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# Does Alcohol Misuse Differ by Veteran and Gender Status for Young and Middle-aged Adults in the General Population?

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## Abstract

**Purpose:** Historically, alcohol misuse has been a problem among veterans. The purpose of this study was to determine whether alcohol misuse differs by veteran and gender status for young adults and middle-aged adults in the general population.

**Methods:** This cross-sectional study used data from the 2016 Behavioral Risk Factor Surveillance System (BRGFSS) for young adults ages 25 to 44 (N=5189) and for middle-aged adults ages 45 to 64 (N=10529) in Alaska, Arizona, Montana, South Dakota, and Wyoming. Ordered logistic regression with combined state data by age group was used to assess whether alcohol misuse differs by veteran and gender status when controlling for health-related and demographic factors.

**Results:** Less than one-fourth of participants reported excessive alcohol use (22% in young adults and 23% in middle-aged adults) and fewer reported veteran status (12% and 9% respectively). In both age groups, veteran males and non-veteran males were more likely to report each successive level of alcohol use when compared to non-veteran females. Alcohol use was also significantly related to tobacco use, physical health, and mental health in both age groups.

**Conclusion:** The results indicate that alcohol use in young and middle-aged adults was related to male gender, tobacco use, physical health, and mental health, and patterns did not differ for age groups. For adults ages 25 to 64 in a primary care setting, providers should continue to screen for alcohol and tobacco use in all adults, especially males, regardless of veteran status and age. Providers should educate patients on the risks of substance use and provide resources for smoking cessation and referrals to substance abuse programs as needed. In addition, because alcohol use is related to physical health and mental health status, providers should screen for all if patients present with any and treat as comorbid conditions.

**Keywords:** Alcohol misuse; Veteran and gender status; Behavior risk factor

## Introduction

Alcohol misuse is a widespread and preventable health issue affecting up to 23 million people in the United States [1]. In addition to substance abuse issues, alcohol misuse is linked to other serious health issues such as high blood pressure, heart disease, stroke, liver disease, digestive problems, some cancers, dementia, and social problems. From 2006 to 2010, alcohol-related illnesses and accidents accounted for an estimated 88,000 deaths each year, including one of every ten adults of working age. Approximately 2.5 million years of life are lost annually from excessive alcohol use, and healthcare costs exceed \$249 billion [1].

Alcohol misuse has historically been a concerning problem among veterans [2,3] and past research indicates that veterans are more likely to misuse alcohol than non-veterans [4]. Although only a few studies include women veterans, there is some evidence that male veterans have higher rates of alcohol misuse than female veterans [2,5,6]. Mental health issues, which veterans experience at higher rates than the general public, also affect levels of alcohol use [7,8]. Demographic factors that are shown to be related to alcohol misuse in veterans are marital status, age [3,4,7], ethnicity/race, income level, employment status and education level [4,7,9].

The historical differences in prevalence of alcohol disorders between veterans and civilians and between genders merit further research to investigate whether veteran and gender status in young and middle-age adults in the general population continue to contribute to alcohol misuse [6]. Thus, this study aims to assess differences in alcohol misuse by veteran and gender status for young and middle-aged adults in the general population.

## Methods

### Design

This cross-sectional analysis used data from the 2016 Behavioral Risk Factor Surveillance System (BRFSS) conducted by the Centers for Disease Control and Prevention [10]. BRFSS is a national survey system that performs annual telephone surveys asking U.S. residents about their health-related risk behavior, chronic health conditions, and use of preventative services in all 50 U.S. states, including the District of Columbia. The CDC compiles all BRFSS data and makes de-identified data available to researchers for secondary data analysis. This study was given exempt status by the Institutional Review Board of The University of North Texas Health Science Center.

### Sample

The samples in this study included adult veteran and non-veteran males and females 25 to 44 years of age (N=5189) and 45 to 64 years of age (N=10529) in Alaska, Arizona, Montana, South Dakota and Wyoming. These states were chosen because they showed larger proportions of veterans and alcohol misuse (binge drinking and heavy drinking) among the 50 states [11].

### Data

For the outcome, alcohol consumption, participants in BRFSS originally reported the average number of alcoholic drinks consumed per day and we categorized this number as “no use (0

drinks per day),” “light use (less than 1 drink per day),” “moderate use (1 to 3 drinks per day females, 1 to 4 drinks per day males),” or “excessive use (4 or more drinks per day females, 5 or more drinks per day males” [12]. For the factor of interest, veteran and gender status, participants of both genders were asked “Have you ever served on active duty in the U.S. Armed Forces, either in the regular military or in a National Guard or a reserve unit?” From responses, we created 4 categories: “non-veteran female,” “veteran female,” “non-veteran male” and “veteran male.”

Control variables include physical health status, mental health status, tobacco use, educational level, employment status, income level, and marital status. Physical health status was measured as “low” (0-16 days), “moderate” (17-29 days), and “high” (30 days) levels of physical health in the past 30 days. Mental health status was measured as “30 days of good mental health” versus “less than 30 days” in the past 30 days. Tobacco use was measured as “yes” or “no” for current smoker. Educational level was categorized as “some/graduated high school,” “graduated high school,” “some college or technical school,” and “graduated college or technical school.” Employment status was categorized as “employed,” “retired,” and “other.” Income was categorized as “less than \$25,000,” “\$25,000 to less than \$50,000,” and “50,000 or more.” Because most of the participants reported White race, we measured race/ethnicity as “white, non-Hispanic” versus “other.” Marital status was categorized as “yes” or “no” for being currently married. Descriptive statistics and categories for all variables are shown in **Table 1**.

**Table 1:** Participants characteristics by age groups.

Variables	Ages 25-44 (N=5189)		Ages 45-64 (N=10529)	
	N	%	N	%
Alcohol use	5189	100	10529	100
No use	1997	38	4723	45
Light	911	18	1637	16
Moderate	1144	22	1771	17
Excessive	1137	22	2398	23
Veteran and gender status	5189	100	10529	100
Non-veteran female	2651	51	5686	54
Veteran female	88	2	197	2
Non-veteran male	2097	40	3582	34
Veteran male	353	7	1064	10
Physical health status	5145	100	10411	100
Low	441	9	1604	15
Moderate	1292	25	2285	22
High	3412	66	6522	63
Mental health status	5186	100	10529	100

30 days in the past 30 days	3210	62	7303	69
Less than 30 days in the past 30 days	1976	38	3226	31
Tobacco use	5004	100	10277	100
Smoker	1068	21	1819	18
Nonsmoker	3936	79	8458	82
Educational level	5180	100	10534	100
Some/graduated high school	1576	30	3328	31
Some college or technical school	1569	30	3331	32
Graduated college or technical school	2035	40	3875	37
Employment status	5156	100	10494	100
Employed	3953	76	6908	66
Retired	25	1	1373	13
Other	1178	23	2213	21
Income level	4648	100	9261	100
0 to less than \$25,000	981	21	2038	22
\$25,000 to less than \$50,000	1171	25	2055	22
\$50,000 or more	2496	54	5168	56
Ethnicity/race	5130	100	10390	100
White, non-Hispanic	3700	72	8423	81
Other	1430	28	1967	19
Marital status	5194	100	10553	100
Married	2997	58	6582	62
Not married	2197	42	3971	38

## Analysis

Data was combined for the five states because of small n's for female veterans by state. Frequency distributions were generated for each variable by age group (young adult and middle-aged adult) to describe the participants and to identify any issues with the distributions of variables. Ordered logistic regression analyses by age group were conducted to assess the relationship between alcohol misuse and veteran and gender status after controlling for health-related and demographic factors. An ordered logistic regression model is used to estimate a relationship between an ordinal dependent variable and a set of independent variables. The proportional odds produced for each IV relates "proportionally" or equally applies to comparisons of DV groups greater than k versus those who are in groups less than or equal to k, where k is any level of the response variable. Therefore, the interpretation of an associated OR is that for a one unit change in the predictor variable, the odds for a group that is greater than k versus less than or equal to k are the proportional odds times larger. Any observations with missing data for any variables were excluded from the adjusted analysis. All analyses were conducted in STATA 15 (Copyright 1985-2017 StataCorp LLC).

## Results

### Descriptive statistics

**Table 1** shows participant characteristics from combined state data for young adults (25 to 44 years of age) and middle-aged adults (45 to 64 years of age). For young adults, about two-thirds of participants reported alcohol use (62%), with less than one-fourth reporting excessive alcohol use (22%). Most participants were non-veteran females (51%) or males (40%). Regarding health, the majority of participants reported high physical health (66%) and good mental health (62%), and most reported no tobacco use (79%). For demographic factors, over one-third reported graduating college or technical school (40%), most reported being currently employed (76%), and about half reported an annual income level of \$50,000 or more (54%). In addition, most reported being white, non-Hispanic (72%) and over half were married (58%).

For middle-aged adults, less than half of participants reported no alcohol use (45%), and about one-fourth reported excessive alcohol use (23%). Most participants were non-veteran females (54%) or males (34%). Regarding health, the majority of participants reported high physical health (63%) and good

mental health (69%), and most participants reported no tobacco use (82%). For demographic factors, about one-third of the participants reported graduating college or technical school (37%), and the majority reported being currently employed (66%) and having an annual income level of \$50,000 or more (56%). In addition, the majority of participants reported being white, non-Hispanic (62%) and married (58%).

### Adjusted statistics

**Table 2** shows the adjusted results by age group for young adults (25 to 45 years of age) and middle-aged adults (45 to 64 years of age). For young adults, the results of ordered logistic regression indicated that after controlling for all other variables

in the model, alcohol use was related to veteran and gender status. Both veteran and non-veteran males were about 2 times more likely to report each successive level of alcohol use when compared to non-veteran females. Veteran females did not differ from non-veteran females or from veteran or non-veteran males (as denoted by the overlapping 95% confidence intervals). In addition, participants who reported moderate or high physical health were about 1.5 times more likely to report each successive level of alcohol use. Furthermore, smokers were about 1.5 times more likely to report each successive level of alcohol use. In contrast, participants with good mental health were about 1.5 times less likely to report each successive level of alcohol use.

**Table 2:** Adjusted results by age groups.

Model Predicting Alcohol Use (none vs. light vs. moderate vs. excessive)*	Ages 25-44			Ages 45-64		
	AOR	95% CI		AOR	95% CI	
		Low	High		Low	High
Veteran and gender status						
Non-veteran female	Ref	-	-	Ref	-	-
Veteran female	1.08	0.73	1.59	1.08	0.81	1.44
Non-veteran male	1.75	1.55	1.98	1.6	1.47	1.75
Veteran male	1.91	1.53	2.38	1.34	1.18	1.53
Physical health status						
Low	Ref	-	-	Ref	-	-
Moderate	1.37	1.09	1.73	1.68	1.45	1.95
High	1.47	1.18	1.83	1.96	1.71	2.26
Mental health status						
30 days in the past 30 days	Ref	-	-	Ref	-	-
Less than 30 days in the past 30 days	0.77	0.68	0.86	0.88	0.8	0.96
Tobacco use						
Nonsmoker	Ref	-	-	Ref	-	-
Smoker	1.61	1.39	1.86	1.38	1.23	1.54

\*Models also included education level, employment status, income level, race/ethnicity, and marital status.

For middle-aged adults, the results of ordered logistic regression indicated that after controlling for all other variables in the model, alcohol use was related to veteran and gender status. Veteran and non-veteran males were about 1.5 times more likely to report each successive level of alcohol use when compared to non-veteran females. Veteran females did not differ from non-veteran females or from veteran or non-veteran males (as denoted by the overlapping 95% confidence intervals). In addition, participants who reported moderate or high physical health were about 2 times more likely to report each successive level of alcohol use. Furthermore, current smokers were about 1.5 times more likely to report each successive level of alcohol use. In contrast, participants with good mental health were

about 1.15 times less likely to report each successive level of alcohol use.

## Discussion

The purpose of this study was to assess differences in alcohol misuse by gender and veteran status in young adults (ages 25 to 44) and middle-aged adults (ages 45 to 64) in the general population. Overall, relations between veteran and gender status and alcohol use did not differ by age group. Our study showed that veteran and non-veteran males ages 25 to 64 were about 1.5 to 2 times more likely to report each successive level of alcohol use when compared to female non-veterans. There were no differences in alcohol use between veteran females and

the other groups. A previous study examining gender and veteran status found similar results indicating that male non-veterans and male veterans were more likely to report alcohol use compared to female non-veterans [13]; however, that study did not report their results by age group and used different variables to measure alcohol use. Our results differ from another study which found that older age in veterans was related to higher levels of heavy alcohol use as well as any alcohol use compared to non-veterans [4]; however, that research used males only with different comparison groups and different variables to measure alcohol use. Along with the Goodell et al. study [13], our results may support the decline in alcohol misuse among US veterans when compared to civilians [6] with female veterans not differing from males or non-veteran females.

The results of this study were also similar by age group for physical health, mental health, and tobacco use. For physical health, young adults and middle-aged adults who reported moderate or high physical health were about 1.5 to 2 times more likely to report each successive level of alcohol use when compared to those who reported low physical health. Conversely, young adults and middle-aged adults who reported no mental health issues were about 1.15 to 1.5 times less likely to report each successive level of alcohol use. Previous research [14] found similar results for physical health but opposite finding for mental health. The differences may be attributed to differing target populations: our study focused on the general population in the U.S. and prior research utilized working class males in Russia [14]. In addition, our study found that across age groups smokers were about 1.5 times more likely than non-smokers to report each successive level of alcohol use, which is similar to the results of prior research [13].

## Limitations

Using the BRFSS data allowed us to have a larger and more diverse sample for our analyses. However, veteran females made up a small proportion of this data (1%-2%). Future studies should aim to include more female veterans. Furthermore, this data was collected by telephone survey, which may allow for mis-recollection or social desirability bias, both of which could potentially limit the reported levels of drinking. In addition, we did not have data related to physical and sexual violence, PTSD, or suicidal ideations, which have been previously, linked to higher rates of alcohol use in other studies relating to veterans [15] and non-veterans [16].

## Conclusion

The results of this population-based study may be generalizable to veteran and non-veteran adults ages 25 to 64 in primary care settings. Providers may expect up to one-fourth of patients in this target population to report excessive alcohol use, and that successive levels of alcohol use are related to gender but not to veteran status. Primary care practitioners should continue automatic screening for alcohol use in adults ages 25 to 64 [17], especially for males and regardless of veteran status and age; educate patients about the health risks of excessive alcohol use; and provide referrals to substance abuse treatment

as needed. In addition, practitioners may expect up to one-third of adults ages 25 to 64 to report low to moderate physical health, mental health issues, or tobacco use, but that these may be moderately related to successive levels of alcohol use. Therefore, providers should screen for all if patients in this target population present with any, assess and coordinate treatment plans for comorbid conditions, and provide resources for smoking cessation.

## References

1. <https://www.cdc.gov/alcohol/fact-sheets/alcohol-use.htm>
2. Cianflone CNF, Powell TM, Leardmann CA, Russell DW, Boyko EJ, et al. (2016) Mental health and comorbidities in U.S. military members. *Mil Med* 181: 537-545.
3. Larson MJ, Wooten NR, Adams RS, Merrick EL (2012) Military combat deployments and substance use: Review and future directions. *J Soc Work Pract Addict* 12: 6-27.
4. Bohnert ASB, Ilgen MA, Bossarte RM, Britton PC, Chermack ST, et al. (2012) Veteran status and alcohol use in men in the United States. *Mil Med* 177: 198-203.
5. Bray RM, Brown JM, Williams J (2013) Trends in binge and heavy drinking, alcohol related problems and combat exposure in the U.S. military. *Subst Use Misuse* 48: 799-810.
6. Lan CW, Fiellin DA, Barry DT, Bryant KJ, Gordon AJ, et al. (2016) The epidemiology of substance use disorders in U.S. veterans: A systematic review and analysis of assessment methods. *Am J Addict* 25: 7-24.
7. Karpayak VM, Biernacka JM, Geske JR, Abulseoud OA, Brunner MD, et al. (2016) Gender-specific effects of comorbid depression and anxiety on the propensity to drink in negative emotion states. *Addict* 111: 1366-1375.
8. Sparrow K, Kwan J, Howard L, Fear N, MacManus D, et al. (2017) Systematic review of mental health disorders and intimate partner violence victimisation among military populations. *Soc Psychiatry Psychiatr Epidemiol* 52: 1059-1080.
9. Feuhrlein BS, Mota N, Arias AJ, Trevisan LA, Kachadourian LK, et al. (2016) The burden of alcohol use disorders in US military veterans: Results from the national health and resilience in veterans study. *Addict* 111: 1786-1794.
10. <https://www.cdc.gov/brfss/about/index.htm>
11. [https://www.cdc.gov/brfss/data\\_tools.htm](https://www.cdc.gov/brfss/data_tools.htm)
12. <https://www.cdc.gov/alcohol/faqs.htm>
13. Goodell HE, Van Noy AE, Zarker KM, Kotulek SR, Diver TE, et al. (2017) Does alcohol misuse differ by gender and veteran status in adults ages 25 and older? *J Prev Med* 3: 7.
14. Dissing AS, Gil A, Keenan K, McCambridge J, McKee M, et al. (2013) Alcohol consumption and self-reported (SF12) physical and mental health among working-aged men in a typical Russian city: A cross-sectional study. *Addict* 108: 1905-1914
15. Ziobrowski H, Sartor CE, Tsai J, Pietrzak RH (2017) Gender differences in mental and physical health conditions in U.S. veterans: Results from the national health and resilience in veterans study. *J Psychosom Res* 101: 110-113.
16. Ford JD, Hartman JK, Hawke J, Chapman JF (2008) Traumatic victimization, posttraumatic stress disorder, suicidal ideation and

- substance abuse risk among juvenile justice-involved youth. *J Child Adol Trauma* 1: 75-92.
17. <https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/alcohol-misuse-screening-and-behavioral-counseling-interventions-in-primary-care?ds=1&s=alcohol%20use>