

# Deployment-Related Military Sexual Trauma Predicts Heavy Drinking and Alcohol Problems Among Male Reserve and National Guard Soldiers

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**Background:** Military sexual trauma (MST) is associated with a range of deleterious mental and physical health consequences; however, far less attention has been paid to the associations between MST and negative health behaviors, such as substance abuse. This study examined 2 focal research questions: (i) What is the prevalence of experiencing MST during deployment among male Reserve and National Guard soldiers? and (ii) to what extent is the degree of MST exposure during deployment associated with frequent heavy drinking and alcohol problems postdeployment?

**Methods:** Data from male soldiers who had been deployed ( $N = 248$ ) were drawn from the baseline wave of Operation: SAFETY (Soldiers And Families Excelling Through the Years) an ongoing study examining health among U.S. Army Reserve and National Guard and their partners. Participants were recruited over a 15-month period (Summer 2014 to Fall 2015) from units in New York State. Deployments occurred prior to the baseline wave of the study. Analyses examined the relation between degree of MST exposure during soldiers' most recent deployment and (i) frequent heavy drinking and (ii) alcohol problems, measured at baseline, controlling for posttraumatic stress disorder symptoms and age.

**Results:** 17.3% of the male service members reported experiencing MST during their most recent deployment. Further, greater MST exposure was associated with a greater likelihood of engaging in frequent heavy drinking (adjusted risk ratio [aRR] = 1.03, 95% CI [1.01, 1.05]) and experiencing alcohol problems (aRR = 1.03, 95% CI [1.01, 1.06]) at baseline.

**Conclusions:** Findings demonstrate that MST rates are high among male Reserve and National Guard soldiers, and greater MST exposure is associated with an increased likelihood of engaging in frequent heavy drinking and experiencing alcohol problems among a population already at risk for problematic alcohol use.

**Key Words:** Military Sexual Trauma, Alcohol Problems, Frequent Heavy Drinking, Deployment.

THE VETERANS HEALTH ADMINISTRATION (VHA) uses the term "military sexual trauma" (MST) to refer to sexual harassment and/or sexual trauma experienced during the course of military service (U.S. Code, Title 38, §1720D). MST encompasses a wide range of uninvited or unwanted verbal or physical contact of a sexual nature, including attention, verbal remarks, touching, sexual coercion, sexual assault, and rape. A recent survey of 108,478 active duty service members across all branches of the U.S. military (Defense Manpower Data Center, 2013) found alarmingly high rates of MST-related experiences over the

prior 12 months, including experiencing crude or offensive behavior (41% of women, 20% of men), unwanted sexual attention (23% of women, 5% of men), sexually coercive behavior (8% of women, 2% of men), and unwanted sexual contact (including sexual touching and completed or attempted rape; 6% of women, 1% of men).

## Health Consequences of MST

A growing body of research demonstrates associations between MST and deleterious mental health conditions, including increased risk for posttraumatic stress disorder (PTSD), anxiety disorders, depression, and a range of physical health conditions (Kimerling et al., 2007, 2010; O'Brien and Sher, 2013; Walsh et al., 2014b), which in some cases can persist for more than a decade after the MST occurred (Street et al., 2007; Vogt et al., 2005). However, far less attention has been paid to the associations between MST and negative health behaviors that are particularly prevalent in military populations. Excessive drinking, in particular, is entrenched in military culture (Ames and Cunradi, 2004). Substance abuse is one of the most commonly reported health problems among military personnel, especially among those who have served in Iraq and Afghanistan (Seal et al.,

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2007, 2011). Indeed, more problematic forms of alcohol use (e.g., frequent heavy drinking) and their associated consequences have been shown to increase postdeployment among this cohort (Jacobson et al., 2008; Seal et al., 2011). Further, the risk of new-onset heavy drinking, binge drinking, and alcohol-related problems has been shown to increase postdeployment (Jacobson et al., 2008). With more than 2.6 million service members having deployed as part of the Global War on Terror, it is important for researchers and clinicians focused on this population to develop a greater understanding of the various risk factors related to this problematic alcohol use.

MST experienced during deployment may contribute to these increases in problematic drinking postdeployment. For example, victims may use alcohol as a form of self-medication to help them cope with painful thoughts and emotions associated with their MST experiences (Langdon et al., 2017; Stewart, 1996). Cross-sectionally, MST is associated with 2 to 3 times greater odds of having an alcohol or substance use disorder (SUD) diagnosis among VHA patients (Kimerling et al., 2007, 2010). Additionally, high proportions of veterans seeking treatment for SUDs report histories of interpersonal trauma (Ouimette et al., 2000). However, simply examining the presence or absence of a SUD diagnosis likely misses a great deal of MST-related problematic alcohol use, as well as important variability in the nature (e.g., quantity, frequency, duration) of that drinking. Additionally, this approach fails to consider other factors that may explain the common co-occurrence of MST and SUDs. For example, PTSD is highly comorbid with both SUDs (Jacobsen et al., 2001; Kessler et al., 1996) and MST (Kimerling et al., 2007, 2010; Suris and Lind, 2008).

#### *National Guard and Reserve Populations*

Prior research on the consequences of MST has heavily relied on medical records and surveys of active duty service members or veterans using VHA services; however, this approach misses a large and important proportion of the military who often do not have access to VHA care (i.e., Reserve/National Guard soldiers). Reserve and National Guard components constitute approximately 38.3% of the U.S. Armed Forces (Defense Manpower Data Center, 2017), yet only a few studies have focused specifically on their experience of MST (McCallum et al., 2015; Street et al., 2008; Walsh et al., 2014a,b). Additionally, there is evidence that these service members are at greater risk for a variety of problems compared to active duty military personnel postdeployment, including new-onset PTSD (Smith et al., 2008), need for mental health treatment (Milliken et al., 2007), and interpersonal problems (Milliken et al., 2007) including intimate partner violence (Heavey et al., 2017). Additionally, whereas excessive drinking is a widespread problem in the military, a recent meta-analysis found higher prevalence of SUDs among Reserve and National Guard service members compared to active duty (Cohen et al., 2015). Additionally,

Reserve and National Guard service members are at greater risk for increased and new-onset heavy drinking and associated problems postdeployment than active duty service members (Jacobson et al., 2008). Further, establishing precise MST prevalence estimates in this population is complicated by variations in the methodology and definition of MST used across the few existing studies. The present research will contribute to a greater understanding of the rates and potential correlates of MST among this under-examined population by measuring the full range of MST experiences that correspond to VHA criteria for MST, as well as their relation to negative health behaviors and associated problems, which are particularly prevalent in this population.

#### *Gender Differences in MST*

Research on sexual harassment and sexual assault, both within and outside of military contexts, has predominantly focused on women. However, the risk of exposure to MST is also high among men (Kimerling et al., 2007); men are the victims of approximately 60% of annual sexual assaults in the active duty military (Morrall et al., 2015). Additionally, much less is understood about the nature and consequences of MST for male service members. This is partially due to the fact that sexual assault is the most underreported violent act in the United States (Rennison, 2002), and men are less likely than women to report incidents to authorities (Morrall et al., 2015). Indeed, approximately two-thirds of men in the military fail to report sexual assault experienced during their military career (Morrall et al., 2015).

Additionally, there are important differences in the nature of the harassment and assault men and women typically experience, which may have implications for the nature and severity of MST-related consequences. Whereas sexual assault against both men and women is most commonly perpetrated by men (Sadler et al., 2003; Waldo et al., 1998), research on MST among active duty service members has found that men are more likely than women to be victims of repeated, physically violent assaults, often committed by multiple assailants (Morrall et al., 2015). Additionally, prior research suggests that there may be differences in the motivations behind MST perpetrated against men and women. For example, men are more likely than women to be the target of vulgar comments that reinforce gender role stereotypes, particularly a heterosexist hypermasculinity (Stockdale et al., 1999; Street et al., 2007). Indeed, attacks against men are more often described as being intended to abuse or humiliate them, whereas attacks against women are more often described as more purely sexual in nature (Morrall et al., 2015). Further, multiple studies have found that MST can have a more negative impact on men's mental and physical health in certain contexts (Magley et al., 1999; Shipherd et al., 2009; Street et al., 2007; Vogt et al., 2005). For example, 1 study found that at higher levels of sexual harassment, men report more depression and poorer general mental health than women (Street et al., 2007). Fortunately, there

has been growing attention in recent years to the need for more research focusing on men's experience of MST and how it may differ from women's (Allard et al., 2011; Hoyt et al., 2011; Mondragon et al., 2015; Street et al., 2007). In order to effectively respond to this important public health issue, research specifically focusing on MST among men is needed to develop a greater understanding of the nature and consequences of their experiences.

### Present Research

The prevalence of MST and its associated consequences represents an important public health issue. However, more research is needed to better understand the prevalence of MST specifically among men and the extent to which it relates to the negative health behaviors particularly prevalent among Reserve and National Guard service members post-deployment. The present research aims to fill these critical gaps in the literature by examining 2 focal research questions: (i) What is the prevalence of experiencing MST, as defined by VHA criteria, during deployment among male Reserve and National Guard service members? and (ii) to what extent is the degree of MST associated with 2 issues that are particularly prevalent in this population postdeployment—frequent heavy drinking and alcohol problems? These questions were examined in a sample of married, male service members, a population that constitutes the largest proportion of the U.S. Armed Forces (Office of the Deputy Assistant Secretary of Defense for Military Community and

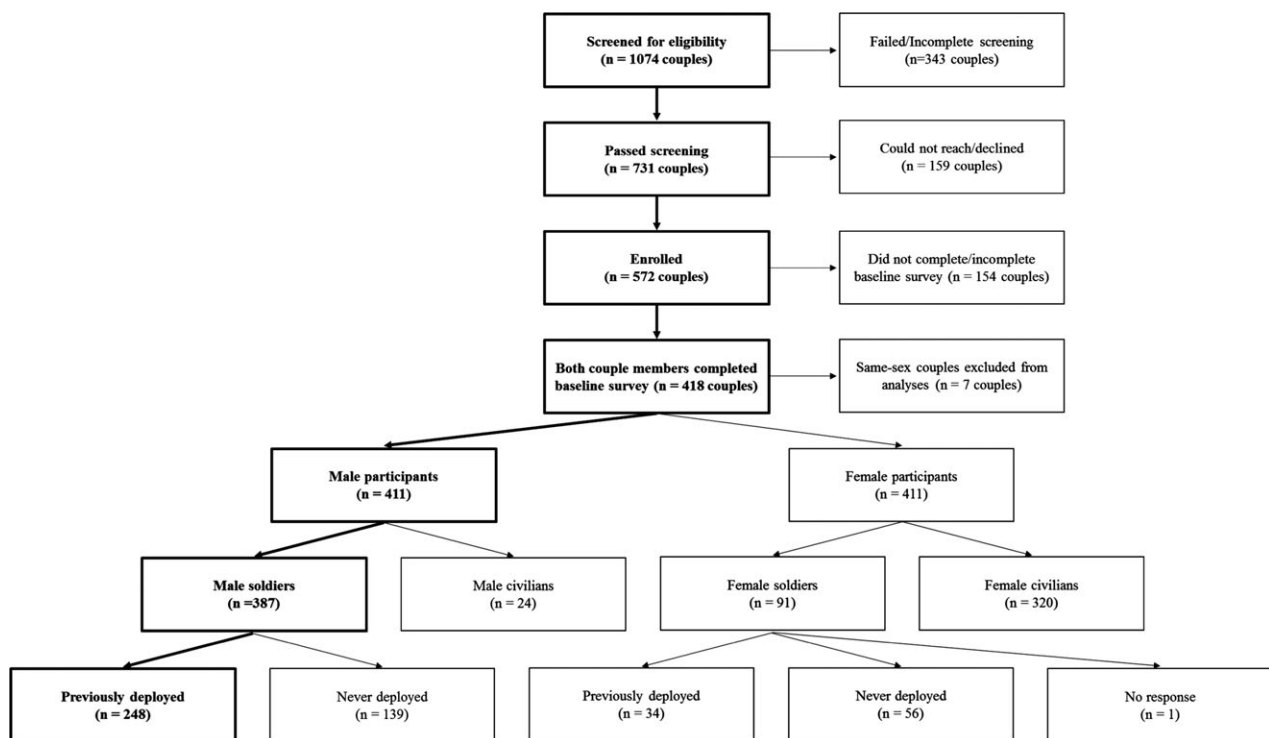
Family Policy, 2015). We hypothesize that greater MST exposure during the most recent deployment will be associated with more frequent heavy drinking and greater alcohol problems postdeployment.

## MATERIALS AND METHODS

### Participants and Procedure

Data for the present research were drawn from Operation: SAFETY (Soldiers And Families Excelling Through the Years), an ongoing study examining the health and well-being of U.S. Army Reserve and National Guard soldiers and their partners over time (Devonish et al., 2017; Heavey et al., 2017; Kozlowski et al., 2017; Vest et al., 2017). Participants were recruited over a 15-month period (Summer 2014 to Fall 2015) from units across New York State. Participants were screened on 6 inclusion criteria: (i) The couple is married or living as if married; (ii) 1 partner is a current U.S. Army Reserve and National Guard soldier; (iii) the soldier is age 18 to 45; (iv) both partners speak and understand English; (v) both partners are willing and able to participate; and (vi) both partners have had at least 1 alcoholic beverage in the past year. Participants completed 3 online surveys (baseline with 2 yearly follow-ups) administered through a secure, Health Insurance Portability and Accountability Act (HIPAA)-compliant online survey programming software, StudyTrax™ (StudyTrax, Macon, GA), which allowed for data encryption. Each participant received a \$60 check for completing the baseline survey. The protocol was approved by the University at Buffalo Institutional Review Board, the Army Human Research Protections Office, Office of the Chief, Army Reserve, and the Adjutant General of the National Guard.

Participant flow through the study is presented in Fig. 1. Screening of 47 units resulted in 731 eligible couples. Of those, 572 couples (78%) agreed to participate and 418 couples (83%) had both couple



**Fig. 1.** Participant flow through for Operation: SAFETY, a study of health among U.S. Army Reserve and National Guard soldiers and their spouses. The sample for the present analyses was comprised of 248 male soldiers who had been previously deployed at the time of the baseline assessment. The sample of previously deployed female soldiers ( $n = 34$ ) was too small to be included in analyses.

members complete the baseline survey. The only significant difference between those that were eligible and enrolled versus those who were eligible and did not enroll occurred when a civilian partner screened for the study ( $n = 11$ ) they were less likely to enroll ( $p < 0.001$ ). Given that the nature of the main study was to examine spousal influence, only surveys where both partners completed the entire survey were included for follow-up ( $N = 418$ ); however, there were no differences between complete couples and incomplete couples on alcohol use, PTSD, or MST. Additionally, a small number of same-sex couples ( $n = 7$ ) were excluded from present analyses.

The sample for the present work is composed of 248 male soldiers who had been previously deployed at the time of the baseline survey. Sample characteristics are presented in Table 1. The majority of the sample is non-Hispanic White (81.1%), with at least some college education (60.1%) or a college degree (25.8%). The median household income bracket is \$60,000 to \$79,000. The average age of participants was 33.39 ( $SD = 6.18$ ) years. Most soldiers were married (75.4%), with the remainder living as if married. Soldiers had served an average of 11.93 years ( $SD = 5.92$ ) and had been deployed an average of 1.65 times ( $SD = 0.92$ ).

### Measures

**Military Sexual Trauma.** MST experienced during soldiers' most recent deployment was measured retrospectively at baseline using the sexual harassment subscale of the Deployment Risk and Resilience Inventory-2 (Vogt et al., 2012). This subscale is comprised of 8 items examining soldiers' experiences of unwanted sexual contact or verbal conduct of a sexual nature during deployments (see Fig. 2). These exposures resulted from contacts with other unit members, commanding officers, or civilians in the warzone. Example items include "Made crude and offensive sexual remarks directed at me, either publicly or privately," "Used a position of authority to pressure me into unwanted sexual activity," and "Physically forced me to have sex." Items are rated on a 4-point scale ranging from 0 (*Never*) to 3 (*Many times*). The scale has high internal consistency ( $\alpha_{\text{men}} = 0.93$ ). Items were summed to create a total MST exposure score with an overall range of 0 to 24.

**Frequent Heavy Drinking.** Consistent with other work (Homish and Leonard, 2007), current frequent heavy drinking was assessed using the maximum report of 2 items: (i) the reported frequency of getting drunk in the past year, ranging on a 9-point scale from 1 (*Never*) to 9 (*Every Day*), and (ii) the frequency of 5 or more drinks

in a single setting in the past year, ranging on a 9-point scale from 1 (*Never*) to 9 (*Every day*).

**Alcohol Problems.** Current experience of alcohol problems was assessed using the Alcohol Use Disorders Identification Test (AUDIT; Babor and Del Boca, 1992). This measure consists of 10 items rated on a 5-point scale from 0 (*Never*) to 4 (4 or more times a week). Items are summed to create a total score with an overall range from 0 to 40 ( $\alpha_{\text{men}} = 0.76$ ). Example items include "Have you or someone else been injured because of your drinking?" and "How often during the last year have you had a feeling of guilt or remorse after drinking?"

**Covariates.** Covariates included current PTSD symptoms and age. PTSD symptoms were measured using the PTSD Checklist, which has been updated based upon DSM-5 criteria (Bovin et al., 2015). This is a 20-item self-report measure of PTSD symptoms over the past month. Each response is rated on a 5-point scale ranging from 0 (*Not at all*) to 4 (*Extremely*), with an overall range of 0 to 80 and greater scores indicating greater severity of PTSD symptoms. It has demonstrated good psychometric properties in previous research (Bovin et al., 2015), and internal consistency in the present sample was high ( $\alpha_{\text{men}} = 0.95$ ). Soldier age was calculated in years by subtracting the participant's date of birth from the assessment date.

### Analytic Method

Descriptive statistics were used to characterize the variables. Analyses examined the extent to which the degree of MST exposure during soldiers' most recent deployment was associated with 2 current alcohol use outcomes: frequent heavy drinking and alcohol problems. Frequent heavy drinking and alcohol problems were count variables; therefore, negative binomial regression models were used. These analyses return a risk ratio (RR), which measures the increased likelihood of frequent heavy drinking and experiencing alcohol problems for every 1 unit increase in MST exposure. A second set of models adjusted for the effects of PTSD symptoms and soldier age. PTSD is highly comorbid with both SUDs (Jacobsen et al., 2001; Kessler et al., 1996) and MST (Kimerling et al., 2007, 2010; Suris and Lind, 2008). We controlled for age because older soldiers have had more opportunity to be deployed and potentially experience MST.

## RESULTS

### Preliminary Analyses

**Descriptive Statistics.** Frequent heavy drinking occurred, on average, about once per month in the past year ( $M = 2.56$ ,  $SD = 1.42$ , range 1 to 9); however, 8.6% of participants reported heavy drinking weekly or more in the past year. The average AUDIT score was 5.07 ( $SD = 3.99$ ), with 19.0% ( $N = 47$ ) of participants meeting criteria ( $AUDIT \geq 8$ ) for experiencing clinically significant alcohol problems. Two covariates were examined in the adjusted models: PTSD symptoms ( $M = 10.38$ ,  $SD = 11.82$ ) and soldier age ( $M = 33.39$  years,  $SD = 6.18$ ).

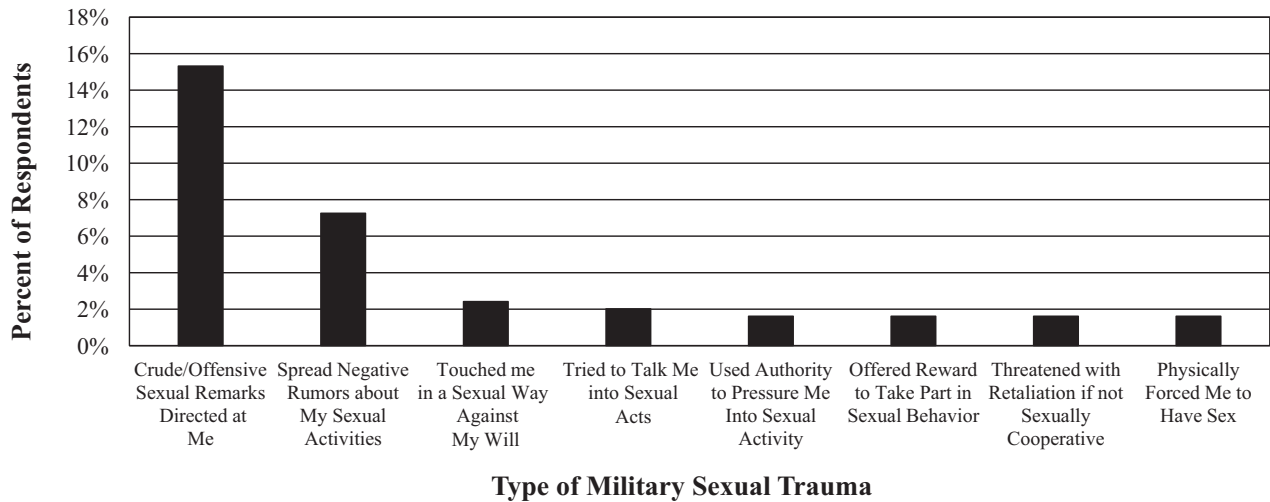
### Focal Analyses

**Prevalence of MST.** MST was common among the male soldiers in this sample; 17.3% ( $N = 43$ ) reported at baseline

**Table 1.** Demographic Characteristics of Male U.S. Army Reserve and National Guard Soldiers ( $N = 248$ )

Variable	% (N) or M (SD)
Race/ethnicity	
Non-Hispanic White	81.1 (201)
Non-Hispanic Black	4.4 (11)
Hispanic	9.7 (24)
Other	3.2 (8)
Education	
<HS-HS graduate	14.1 (35)
Some college	60.1 (149)
College +	25.8 (64)
Age	33.39 (6.18)
Relationship status	
Married	75.4 (187)
Cohabiting	24.6 (61)
Income	\$60,000 to \$79,999
Years served	11.93 (5.92)
Number of deployments	1.65 (0.92)
Years since last deployment	4.72 (3.07)





**Fig. 2.** Prevalence of types of military sexual trauma experienced by male U.S. Army Reserve and National Guard soldiers during their most recent deployment.

having experienced some form of MST during their most recent deployment. Figure 2 illustrates the 8 different kinds of MST assessed. Of these, crude/offensive remarks were most common; 15.3% ( $N = 38$ ) of soldiers experienced such remarks at least once or twice. Additionally, 1.6% ( $N = 4$ ) of soldiers reported having been physically forced to have sex.

*Frequent Heavy Drinking.* In unadjusted models, greater MST exposure during the most recent deployment was associated with greater likelihood of frequent heavy drinking for male soldiers at baseline (RR: 1.03, 95% CI [1.01, 1.05]; see Table 2). This relationship held in the adjusted models, with greater MST exposure once again being associated with greater likelihood of frequent heavy drinking at baseline (aRR: 1.03, 95% CI [1.01, 1.05]), controlling for PTSD symptoms and soldier age. Additionally, PTSD symptoms (aRR: 1.00, 95% CI [1.00, 1.01]) and soldier age (aRR: 0.99, 95% CI [0.98, 1.00]) were unrelated to frequent heavy drinking.

*Alcohol Problems.* In unadjusted models, greater MST exposure was associated with a greater likelihood of experiencing alcohol-related problems among male soldiers at

baseline (RR: 1.04, 95% CI [1.01, 1.07]; see Table 2). This relationship held in the adjusted models, with greater MST exposure once again being associated with greater likelihood of experiencing alcohol-related problems at baseline (aRR: 1.03, 95% CI [1.01, 1.06]), controlling for PTSD symptoms and soldier age. Higher PTSD symptoms (aRR: 1.01, 95% CI [1.01, 1.02]) were associated with greater likelihood of experiencing alcohol problems at baseline; however, soldier age (aRR: 0.99, 95% CI [0.97, 1.00]) was unrelated to the likelihood of experiencing alcohol problems at baseline.

DISCUSSION

The present research examined the prevalence of MST among male Reserve and National Guard soldiers and examined the relations between the degree of MST exposure and later frequent heavy drinking and alcohol problems. Results revealed high rates of MST among male Reserve and National Guard soldiers during their most recent deployment. Further, the degree of exposure to MST was associated with greater likelihood of engaging in frequent heavy drinking and experiencing alcohol problems at baseline.

**Table 2.** Negative Binomial Regression Analyses Examining Military Sexual Trauma (MST) as a Predictor of Frequent Heavy Drinking and Alcohol Problems Among Male U.S. Army Reserve and National Guard Soldiers

	Frequent heavy drinking RR [95% CI]		Alcohol problems RR [95% CI]	
	Unadjusted	Adjusted	Unadjusted	Adjusted
MST	1.03** [1.01, 1.05]	1.03* [1.01, 1.05]	1.04** [1.01, 1.07]	1.03* [1.01, 1.06]
PTSD symptoms		1.00 [1.00, 1.01]		1.01*** [1.01, 1.02]
Soldier age		0.99 [0.98, 1.00]		0.99 [0.97, 1.00]

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .  
PTSD = posttraumatic stress disorder.

The present findings provide valuable information about the prevalence of MST among male Reserve and National Guard soldiers, who remain understudied in the literature. Specifically, 17.3% of participants reported experiencing MST during their most recent deployment. Whereas this is higher than previous estimates of MST among male Reserve and National Guard service members (Walsh et al., 2014a, b), the lifetime prevalence of MST in this population is likely even higher. The present estimates are based on MST experienced during the most recent deployment; however, the participants had been deployed an average of 1.65 times, which is on par with the national average for post-9/11 deployments ( $M = 1.72$ ; Institute of Medicine, 2013). Additionally, MST may occur in other nondeployment settings (e.g., weekend drills, training), which would further increase the lifetime MST burden.

The present research also makes an important contribution to the MST literature by focusing on male Reserve and National Guard soldiers. The Reserve and National Guard components make up a sizable proportion of the military (38.3%; Defense Manpower Data Center, 2017). Further, there is evidence that these service members experience more problems than active duty military personnel postdeployment, including higher rates of SUDs (Cohen et al., 2015), new-onset heavy drinking (Jacobson et al., 2008), new-onset PTSD (Smith et al., 2008), need for mental health treatment (Milliken et al., 2007), and interpersonal problems (Milliken et al., 2007) including intimate partner violence (Heavey et al., 2017). However, large-scale studies of MST have disproportionately relied on samples of active duty service members or veterans utilizing VHA services, therefore failing to adequately capture the experiences of those in Reserve and National Guard components, who often lack access to VHA care.

This research contributes to the growing literature on the negative effects of MST for service members. Elevated alcohol use and associated problems constitute the most common health problem among veterans of Iraq and Afghanistan, particularly for those in Reserve and National Guard components (Jacobson et al., 2008; Seal et al., 2011). Our findings suggest that MST may contribute to both frequent heavy drinking and alcohol problems postdeployment and that these relations hold even after controlling for PTSD symptoms. Although speculative, this pattern of elevated alcohol problems may suggest that soldiers are attempting to self-medicate or drinking to cope with their MST experiences (Langdon et al., 2017). Drinking to cope is a particularly maladaptive behavior; prior research has shown that drinking to cope is associated with more alcohol problems than can be explained by the amount of alcohol consumed (Cooper et al., 2016). However, additional research is needed to confirm this suspicion with respect to victims of MST specifically.

Clinically, the present findings can serve to inform screening and intervention efforts for victims of MST across all components of the military, particularly among Reserve and

National Guard service members. Namely, these findings underscore the need for better and more systematic screening of Reserve and National Guard service members for MST and related conditions. Currently, the vast majority of these efforts are organized through the VHA, who implemented universal MST screening for any veteran seen for inpatient or outpatient care in 2002. For those who screen positive, treatment for all MST-related conditions is provided free of charge, regardless of eligibility or co-pay status. These efforts have proven effective in increasing subsequent mental health treatment among patients who screen positive for MST (Kimerling et al., 2008). However, Reserve and National Guard service members often lack access to VHA services given the healthcare eligibility requirements (e.g., length of combat active duty service; Veterans Benefits Administration, 2012). Further, Reserve and National Guard service members are not the only ones being missed by this approach; less than half of all eligible veterans are enrolled for VHA care (e.g., 42% in 2014), and only approximately 64% of those enrolled receive treatment in a given year (Bagalman, 2014). Thus, seeking treatment for MST and related conditions among Reserve and National Guard soldiers presents a considerable healthcare access issue. It is critical to discover new and effective methods for finding and treating this population. Given their limited access to VHA care, it may be more feasible to identify and treat MST victims from Reserve and National Guard components through civilian healthcare providers.

The present research revealed an association between MST and both frequent heavy drinking and alcohol problems commonly experienced by service members postdeployment. However, the potential negative effects of MST are unlikely to stop with alcohol problems or with service members themselves. Alcohol misuse, and substance use more generally, is commonly comorbid with a range of mental health disorders, including PTSD, anxiety, and depression (Jacobson et al., 2008; Stein et al., 2017; Tanielian and Jaycox, 2008). Additionally, the service members' alcohol problems are likely to negatively impact their spouses and families as well. Above and beyond the strain that deployment and military life can generally place on marriages (Gewirtz et al., 2010; Karney and Trail, 2016) hazardous drinking among National Guard service members postdeployment has been shown to be associated with greater marital distress postdeployment (Blow et al., 2013). Whereas there is limited research specifically examining the effects of service member drinking on children, the role of alcohol misuse in disrupting family functioning is well established among civilian populations. Taken together, MST and associated alcohol problems are likely to have negative influences on the entire family system.

#### *Strengths, Limitations, and Future Directions*

The present research has several notable strengths. First, the results demonstrate that MST exposure is associated with

problematic alcohol use years after the experience. The present research also makes an important contribution to our understanding of the correlates of MST among 2 important and understudied populations: National Guard and Reserve and male service members. Additionally, by collecting information about MST through confidential surveys, we were likely able to more accurately estimate the prevalence of deployment-related MST among male service members, who are particularly unlikely to formally report these incidents.

The present research also has some limitations that warrant discussion. This research examined MST in the context of the most recent deployment, which likely missed individuals who may have experienced MST in nondeployment military contexts and who may still be experiencing consequences. Additionally, we did not have precise information regarding the amount of time since the MST occurred, which may be important given that the effects of trauma tend to attenuate over time, nor information on any alcohol misuse or related problems that may have existed prior to deployment or military service. Whereas frequent heavy drinking and alcohol problems were measured after the deployment in which the MST occurred, the nature of the MST was retrospectively assessed at the same time as the alcohol use variables. Thus, it is possible that other factors may account for the associations between MST and frequent heavy drinking and alcohol problems. For example, there may be common factors that put an individual at greater risk for experiencing MST as well as heavy drinking and associated problems, or existing alcohol use/misuse may put service members at risk of experiencing MST. Prospective longitudinal research tracking soldiers across the deployment cycle is needed to tease apart the potential alternative explanations.

Additionally, female service members were excluded from the analyses. The number of women in the sample who had been deployed was quite small, but the overall proportion deployed is consistent with other work. More research examining MST simultaneously among men and women is needed so that direct comparisons of prevalence, sequelae, and risk/protective factors can be made (e.g., Walsh et al., 2014a,b). Further, all participants were either married or living as married, which may limit generalizability; however, the majority (56.0%) of male U.S. service members are married (Office of the Deputy Assistant Secretary of Defense for Military Community and Family Policy, 2015). Finally, whereas the present research begins to provide valuable information about the prevalence and correlates of MST for male National Guard and Reserve soldiers, the sample size is small for establishing the prevalence of MST in this population. Therefore, these findings need to be replicated with larger samples of National Guard and Reserve service members. However, the present sample is representative of National Guard and Reserve service members nationally in terms of race/ethnicity, gender breakdown, and deployment history.

## CONCLUSION

The present research demonstrates that deployment-related MST is highly prevalent among male Reserve and National Guard soldiers and greater MST exposure is associated with greater likelihood of both frequent heavy drinking and experiencing alcohol problems years after the event(s). Our findings suggest that MST may contribute to one of the most common health problems among recent veterans, particularly in the Reserve and National Guard. The high incidence of MST found in the current sample underscores the need for more systematic screening and interventions for MST and related problems aimed at Reserve and National Guard service members, as well as screening for problematic alcohol use among this population.

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