serving in the military are more likely to report alcohol problems than both current soldiers and civilian spouses. This adds support to other work that has demonstrated increased substance use among former soldiers (Golub & Bennett, 2014; Hoopsick et al., 2017) and increasing approval of substance use among former soldiers under certain conditions (Devonish et al., 2017). Whereas these other studies have documented cross-sectional differences (Hoopsick et al., 2017), or change over time among a specific subset of veterans (Golub & Bennett, 2014), our study demonstrates differences between current and former soldiers in a community sample of NG/Reserve soldiers. There were no differences in alcohol problems between current soldiers and civilian spouses. This indicates that it is specifically former soldiers who are at the greatest risk for alcohol problems, compared to both other groups.

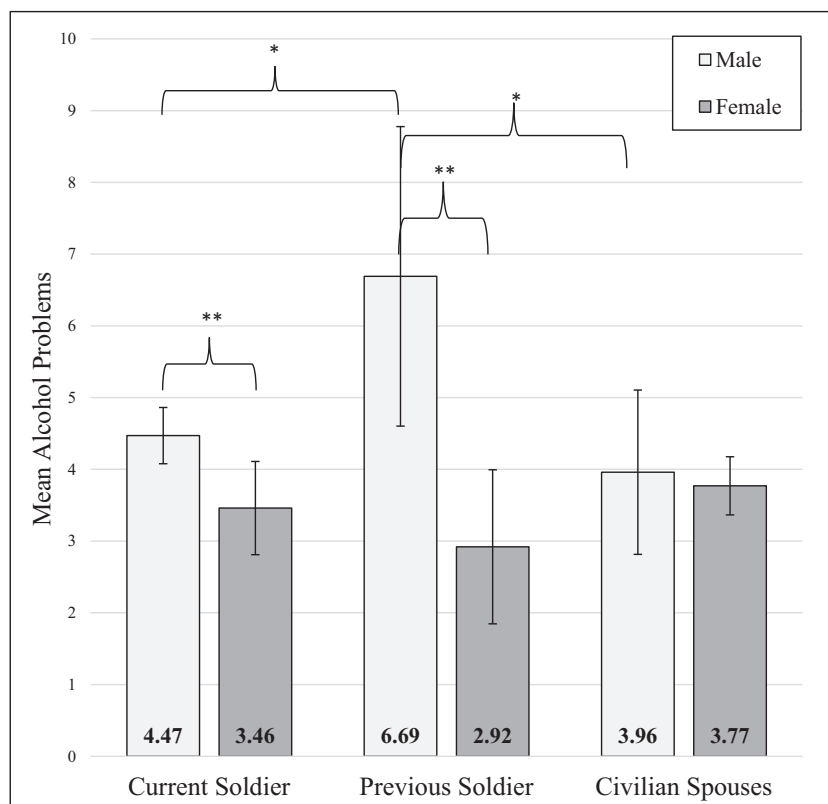
Combat experience has been demonstrated to be significantly related to alcohol problems (Bray & Hourani, 2007; Green, Beckham, Youssef, & Elbogen, 2014; Hoge, Auchterlonie, & Milliken, 2006; Wright, Foran, Wood, Eckford, & McGurk, 2012). Therefore, post-hoc analyses were used to examine if the differences found in alcohol problems between current and former soldiers were really due to differences in combat exposure. There was no difference in combat exposure among current vs. former male soldiers.

Alcohol use may increase after separation from the military for a number of reasons. Alcohol use is prevalent within the military (Bray et al., 2010; Bray & Hourani, 2007); once military participation ends and individuals no longer need to maintain military standards of readiness, drinking may have the potential to become more frequent and more problematic. Alcohol use may serve as a coping mechanism for dealing with previous military experiences and the challenges of the transition back to civilian life. Reintegration difficulties and military-related mental health concerns, such as PTSD, are well-documented correlates of substance use among veterans (e.g., Debell et al., 2014; Kline et al., 2014; Thomas et al., 2010). While our study was unable to assess changes in alcohol usage across time points due to the small number of participants who left military service during the study, it does demonstrate a greater risk for males who have separated from the military compared to those who are currently serving and compared to civilian spouses. Given previous research showing that civilian spouses of military members may also be at increased risk of alcohol problems (Blow et al., 2013; Lipari, Forsyth, Bose, Kroutil, & Lane, 2016; Vest, Cercone Heavey, Homish, & Homish, 2018), the fact that former soldiers experienced the greatest relative risk is significant.

Our results indicate that health and service providers should consider implementing processes to monitor soldiers after separation from the military as they may be at greater risk for alcohol problems. Regular screening for alcohol problems among former soldiers may help identify at-risk individuals and provide opportunities for early intervention. Additionally, prevention approaches that provide education around responsible alcohol use at the time of military discharge should be explored as possible ways to mitigate future problems.

4.1. Limitations

These findings must be interpreted within the context of study limitations. First, all data are self-report, and alcohol problems among participants were not clinically verified. However, this method is standard for gathering information of this type, and the AUDIT is a well-studied validated instrument for assessing problematic alcohol use. Second, the small sample of female soldiers may have limited our ability to detect differences among former and current female soldiers. Finally, data from this sample of Reserve/NG soldiers from New York State alone may not be generalizable to all military personnel or to active duty soldiers. Due to study eligibility criteria, all soldiers included in this study were married or living as if married, and therefore



*p<.05; ** p<.01

Fig. 1. Mean alcohol problems by sex and military status.

study findings may not be generalizable to single soldiers. Similarly, as civilian spouses of military personnel, findings may not be generalizable to civilians with no military connections. However, given literature documenting the increased risk of alcohol problems among military spouses generally, our findings that former soldiers are at greater risk compared to this population, demonstrates the importance of conducting further research on differences between individuals currently serving and those who have separated from military service. Future work should consider examining these relationships among other military samples. Additional years of data from this ongoing study will allow us to assess trends in alcohol problems during the period of transition as individuals separate from the military.

4.2. Conclusions

In conclusion, this work provides preliminary evidence that male soldiers who are no longer in the military may be at increased risk for problematic alcohol use, compared to current soldiers. Screening, treatment, and prevention approaches need to be explored to help prevent adverse substance-use related consequences among this population.

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Contributors

Dr. Homish and Ms. Homish conceived of, designed, and implemented the study. Dr. Fillo and Ms. Homish conducted the statistical analysis. Dr. Vest conducted the literature review and wrote the first draft of the manuscript, with sections contributed by Dr. Fillo and Ms. Homish. All authors critically reviewed the manuscript for content. All authors contributed to and approve the final manuscript.

Conflict of interest

No conflict declared.

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