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Alcohol Screening and Brief Intervention in a Representative Sample of Veterans Receiving Primary Care Services

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Abstract

Aims: Unhealthy alcohol use is common among adults, and in particular, Veterans. Routine alcohol screening followed by brief intervention is recommended and considered a prevention priority in primary care settings. While previous studies have found that Veterans enrolled in the Veteran's Health Administration (VA) receive high rates of screening and brief intervention, less than 50% of Veterans receive VA health care. No study has evaluated receipt of these services in a general sample of Veterans. Therefore, in a nationally-representative sample, we examine whether Veteran status was associated with receiving alcohol screening and brief intervention in primary care.

Methods: Using the Centers for Disease Control and Prevention's 2014 Behavioral Risk Factor Surveillance System data, we identified adults who endorsed visiting a doctor for routine checkup at least once in the past two years and responded to an optional module assessing alcohol-related care (N=92,206; 14.1% Veterans). Multivariable logistic regression was used to assess the association between Veteran status and screening and brief intervention outcomes. We also

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evaluate differences in alcohol-related care across Veteran status stratified by gender. Models were adjusted for sociodemographic and clinical characteristics likely to confound the association.

Results: Overall, Veterans were more likely than non-Veterans to be screened for alcohol quantity and heavy episodic drinking ($p < .05$), and more likely to endorse receiving brief intervention advice about alcohol's harmful effects ($p < .001$). Veteran status predicted an increased likelihood of being screened and receipt of advice about alcohol's harmful effects, but did not predict the likelihood of receiving advice to reduce or abstain from drinking (AOR=1.00, 95% C.I. [0.80-1.26]). Analyses stratified by gender indicated a similar pattern of results for males as the overall sample. Results among females indicated Veteran status predicted the likelihood of being asked about heavy episodic drinking (AOR=1.47, 95% C.I. [1.09-1.99]) and being offered advice about the harmful effects of alcohol (AOR=1.62, 95% C.I. [1.06-2.48]). Female Veterans were not more likely than female non-Veterans to be advised to reduce and/or abstain from drinking.

Conclusions: Screening about any alcohol use was common while report of screening for quantity and heavy episodic drinking occurrence and report of brief intervention were less common. Veterans were more likely than non-Veterans to report receiving recommended care, though rates of advice to reduce or abstain from drinking did not differ across groups. Persistent gaps in delivery of recommended alcohol-related care, especially for particularly vulnerable subpopulations such as women Veterans, suggest a need for quality improvement.

Keywords

Alcohol; Brief Intervention; Primary Care; Veteran health; Gender; Unhealthy alcohol use

1. Introduction

Approximately one out of every five adult patients seen in primary care report unhealthy alcohol use (22%; Vinson et al., 2010) and rates among Veterans seeking primary care services may be equal to or higher than this (approximately 30%; Burnett-Ziegler et al., 2011; Hawkins, Lapham, Kivlahan, & Bradley, 2010). Unhealthy alcohol use, defined as the spectrum from drinking above recommended limits (more than 7 drinks/week for women or more than 14 drinks/week for men or more than 3 drinks/occasion for women or more than 4 drinks/occasion for men; NIAAA, 2005) to meeting diagnostic criteria for alcohol use disorders (Saitz 2005), leads to multiple harmful negative consequences, ranging from mild (e.g., hangover) to severe (e.g., mortality; Centers for Disease Control and Prevention, 2017; Mokdad et al., 2018). In addition, the economic and societal costs of unhealthy alcohol use in the United States are staggering. Recent work estimates that unhealthy drinking costs approximately \$170 billion per year in lost productivity (e.g., work disruption, incarceration), health care costs (e.g., hospitalization, ambulatory care), criminal justice, and other effects (e.g., motor vehicle crashes, property damage; Bouchery, Harwood, Sacks, Simon & Brewer, 2011). Moreover, a vulnerable subpopulation, female Veterans, may be more at risk for negative consequences than their female non-Veteran peers, as they are more likely to experience mental health disorders associated with alcohol use, including depression, anxiety, other comorbid psychiatric disorders (Frayne et al., 2006; Lehavot,

Hoerster, Nelson, Jakupcak, & Simpson 2012; Pemberton et al., 2016) and suicide (Bonhert et al., 2017; Ilgen et al., 2010; Kaplan, McFarland, & Huguette, 2009; McCarthy et al., 2009).

Comparisons of past year rates of unhealthy alcohol use between Veterans and non-Veterans vary depending on the definition of use (e.g., heavy episodic drinking versus drinking above recommended limits) and on age and gender. For example, male Veterans (ages 18-30) report heavy episodic drinking occurrences at the same high rates as their male non-Veteran counterparts (~36%; Grossbard et al., 2013). However, older male Veterans (61+) may be more likely to report unhealthy alcohol use (~3-10%) than older male non-Veterans (~2-8%; Bonhert, Ilgen, Louzon, McCarthy, & Katz, 2012). Research has also found that female Veterans, compared with their female non-Veteran peers, report both heavy episodic and unhealthy drinking at similar rates (~9% overall for heavy episodic and ~4% for unhealthy drinking; Lehavot et al., 2012; Pemberton et al., 2016).

Screening for unhealthy alcohol use and providing brief behavioral interventions to those screening positive in primary care can reduce alcohol use (Jonas et al., 2012; Kaner et al., 2009). Both the U.S. Preventive Services Task Force (Maciosek et al., 2017; Moyer, 2013; Whitlock et al., 2004) and the National Institute on Alcohol Abuse and Alcoholism (NIAAA, 2005) recommend routine screening and brief alcohol-related interventions in primary care. Within the past 15 years, the Veterans Health Administration (VA) has implemented both alcohol screening for all Veteran outpatients annually and brief intervention for those screening positive (Bradley et al., 2006; Lapham et al., 2012). Both practices are incentivized via national performance measures and supported through electronic clinical reminders which prompt and support documentation of clinical care for clinicians (Bradley et al., 2006; Lapham et al., 2012; Williams et al., 2014, 2015, 2016). However, only about one-third of all Veterans receive health care from the VA (U.S. Department of Veterans Affairs, 2018), thus, rates of receiving alcohol screening and brief intervention among Veterans overall, as well as rates specific to male and female Veterans, are unknown. Research is needed to examine whether evidence-based alcohol related care is being delivered to a representative sample of Veterans whose care may not be delivered by the VA. In addition, studies should investigate whether vulnerable groups of Veterans, particularly women Veterans, receive recommended alcohol-related care.

Therefore, we evaluate rates of receiving alcohol-related screening and brief intervention in primary care across Veteran status within a nationally representative sample, adjusting for relevant sociodemographic and other health-related covariates. We investigate these questions among all participants and then stratified by gender due to a large body of past empirical work demonstrating gender differences in receipt of brief intervention (men more likely than women) among Veterans using the VA (Burman et al., 2004; Williams et al., 2017) and among civilian populations (Bertakis & Azari, 2007; Denny, Serdula, Holtzman, & Nelson, 2003; McKnight-Eily et al., 2014; Mukamal, 2007; Volk, Steinbauer, & Cantor, 1996). We hypothesized that Veterans would be more likely than non-Veterans to report receiving alcohol screening (i.e., being asked whether one drank, how much one drank, and whether one drank at heavy episodic drinking levels) and alcohol-related intervention (i.e., offered advice about levels of harmful drinking and advised to reduce or abstain from drinking). In addition, we assess intervention questions among all participants regardless of

reported levels of alcohol use, and among only those participants endorsing unhealthy alcohol use for whom brief intervention is recommended (Jonas et al., 2012). This approach is consistent with recommended approaches to denominator specification for measurement of receipt of alcohol-related care. We hypothesized that Veteran status would be associated with increased likelihood of receiving evidence-based alcohol-related care.

2. Methods

2.1 Study design, data collection and study sample

The current study used cross-sectional, nationally representative data collected from the Centers for Disease Control and Prevention's (CDC) 2014 Behavioral Risk Factor Surveillance System (BRFSS; CDC, 2015a, 2015b). The BRFSS uses random digit dialing (calling landline and cell phone numbers) to contact a sample of U.S. adults in all states and territories, asking them information about their health-related risk behaviors, chronic health conditions, and use of various preventive services. All states and territories administer a standard core set of questions and then can elect to administer optional modules. The 2014 survey included an optional module entitled "Alcohol Screening and Brief Intervention (ASBI)" which was given to participants if they endorsed visiting a doctor for a routine checkup (i.e., general physical exam) at least once in the past two years. Twelve states elected to administer the ASBI optional module as part of the core survey: California, Connecticut, District of Columbia, Hawaii, Kentucky, Minnesota, Montana, New Mexico, Oregon, Texas, Washington, and Wisconsin. Of the 108,436 people sampled across these 12 states, 85.03% (N=92,206) indicated a checkup in the past two years, and thus, were administered the ASBI module and designated as the analytic study sample. The study was approved by the institutional review board at [institution masked for review].

2.2 Measures

2.2.1. Sociodemographic characteristics.—Sociodemographic items included gender (male or female); age (18-44, 45-64, 65+); race (black, Hispanic, multiracial, other, and white); educational attainment (high school diploma or less vs. some college or greater); marital status (partnered, formerly married, or never married); employment status (employed, unemployed, out of workforce [i.e., homemaker, student, unable to work], or retired); and home state (McKnight-Eily et al., 2014).

2.2.2. Veteran status.—A dichotomous variable was created from the question "Have you ever served on active duty in the United States Armed Forces, either in the regular military or in a National Guard or military reserve unit?" Individuals who answered "Yes" were considered a "Veteran" and coded as "1" and individuals who answered "No" were considered non-Veterans and coded as "0". Those who answered "Don't know/Not sure", "Refused", or had missing data were excluded from analyses (<1%).

2.2.3. Alcohol Screening and Brief Intervention (ASBI).—The ASBI module consisted of five (Yes/No) items about screening and intervention components in reference to the participant's most recent routine check-up. Three items about screening included: (1) "At [your] last checkup, were you asked in person or on a form if you drink alcohol?", (2)

“Did the healthcare provider ask you in person or on a form how much you drink?”, and (3) “Did the healthcare provider specifically ask whether you drank [5 for men /4 for women] or more alcoholic drinks on an occasion?” Two brief intervention items included: (1) “Were you offered advice about what level of drinking is harmful or risky for your health?” and (2) “Healthcare providers may also advise patients to drink less for various reasons. At your last routine checkup, were you advised to reduce or quit your drinking?” This last item was only administered to participants who said “Yes” to at least one of the first three screening items. All items were used as dependent variables in study analyses (see Data Analysis section).

2.2.4. Alcohol use.—Four alcohol consumption variables based on responses to the core set of alcohol use items were created and examined in bivariate analyses (see Blosnich, Lehavot, Glass, & Williams, 2017). First, a dichotomous (Yes/No) “any alcohol use” variable was computed based on the following question: “During the past 30 days, how many days per week or per month did you have at least one drink of any alcoholic beverage such as beer, wine, a malt beverage, or liquor?” Second, we used the CDC-created dichotomous (Yes/No) “any risky drinking” variable, based on the following item: “During the past 30 days, on the days when you drank, about how many drinks did you drink on the average?” Men reporting >2 drinks/day and women reporting >1 drink/day in the past 30 days met criteria for any risky drinking, consistent with NIAAA (2005) gender-specific definitions. Third, a dichotomous (Yes/No) variable indicating report of “any heavy episodic drinking” was created from the following item, “Considering all types of alcoholic beverages, how many times during the past 30 days did you have 5/4 (for men/women) or more drinks on an occasion?” All participants reporting any heavy drinking episodes met criteria for any heavy episodic drinking. Last, we created a dichotomous (Yes/No) consumption variable labeled “any unhealthy alcohol use” defined as meeting criteria for either risky drinking or heavy episodic drinking in the past 30 days (Saitz, 2005).

2.2.5. Health-related items.—Because of their strong association with alcohol use which could influence receipt of alcohol screening and brief intervention, we measured tobacco use (Miller & Gold, 1998; coded as nonsmoker, current smoker, or former smoker) and depression diagnosis (Fergusson, Boden, & Horwood, 2009; “Has a doctor, nurse, or other health professional ever told you that you have a depressive disorder, including depression, major depression, dysthymia, or minor depression?”). Lifetime depression diagnosis was coded as Yes/No.

2.3. Data Analysis

We used chi-square tests to compare Veterans and non-Veterans on receipt of ASBI, alcohol consumption variables, sociodemographic characteristics, and health-related factors. We computed multivariable logistic regressions to evaluate the association between Veteran status and the five ASBI items, adjusting for sociodemographic and health-related factors among the overall sample and stratified by gender. We then repeated analyses of brief intervention outcomes only among persons reporting any unhealthy alcohol use. Effect sizes and statistical significance are presented by the adjusted odds ratio and 95% confidence intervals. Analyses were weighted and adjusted for stratification and clustering due to the

complex survey design of the BRFSS. All analyses were conducted in Stata/SE Version 13 (StataCorp LP, College Station, TX).

3. Results

3.1. Sample description

3.1.1. Sociodemographic and health-related comparisons.—Veterans comprised approximately 14.1% of the eligible sample ($n=13,022$). Out of the 13,022 Veterans, 11,781 were males (90.5%) and 1,241 were females (9.5%). Overall, Veterans were more likely than non-Veterans to be older, white, have more than a high school education, partnered, and retired (Table 1). Gender-stratified comparisons of characteristics across Veteran status were generally similar to those identified in the overall sample (Table 1). However, female Veterans were more likely than female non-Veterans to be younger, identify as black race, have more than a high school education, be partnered, identify as a current or former smoker and endorse a lifetime diagnosis of depression. Overall, Veterans were more likely than non-Veterans to report consuming any alcoholic beverages in the past 30 days, but no differences in measures of unhealthy alcohol use were observed across Veteran status (Tables 1 and 2). In gender stratified analyses, male Veterans were less likely than male non-Veterans to endorse heavy episodic drinking (15.3% v. 21.7%; Table 1) and less likely to report unhealthy alcohol use (15.1% v. 19.4%; Table 2). Female Veterans did not differ on any alcohol consumption variables as compared to female non-Veterans.

3.2. ASBI Bivariate Analyses

Table 2 also reports the bivariate comparisons between Veterans and non-Veterans on ASBI endorsement among the overall sample, stratified by gender, and among only those endorsing unhealthy alcohol use ($n = 11,996$). Overall, Veterans were more likely than non-Veterans to be screened for both alcohol quantity and heavy episodic drinking ($ps < .05$). Veterans were also more likely than non-Veterans to endorse receiving advice about alcohol's harmful effects ($p < .001$). Among individuals endorsing unhealthy alcohol use, Veterans (25.2-48.1%) were more likely than non-Veterans (17.8-30.3%) to report being offered advice about alcohol's harms and being advised to reduce or abstain from alcohol use ($ps < .01$).

In gender stratified analyses, male Veterans were more likely than male non-Veterans to receive alcohol screening inquiring about quantity (69% v. 63.7%) and heavy-episodic drinking behavior (36.4% v. 28.7%; $ps < .001$), as well as advice about alcohol's harmful effects (30.4% v. 26.4%; $p < .01$). This latter finding held when examining only males who reported unhealthy alcohol use (Veterans: 50.0% v. non-Veterans: 35.7%; $p < .01$). Male Veterans were less likely than male non-Veterans to endorse being advised to reduce/abstain from alcohol (10.8% v. 14.3%; $p < .01$); however, this result was non-significant when looking at only males reporting unhealthy alcohol use ($p = .37$). Female Veterans were more likely than female non-Veterans to receive alcohol-related screens (both those assessing quantity [72.9% v. 64.4%] and heavy-episodic drinking [36.2% v. 28.8%]; $ps = .03$), but not more likely to receive any brief intervention, regardless of report of unhealthy alcohol use.

3.3. ASBI Multivariable Analyses

Table 3 presents the unadjusted and adjusted odds ratios for the overall sample assessing whether Veteran status predicted the likelihood of endorsing receipt of ASBI. Veterans had an increased likelihood of being screened based on all three items and receiving advice about alcohol's harmful effects. Veteran status was not associated with receiving advice related to reducing or abstaining from drinking (AOR=1.00, 95% C.I. [0.80-1.26]). This pattern of results stayed the same when examining only those who reported unhealthy alcohol use.

In analyses stratified by gender (Table 4), patterns remained the same as those in overall analyses for males. In contrast, among females, Veteran status was not associated with being asked about any drinking or quantity of drinking. However, female Veterans were more likely than female non-Veterans to report being asked about heavy episodic drinking (AOR=1.47, 95% C.I. [1.09-1.99]) and being offered advice about the harmful effects of alcohol (AOR=1.62, 95% C.I. [1.06-2.48]). Female Veterans were not more likely than female non-Veterans to report being advised to reduce and/or abstain from drinking. Among women reporting any unhealthy alcohol use, Veteran status was not associated with reporting receipt of brief intervention.

4. Discussion

The present study examined whether Veteran status is associated with receiving alcohol screening and brief intervention, overall and stratified by gender, in a nationally representative sample of U.S. adults. Overall, findings suggest that Veterans are more likely than non-Veterans to report receiving both alcohol screening and brief intervention. For men, results were consistent across outcome measures. For women, most outcomes did not differ across Veteran status.

Within the overall sample, bivariate analyses suggested that screening about any alcohol consumption was common (~75%) while report of screening for more specific indices of use (typical quantity and occurrence of heavy episodic drinking) as well as report of receiving a brief intervention, were less common. Although most rates were low, Veterans were more likely than non-Veterans to report receiving recommended care in both bivariate and multivariable analyses, and this pattern was particularly strong among men. Approximately one-third of Veterans reported being asked about heavy episodic use and, among Veterans reporting any unhealthy alcohol use, 48% were offered advice about alcohol's harms and ~25% were advised to reduce/abstain. It is possible that these results reflect receipt of care at the VA, where substantial efforts have been undertaken to implement alcohol screening and brief intervention over the past decade (Bradley et al., 2006; Moyer & Finney, 2010; Williams et al., 2011). Unfortunately, location of care receipt is not assessed in the BRFSS and thus the current study could not determine whether care received among Veterans was received in the VA. However, estimates from 2015 suggest that ~34% of male and 31% of female Veterans use the VA with 12% of male and 21% of female Veterans using VA exclusively (U.S. Department of Veterans Affairs, 2016). Therefore, it is unlikely that the majority of Veterans sampled by BRFSS receive care exclusively in VA.

Among females overall, and particularly female Veterans, rates of receiving brief intervention were quite low. Specifically, only 24% of female non-Veterans and 28% of female Veterans who reported unhealthy alcohol use also reported being offered advice about alcohol's harms and only 10% of female non-Veterans and 8% of female Veterans reported being advised to reduce or quit alcohol. These low rates among women align with those identified in prior work, both in the VA and outside the VA (e.g., Bertakis & Azari, 2007; Kaner et al., 2007; Williams et al., 2017). Previous studies have hypothesized mechanisms underlying low levels of receipt of alcohol-related care among women, such as gender-based stereotypes resulting in conscious or unconscious bias by providers in their administration of alcohol screening and brief intervention (e.g., Dovidio & Fiske, 2012), or heightened alcohol-related stigma in alcohol-related discussions with women (Livingston, Milne, Fang, & Amari, 2012). Results from the present study indicate a continued need for research to assess mechanisms underlying low levels of care receipt for women with unhealthy alcohol use and to develop interventions to increase receipt of needed care among women.

Consistent with prior research, rates of unhealthy alcohol use were similar between women Veterans and non-Veterans (Delaney et al., 2014; Hoggatt, Lehavot, Krennek, Schweizer, & Simpson, 2017; Lehavot et al., 2012; McCauley, Blosnich, & Dichter, 2015). However, previous research has also suggested substantial harm associated with increasing levels of alcohol use among women Veterans (Chavez, Williams, Lapham, & Bradley, 2012), especially among those with comorbid mental health disorders (Hankin et al., 1999; Nunnink et al., 2010). As women Veterans have higher rates of depression than non-Veterans (found in the present study and others, e.g., Lehavot et al., 2012), as well as higher rates of anxiety and other mental distress, women Veterans may experience greater alcohol-related consequences than women non-Veterans (e.g., Mitchell, Blosnich, Gordon, & Broyles, 2017). Thus, low rates of alcohol-related care among women Veterans may be particularly concerning.

One finding of note in the present study is that, though Veterans were more likely than non-Veterans to use any alcohol in the past 30 days, heavy episodic drinking was more common among male non-Veterans than male Veterans (although unhealthy drinking rates were similar), and no differences in consumption were identified among women by Veteran status. These results confirm those from prior studies comparing measures of unhealthy alcohol use across Veteran status among males (Bonhert et al., 2012; Grossbard et al., 2013; Hoerster et al., 2012; Hoggatt et al., 2017) and females and provide increased support for the notion that Veterans are not at increased risk of unhealthy alcohol use relative to non-Veterans.

However, given similar consumption patterns, it is encouraging that Veterans, a vulnerable group often found to be in poorer health than their peers (Hoerster et al., 2012; Kazis et al., 1998), were overall more likely to endorse receipt of important alcohol care in the present study.

4.1. Limitations

The current study has several limitations that should be noted. First, alcohol use was assessed during the past 30 days, whereas brief intervention receipt could have occurred at

any point in the previous two years (as assessed by the BRFSS). Therefore, we could not discern whether low brief intervention rates were due to changes in unhealthy alcohol use from the time of the primary care appointment to the time of the BRFSS (i.e., those endorsing unhealthy alcohol use may not have done so during their primary care visit) or due to true missed opportunities to address unhealthy alcohol use. Along these lines, as others have stated (e.g., Kanny, Naimi, Liu, Lu, & Brewer, 2018), both consumption and care measures were based on self-report, which may underestimate consumption outcomes and over-estimate care outcomes as a result of social desirability bias. In addition, because the analytic sample included data from only 12 states, the results may not be representative of the U.S. population. Finally, as noted above, it is possible that increased likelihood of care receipt among Veterans may in part reflect VA's efforts to implement screening and brief intervention when appropriate. However, given that most Veterans do not receive care in VA and even fewer exclusively receive care in VA, it is unlikely this is the main driver of findings.

5. Conclusions

Despite these limitations, the current study sheds light on possible gaps in delivery of recommended alcohol-related care, particularly for vulnerable subpopulations such as women, regardless of Veteran status. Findings support earlier studies in suggesting a need for quality improvement in the implementation of ASBI within primary care settings. Continued research that attempts to both reduce the stigma associated with alcohol use and increase healthcare providers' self-efficacy in delivering effective and patient-centered brief interventions (e.g., Bobb et al., 2017) is likely needed in order to improve delivery of ASBI in primary care.

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Highlights

- Screening about any alcohol use was common
- Screening for quantity and heavy episodic drinking and report of brief intervention were less common
- Veterans were more likely than non-Veterans to report receiving recommended care
- Rates of advice to reduce or abstain/from drinking did not differ by Veteran Status
- Gaps in delivery of alcohol-related care suggest a need for quality improvement

Table 1. Sociodemographics, health-related factors, and alcohol consumption by Veteran status and stratified by gender

	Overall Sample						Men		Women		p
	Veteran (n=13,022)			Nonveteran (n=78,970)			Veteran (n=11,781)		Nonveteran (n=25,797)		
	%	%	p	%	%	p	%	%	%	%	
Gender											
Men	89.8	41.2	<.001	--	--	--	--	--	--	--	--
Women	10.2	58.8		--	--	--	--	--	--	--	--
Age											
18-44	25.9	47.6	<.001	23.4	52.5	<.001	47.7	44.1			0.03
45-64	30.3	35.3		29.4	36.4		37.6	34.5			
>65	43.8	17.2		47.2	11.1		14.7	21.4			
Race											
White	70.3	53.8	<.001	71.5	51.4	<.001	59.7	55.5			0.001
Black	9.8	7.6		9.4	7.2		13.6	7.9			
Other	6.0	10.9		5.5	11.5		10.5	10.5			
Multiracial	1.9	1.4		1.7	1.3		3.5	1.4			
Hispanic	12.0	26.3		11.9	28.7		12.7	24.7			
Education											
> High school education	68.5	58.6	<.001	67.2	56.5	<.001	80.2	60.1			<.001
High school diploma	31.5	41.4		32.8	43.6		19.8	39.9			
Marital Status											
Partnered	66.7	56.4	<.001	67.3	58.5	<.001	61.3	55.0			<.001
Formerly married	22.7	19.4		22.1	11.9		27.7	24.7			
Never married	10.6	24.1		10.6	29.6		11.0	20.3			
Employment Status											
Employed	46.2	56.1	<.001	45.3	68.9	<.001	54.1	47.1			0.07
Unemployed	3.4	6.1		3.3	63.3		4.4	5.9			
Out of workforce	8.8	22.2		7.3	13.3		22.0	28.4			
Retired	41.6	15.7		44.1	11.5		19.5	18.6			

State	Overall Sample				Men				Women			
	Veteran (n=13,022)		Nonveteran (n=78,970)		Veteran (n=11,781)		Nonveteran (n=25,797)		Veteran (n=1,241)		Nonveteran (n=53,173)	
	%		%		%		%		%		%	
Washington D.C.	8.3		91.7	<.001	16.3		83.7	<.001	1.6		98.4	<.001
California	10.2		89.8		19.3		80.7		2.0		98.1	
Connecticut	10.4		89.6		20.9		79.2		1.5		98.6	
Hawaii	16.5		83.5		31.5		68.5		2.6		97.4	
Kentucky	12.8		87.2		25.4		74.6		2.3		97.7	
Minnesota	11.2		88.8		22.3		77.7		1.6		98.4	
Montana	15.7		84.3		30.1		70.0		3.0		97.0	
New Mexico	14.4		85.6		29.2		70.8		2.2		97.8	
Oregon	14.1		85.9		27.7		72.3		2.5		97.5	
Texas	12.4		87.6		23.4		76.6		2.9		97.1	
Washington	14.5		85.5		27.5		72.6		3.2		96.8	
Wisconsin	12.2		87.8		25.0		75.0		1.3		98.7	
Depression												
Never depressed	84.8		83.1	0.03	86.2		88.4	0.004	72.0		79.5	0.008
Lifetime depression diagnosis	15.3		16.9		13.8		11.6		28.0		20.5	
Tobacco use												
Never smoked	42.3		65.0	<.001	41.0		59.7	<.001	53.6		68.7	<.001
Current smoker	14.9		13.1		14.5		15.7		18.2		11.2	
Former smoker	42.9		21.9		44.5		24.6		28.2		20.1	
Alcohol use in the past 30 days												
Any alcohol use	59.2		51.9	<.001	59.9		59.1	0.49	52.9		46.9	0.08
Risky alcohol use	5.7		5.5	0.60	5.6		6.0	0.43	7.1		5.1	0.26
Heavy episodic drinking	14.8		15.2	0.52	15.3		21.7	<.001	10.3		10.8	0.81

Note. Percentages are weighted.

Table 2.
Unhealthy alcohol use and ASBI prevalence rates by Veteran status and stratified by gender

	Overall Sample			Men		Women		
	Veteran (n=13,022)	Nonveteran (n=78,970)	<i>p</i>	Veteran (n=11,781)	Nonveteran (n=25,797)	Veteran (n=1,241)	Nonveteran (n=53,173)	<i>p</i>
Unhealthy alcohol use in the past 30 days	N (%)	N (%)	<i>p</i>	N (%)	N (%)	N (%)	N (%)	<i>p</i>
Any unhealthy alcohol use ^a	1,710 (14.8)	10,286 (14.5)	0.68	1,556 (15.1)	4,898 (19.4)	154 (11.6)	5,388 (11.0)	0.77
ASBI Module								
1. Asked if you drink any alcohol	8,231 (75.3)	49,531 (76.0)	0.54	7,409 (74.8)	16,216 (75.2)	822 (80.9)	33,315 (76.5)	0.14
2. Asked how much you drink	7,558 (69.3)	42,785 (64.1)	<.001	6,794 (69.0)	14,069 (63.7)	764 (72.9)	28,716 (64.4)	0.03
3. Asked about heavy episodic drinking	3,512 (36.4)	16,880 (28.8)	<.001	3,159 (36.4)	5,709 (28.7)	353 (36.2)	11,171 (28.8)	0.03
4. Offered advice about harmful alcohol use	2,844 (29.8)	12,042 (21.2)	<.001	2,624 (30.4)	5,121 (26.4)	220 (24.3)	6,921 (17.6)	0.06
5. Advised to reduce/quit alcohol ^b	829 (10.8)	3,614 (9.8)	0.27	775 (10.8)	1,805 (14.3)	54 (10.6)	1,809 (6.8)	0.30
Brief intervention rates only among participants reporting any unhealthy alcohol use in the past 30 days								
(Total N=11,996)								
1. Offered advice about harmful alcohol use	702 (48.1)	2,876 (30.3)	<.001	662 (50.0)	1,608 (35.7)	40 (28.0)	1,268 (23.7)	0.56
2. Advised to reduce/quit alcohol ^b	351 (25.2)	1,257 (17.8)	0.002	331 (26.9)	787 (24.3)	20 (7.9)	470 (10.0)	0.57

Note. Percentages are weighted.

^aItem was created as a dichotomous variable defined as meeting criteria for engaging in either risky alcohol use or heavy episodic drinking in the past 30 days;

^bSample size for this item only included those that answered "yes" to ASBI items 1, 2, or 3.

Table 3.

Veteran status predicting likelihood of receiving an ASBI among overall sample and those endorsing unhealthy alcohol use

	Screening 1: Asked about any consumption	Screening 2: Asked quantity of consumption	Screening 3: Asked whether one engaged in heavy episodic drinking	Brief Intervention 1: Offered advice about harmful alcohol use	Brief Intervention 2: Advised to reduce and/or abstain ^a
Veteran Status	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Unadjusted	0.97 (0.87-1.08)	1.27 (1.15-1.40)	1.42 (1.28-1.56)	1.58 (1.42-1.76)	1.11 (0.92-1.34)
Adjusted [*]	1.35 (1.19-1.54)	1.51 (1.34-1.70)	1.77 (1.58-1.99)	1.47 (1.29-1.67)	1.00 (0.80-1.26)
Brief intervention outcomes assessed only among participants reporting any unhealthy alcohol use in the past 30 days					
Unadjusted				2.13 (1.70-2.67)	1.56 (1.18-2.07)
Adjusted [*]				1.61 (1.25-2.07)	1.04 (0.77-1.41)

Note. Significant values in bold ($p < .05$).

^{*} Adjusted models included gender, age, race, education, marital status, employment status, state residency, lifetime depression diagnosis, and tobacco use.

^a Sample size for this item only included those that answered "yes" to screening items 1, 2, or 3.

Table 4.

Veteran status predicting likelihood of receiving an ASBI stratified by gender

	Screening 1: Asked about any consumption	Screening 2: Asked quantity of consumption	Screening 3: Asked whether one engaged in heavy episodic drinking	Brief Intervention 1: Offered advice about harmful alcohol use	Brief Intervention 2: Advised to reduce and/or abstain ^a
Veteran Status	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Men					
Unadjusted	0.98 (0.87-1.11)	1.27 (1.13-1.41)	1.42 (1.27-1.59)	1.21 (1.08-1.37)	0.73 (0.60-0.88)
Adjusted *	1.27 (1.10-1.47)	1.49 (1.31-1.71)	1.80 (1.57-2.07)	1.38 (1.20-1.59)	0.85 (0.69-1.04)
Brief intervention outcomes assessed only among male participants reporting any unhealthy alcohol use in the past 30 days					
Unadjusted				1.80 (1.41-2.29)	1.15 (0.85-1.55)
Adjusted *				1.63 (1.23-2.17)	1.09 (0.78-1.51)
Women					
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Unadjusted	1.30 (0.92-1.84)	1.49 (1.05-2.13)	1.40 (1.03-1.92)	1.50 (0.98-2.31)	1.63 (0.64-4.11)
Adjusted *	1.18 (0.80-1.74)	1.27 (0.84-1.91)	1.47 (1.09-1.99)	1.62 (1.06-2.48)	2.16 (0.90-5.17)
Brief intervention outcomes assessed only among female participants reporting any unhealthy alcohol use in the past 30 days					
Unadjusted				1.25 (0.58-2.70)	0.77 (0.31-1.91)
Adjusted *				1.33 (0.60-2.92)	0.51 (0.14-1.92)

Note. Significant values in bold ($p < .05$).

* Adjusted models included age, race, education, marital status, employment status, state residency, lifetime depression diagnosis, and tobacco use.

^a Sample size for this item only included those that answered "yes" to screening items 1, 2, or 3.