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Short Communication

Risky sexual behavior in Veterans seeking substance use and mental health treatment

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ABSTRACT

Veterans in the United States are at an elevated risk for substance use and risky sexual behaviors, either of which may function as coping responses to trauma exposure. The current study examined risky sexual behaviors in a sample of Veterans seeking therapy to reduce substance use behaviors and mental health symptoms as part of a larger randomized controlled trial. Self-report measures assessed substance use behaviors, PTSD, and risky sexual behaviors. Veterans ($N = 834$) were mostly male (93.4 %) and White (71.6 %) with an average age of 48.25 years. In the past 30 days, 50.5 % of Veterans had sex and 57.3 % of Veterans reported at least one day of heavy drinking. Among Veterans who had a regular sexual partner, 84.9 % did not always use a condom, whereas 77.1 % of Veterans who had a casual partner did not always use a condom. Of Veterans who endorsed sex in the past month, 49 % had a sexual encounter while intoxicated from alcohol and/or drugs, an outcome that was significantly associated with heavy drinking via multiple regression analysis. Nevertheless, other forms of risky sexual behavior (i.e., number of sexual partners and condom use) were not significantly associated with heavy drinking. Further, risky sexual behaviors were not directly associated with PTSD symptoms. Findings suggest that despite the high prevalence of risky sexual behaviors, these behaviors among this sample of treatment-seeking Veterans may be explained by other unexplored factors. Future research is necessary to explore alternative explanations for these behaviors to inform interventions.

1. Introduction

Veterans in the United States (US) are at an elevated risk for trauma exposure and substance use (e.g., Simons et al., 2018; Wright et al., 2013). While the relation between alcohol use and trauma symptoms has been widely examined among Veterans (e.g., Cancio, 2020; Livingston et al., 2020; Tripp et al., 2021), relationships with sexual health remains understudied. Initial research on sexual behaviors and related health practices (Forkus et al., 2021) identified risky sexual behaviors (RSBs) to be highly prevalent among Veterans vs. civilians (Albright et al., 2019; Evans et al., 2017; Lehavot et al., 2014). Alcohol use is not only associated with RSBs (Cook et al., 2006) but also highly prevalent among Veterans (e.g., Kelley et al., 2013; Kelsall et al., 2015). Thus, RSBs and alcohol use are critical when considering Veterans' sexual health.

RSBs refer to behaviors associated with adverse health outcomes such as sexually transmitted infections (STIs) and unplanned pregnancies (Meyers et al., 2008). RSBs appear more common among Veterans who use alcohol in sexual situations (e.g., Cook et al., 2006; Lehavot et al., 2016; Rodriguez et al., 2023). Further, heavy drinking (i.e., five

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drinks a day for men, four for women; NIAAA, 2023) is also associated with poor outcomes (e.g., Jacobson et al., 2008; Stahre et al., 2009). This is presumably due to alcohol's effect on inhibition, affecting decisions to have unprotected sex and/or have sex with multiple partners (Combellick et al., 2019). Given the high prevalence of STIs and RSBs among Veterans, attention is warranted to understand their association (Boyer et al., 2021).

Posttraumatic stress disorder (PTSD) symptoms are also important to holistically understand engagement in and function of RSBs among Veterans. RSBs are associated with various types of traumatic experiences such as sexual assault (Littleton et al., 2014), intimate partner violence (Cavanaugh et al., 2010), and negative outcomes for interpersonal relationships (Mirzaei et al., 2016). PTSD and trauma histories have been linked to engagement in risky behaviors broadly (e.g., Danielson et al., 2009; James et al., 2014; Strom et al., 2012), and increases in RSBs (e.g., Mota et al., 2018). Recent work (Blais et al., 2023) has found that higher alcohol use mediated the relation between PTSD and sexual risk taking in Veterans. Difficulties with emotion regulation have also been found to mediate this relationship (Weiss et al., 2019) suggesting not only that drinking and RSBs may function as efforts to cope with distress but also that considerable distress is experienced by individuals with PTSD. How these interrelationships may interact among Veterans seeking substance use treatment is therefore an important inquiry. Further, the prevalence of RSBs among such Veterans is unknown. Thus, the relation between trauma and RSBs needs to be further examined (Clancy et al., 2006; Freedy et al., 2010).

We need to address the sexual health needs of US Veterans to prevent RSBs and inform related psychosocial and behavioral treatments. The current study, therefore, aims to test if higher PTSD symptoms and alcohol use may be associated with higher RSBs among US Veterans. As we expect the relationship between alcohol use and RSBS to be more strongly positive by higher PTSD symptoms, we also explored potential interactive effects of PTSD and alcohol use. We will also explore the prevalence of RSBs among US Veterans presenting to mental health and substance use clinics.

2. Material and methods

2.1. Participants and procedures

Veterans initiating or receiving treatment at a Midwestern VHA hospital were recruited from mental health and substance use clinics via posters and presentations for a RCT focused on reducing substance use behaviors and aggression (see Chermack et al., 2019 for details). To be eligible, Veterans had to have recent substance use. They were approached, and informed of the study and, if interested, provided written informed consent and completed self-report screening surveys. Exclusion criteria covered suicidal ideation or symptoms of active thought disorders, inability to engage in the consent process due to cognitive/substance-associated factors, residing outside of the VHA service area, present enrollment in another mental health study, or being unable to read or speak English. Participants received $10 gift certificates for completing the initial screening. The VHA's institutional review board approved study procedures.

2.2. Measures

2.2.1. Demographics

Demographic information including age and race was collected via a self-report measure. Sex was obtained via chart review during the recruitment period. Limited variation in sample characteristics necessitated race to be recoded as White and non-White for our analyses.

2.2.2. Heavy drinking

The Substance Abuse Outcomes Module's alcohol item (Smith et al., 1996) assessed the frequency of heavy drinking (≥5 standard drinks in a day for men, ≥ 4 for women; NIAAA, 2023) during the last 30 days; potential response options were 0–30. For analysis, we transformed responses into a percentage of 30 days.

2.2.3. PTSD symptoms

The 17-item Posttraumatic Stress Disorder Checklist-Civilian (PCL-C; Weathers et al., 1993) assessed PTSD symptoms derived from *DSM–IV–TR* (American Psychiatric Association, 2000) diagnostic criteria. Responses range from 1 (*not at all*) to 5 (*extremely*) bothered by the symptoms in the past month. The PCL-C has demonstrated acceptable test–retest reliability (r range 0.75-0.88), internal consistency (α range 0.65-0.96), and convergent validity (Wilkins et al., 2011). Item 17 (exaggerated startle) was accidentally omitted from the materials; data were imputed using mean PCL-C scores in because it produces less biased estimates compared to other approaches (e.g., item mean substitution, regression imputation; Roth et al., 1999). Items were summed and the total score used in analyses. In our sample with this measure, we reported excellent internal consistency, α = 0.95.

2.2.4. Risky sexual behaviors

Past-month engagement in RSBs were evaluated with four modified questions derived from previous survey research (Centers for Disease Control and Prevention, 2011; Darke et al., 1991). Questions asked about number of sexual partners (0 = *None*, 1 = *1*, 2 = *2*, 3 = *3 to 5*, 4 = *6 to 10*, 5 = *More than 10 people*), condom use with regular/casual partners (among Veterans who reported regular or casual partners; 1 = *Every time*, 2 = *Often*, 3 = *Sometimes*, 4 = *Rarely*, 5 = *Never*), and sex while intoxicated from alcohol/other drugs (among Veterans who had sex; 0 = *No, I had sex at least 1 time in the last 30 days, but I was never drunk/high at the time*, 1 = *Yes, I had sex at least 1 time in the last 30 days while I was drunk/high*). Asking about sexual partners and condom use are gold standards of operationalizing RSB (Mercer, 2010) and assessing sexual intercourse while under the influence of substances is critical for evaluating RSBs in the context of substance use (Chawla & Sarkar, 2019).

Table 1
Descriptive statistics on individual characteristics and sexual behaviors over the past 30 days (N = 834).

Characteristic	% (*n*) or *M* (*SD*)
Age	48.25 (13.33)
Male	93.4 % (779)
White	71.6 % (597)
Employed	24.2 % (202)
# of binge drinking days in past 30 days	8.92 (11.26)
PTSD symptom score	45.08 (11.26)
Past 30-day risky sexual behaviors	
# of sexual partners	
0	49.0 % (411)
1	40.5 % (340)
More than 1	10.0 % (83)
Frequency of condom use with regular partner (n = 395)a	
Every time	15.2 % (60)
Often	4.3 % (17)
Sometimes	2.8 % (11)
Rarely	4.6 % (18)
Never	73.2 % (289)
Frequency of condom use with casual partner (n = 222)[b]	
Every time	23.0 % (51)
Often	6.3 % (14)
Sometimes	4.1 % (9)
Rarely	7.7 % (17)
Never	59.0 % (131)
Sex while intoxicated from alcohol/other drugs (n = 401)[c]	49.4 % (198)

Note. N = 834. PTSD = posttraumatic stress disorder. [a]Sample restricted to Veterans who endorsed having a regular partner. [b]Sample restricted to Veterans who endorsed having casual partners. [c]Sample restricted to Veterans who endorsed having sex in the past month.

See footnote of Table 1 for details on the sample restrictions.

2.3. Data Analytic Plan

Means and percentages were used to characterize demographic characteristics, sexual behaviors, and mental health symptoms. Ordinal regression analyses were used to model the number of sexual partners and condom use with regular and casual partners within three separate analyses. Logistic regression was used to model sexual encounters while intoxicated. In all four models, direct effects of demographic variables, PTSD symptoms, and heavy drinking were included as independent variables, with the interactive effect of PTSD and heavy drinking added in subsequent models for eight total models. Adjusted and Nagelkerke R^2 characterized the magnitude of identified effects. Analyses were run in SPSS.

3. Results

3.1. Sample characteristics

Table 1 describes individual characteristics for our sample. Veterans were mostly male and White. Fifty-seven percent of Veterans described heavy drinking in the past month. In the past month, 49.0 % reported not having sex, 40.5 % had sex with one person, and 10.0 % with more than one sexual partner. Forty-eight percent of Veterans with regular partners had sex in the past month, 15.2 % of whom reported using a condom every time and 84.9 % condom use variability. Twenty-six percent of Veterans reported having a casual partner, 23.0 % of whom reported using a condom every time and 77.1 % condom use variability. Forty-nine percent of Veterans who endorsed sex in the past month reported they had a sexual encounter while intoxicated.

3.2. Main analyses

In all full models, we observed no significant interactions. Therefore, to preserve parsimony in our models, estimates from only our four main effects models were interpreted (Table 2).

Older age and women were significantly associated with fewer sexual partners, whereas non-White race was significantly associated with more sexual partners; all effects were small (b^* standardized coefficient between 0.07 and 0.24; Cohen, 1988). Current employment, heavy drinking, and PTSD symptoms were not statistically significantly associated with number of sexual partners. The adjusted R^2 of Model 1 was 6 %, $F = 9.03$.

Compared to non-White Veterans, White Veterans who reported sex with a regular partner in the past 30 days were significantly less likely to use condoms with that partner; this effect was small, $b^* = 0.21$. Age, sex, current employment, heavy drinking, and PTSD symptoms did not significantly predict condom use. The adjusted R^2 of Model 2 was 3 %, $F = 2.96$.

For Veterans who reported sexual encounters with casual sexual partners in the past 30 days, younger or White Veterans were significantly less likely to use condoms; the effect of age was small ($b^* = 0.19$) whereas that of race was medium ($b^* = 0.36$). Sex, current employment, heavy drinking, and PTSD symptoms did not significantly predict condom use. The adjusted R^2 of Model 3 was 11 %, $F = 5.58$.

Among Veterans who reported having sex in the past 30 days, non-White Veterans and Veterans who reported a greater percentage of heavy drinking days were significantly more likely to have sex while intoxicated from alcohol/drugs; race demonstrated a small effect ($OR = 2.01$), while heavy drinking a medium effect ($OR = 5.35$). Sex, current employment, and PTSD symptoms did not significantly predict sex while intoxicated. The adjusted pseudo-R^2 of Model 4 was 15 % and the model was significant, $X^2(10, 395) = 47.82$, $p < 0.001$.

Table 2
Regression Models Predicting Recent Sexual Behaviors.

Outcomes	# of Sexual Partners	Condom Use with Regular Partner	Condom Use with Casual Partner	Sex While Intoxicated
Variable	B (*SE*)	B (*SE*)	B (*SE*)	*OR* (*SE*)
Constant	1.58 (0.18)	3.70 (0.52)	2.61 (0.84)	0.15 (0.78)
Age	−0.04 (0.00)***	0.01 (0.01)	0.02 (0.01)**	0.99 (0.01)
Gender[a]	−0.23 (0.11)*	0.02 (0.32)	0.50 (0.55)	1.72 (0.48)
Race[b]	0.20 (0.06)**	−0.67 (0.17)***	−1.32 (0.25)***	2.01 (0.25)**
Employed[c]	−0.02 (0.07)	0.02 (0.17)	−0.12 (0.27)	1.50 (0.25)
Heavy drinking	−0.02 (0.03)	0.06 (0.21)	0.11 (0.32)	5.35 (0.32)***
PTSD symptom score	0.03 (0.03)	0.00 (0.01)	0.00 (0.01)	1.01 (0.01)
Measures of fit	Adjusted $R^2 = 0.06$ $F = 9.03$, $p < 0.001$	Adjusted $R^2 = 0.03$ $F = 2.96$, $p = 0.008$	Adjusted $R^2 = 0.11$ $F = 5.58$, $p < 0.001$	Pseudo-$R^2 = 0.15$ $X^2 = 47.82$, $p < 0.001$

Note. B = unstandardized regression coefficient; *SE* = standard error; OR = odds ratio; Heavy drinking = % of past 30 days with ≥ 5 standard drinks consumed for men, ≥ 4 for women; PTSD = posttraumatic stress disorder. Pseudo-R^2 = Nagelkerke.
*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$.
[a] Male = 1, female = 2.
[b] White = 0, non-White = 1.
[c] Employed = 1, not employed = 2.

4. Discussion

We examined associations between heavy drinking, PTSD symptom severity, and sexual behaviors linked to potential health risks among Veterans. As expected, heavy drinking was significantly and positively associated with having sex while intoxicated from alcohol and/or drugs. This is consistent with research supporting the link between alcohol consumption and sexual behavior in Veterans (Cook et al., 2006; Lehavot et al., 2016; Rodriguez et al., 2023). However, heavy drinking did not significantly relate to the other sexual behaviors assessed. We also did not find significant associations between PTSD symptoms and RSBs, nor did PTSD symptoms interact with heavy drinking to predict RSBs. These latter findings differ from prior studies showing certain sexual behaviors were positively associated with PTSD severity and/or alcohol consumption among Veterans (Blais et al., 2023; Combellick et al., 2019; Strom et al., 2012). While this null finding may be a function of our sample's greater representation by male Veterans, heavy drinking was associated with RSBs among male Veterans in Combellick et al.'s (2019) study. In short, while RSBs are present in this population, the occurrence of these behaviors may not be sufficiently explained by our examined variables, as demonstrated by the small-to-moderate effect sizes of our models. Theoretically, this may also mean that for treatment-seeking Veterans, risky sexual behavior may not just be a consequence of disinhibition from alcohol nor an emotion regulation technique following trauma.

Some sociodemographic predictors exhibited relationships with RSBs. Younger Veterans were more likely to have more sexual partners and less likely to use condoms. Male Veterans were also more likely to have more sexual partners. Further, when compared to non-White Veterans, White Veterans reported fewer sexual partners and lesser frequent condom use with regular and casual partners. The strongest effect was observed for non-White Veterans, who were more likely to engage in a sexual encounter while intoxicated. Our results that White Veterans reported less condom use differs from other studies that found Black and Latino/a civilians were significantly less likely to use condoms vs. White civilians (e.g., Holway & Hernandez, 2017; Rocca & Harper, 2012).

Although PTSD and alcohol did not significantly predict RSBs, 57.3 % of Veterans reported at least one day of heavy drinking in the past month, higher than what has been observed in active-duty personnel (i.e., 43.2 %; Stahre et al., 2009) and Veterans (i.e., 22.6 %; Wagner et al., 2007); this is understandable given Veterans were recruited from substance use and mental health treatment clinics. Of those who had sex in the past 30 days, nearly half reported having sex at least once while under the influence of alcohol/drugs, which may increase risk for STIs, unintended pregnancies, and other health consequences, which supports the need for screening and sexual health interventions in these clinical populations. Additionally, 73.2 % of those who had sex in the past 30 days with a regular partner reported never using a condom and 59.0 % of those who had sex with a casual partner did not use a condom. Although we do not know the motivations for not using condoms (e.g., use of other birth control methods, no longer concerns about pregnancy if post-menopausal female partner, intentionally trying to conceive), the prevalence of condomless sex and sex while under the influence of alcohol/drugs suggest a potential avenue to employ harm reduction approaches to improve health outcomes when necessary. Further, the larger effect of non-White race on sex while under the influence of drugs/alcohol requires further examination and culturally informed interventions.

Several limitations are worth noting. First, the cross-sectional design of this data prevents inferences of causation. Second, limited gender and racial representation also prevents more granular and less biased estimates of intersectional differences in these relationships. Despite this, the results of this study allow insights into a Veteran population with potentially more mental and substance use concerns and suggest further research to explain which modifiable factors may be more predictive of RSBs.

5. Conclusion

Findings suggest additional research is warranted to elucidate the relationship between alcohol consumption, PTSD symptoms, and sociodemographic characteristics predicting recent sexual risk behaviors among Veterans presenting for care at mental health and/or substance use within the VA healthcare system. We encourage continued replication of these analyses to increase our ability to predict and prevent risky sexual behaviors among diverse populations. Meanwhile, healthcare providers working with Veterans presenting with PTSD and substance use should screen for RSBs to inform and tailor interventions.

CRediT authorship contribution statement

Joseph W. Tu: Writing – review & editing, Writing – original draft, Supervision. **Rachael J. Shaw:** Writing – original draft, Formal analysis. **Autumn Rae Florimbio:** Writing – original draft, Formal analysis. **Kaitlyn McCarthy:** Writing – original draft. **Erin E. Bonar:** Writing – review & editing, Project administration, Methodology, Investigation, Data curation, Conceptualization. **Stephen T. Chermack:** . **Jamie J. Winters:** Methodology, Investigation, Data curation, Conceptualization. **Maureen A. Walton:** Writing – review & editing, Methodology, Investigation, Data curation, Conceptualization. **Minden B. Sexton:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

The authors do not have permission to share data.

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