

Alcohol Misuse Among Military Veterans with Subjective Cognitive Decline

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Abstract

Although binge drinking has been identified as a significant risk factor for the development of cognitive decline, much less attention has been paid to binge drinking among patients already experiencing cognitive decline. Given that military veterans in the general population are more likely to engage in unhealthy alcohol consumption, we hypothesised that veteran–nonveteran disparities in binge drinking may also extend to patients with subjective cognitive decline (SCD). We analysed data on alcohol misuse from the 2016–2018 Behavioral Risk Factor Surveillance System on a sample of veterans and nonveterans (aged ≥ 78 years) with and without SCD ($n = 10\,063$). In a logistic regression model adjusting for relevant covariates, an interaction term showed that the odds of binge drinking were higher for military veterans with SCD than nonveterans with SCD, nonveterans with SCD and veterans without SCD (aOR = 2.19 [95% CI = 1.04, 4.71]). Given the prevalence of binge drinking (5%) among military veterans with SCD, there is a need to simultaneously screen for binge drinking and SCD among older military veterans in healthcare settings.

Keywords: veterans; cognitive decline; alcohol

Introduction

Subjective cognitive decline (SCD), which is a self-reported condition of worsening memory loss or confusion within 12 months, has been described as an early symptom of Alzheimer’s disease.¹ Individuals with SCD may perceive a decline in their cognitive abilities, such as memory, attention or problem-solving skills. Unlike objective measures of cognitive decline, which are typically measured through standardised neuropsychological tests or imaging, SCD relies on an individual’s own assessment of their cognitive functioning.

SCD can be an important early indicator of potential cognitive impairment or the onset of neurodegenerative conditions like Alzheimer’s disease. While it’s essential to recognise that SCD does not, by itself, confirm cognitive impairment, it serves as a valuable starting point for further evaluation and intervention. Healthcare professionals often use SCD assessments to better understand a patient’s cognitive concerns, track changes over time and decide whether more comprehensive cognitive testing is necessary.

Taylor and colleagues² found that military veterans are at greater risk for SCD than nonveteran civilians, a disparity that may be due—in part—to certain SCD risk factors that are especially akin to military

service, such as traumatic brain injury.³ Other behavioural risk factors for SCD, such as binge drinking, cigarette use and frequent mental distress, are also more common among military veterans.^{4–6}

Although binge drinking—due to its neurotoxicity⁷—has been validated as a significant risk factor for dementia in systematic reviews,⁸ binge drinking among individuals who are already experiencing SCD is less studied. As suggested by Berntsen et al.,⁹ little work has looked at the alcohol use behaviours of individuals who exhibit cognitive decline. To the extent that brain function could be changed due to the interaction between disease-related processes and alcohol use, many of the deficits that accompany cognitive decline may become exacerbated in the event of intoxication, including greater memory and learning deficits, as well as lethargy and problems concentrating.¹⁰ Furthermore, Heymann and colleagues¹¹ found that alcohol consumption may hasten the rate of cognitive decline once it begins.

Given the possible adverse effects of binge drinking on individuals with cognitive decline, it is important to identify groups of cognitively declining individuals with high rates of binge drinking. Identification of at-risk groups could guide the implementation of screening and intervention programs for these populations. Because little is known about disparities in binge drinking among veterans and nonveterans

with cognitive decline, and veterans have been shown to have higher rates of binge drinking than the general population,¹² this study aimed to determine differences in binge drinking among older military veterans and nonveterans with and without SCD between 2016 and 2018.

Materials and methods

Data collection and study sample

In this cross-sectional study, we obtained and merged data from the 2016 to 2018 Behavioral Risk Factor Surveillance System (BRFSS) surveys.¹³ The Centers for Disease Control and Prevention's BRFSS is conducted yearly with adults via landline or cellular telephones in all 50 states in the United States, as well as in the District of Columbia, Puerto Rico and Guam. In 2016, 2017 and 2018, respectively, landline-based interviews resulted in 48%, 45% and 53% response rates, while cellular telephone-based interviews resulted in 46%, 45% and 43% response rates. Each state/territory used a disproportionate stratified sampling design in order to collect data from landlines, with state/territory respondents divided into two groups: high density and medium density, where the number of listed households in an area code determines density. A simple random sampling design was used to gather data via cellular telephone.¹⁴

Individuals included in this study were survey respondents ≥ 78 years old (a key age at which Alzheimer's is diagnosed)¹⁵ who provided an answer to the following question, designed to assess SCD: 'Have you experienced confusion or memory loss that is happening more often or is getting worse?' Data from a total of 10 063 participants were collected in the 2016–2018 BRFSS surveys.

Measures

Numerous studies have documented the validity and reliability of questions asked in the BRFSS survey.¹⁶ In this study, we used information about each respondent's age in years (≥ 78 years), race/ethnicity (white, black and 'other' race/ethnicity), sex (male or female) and urban/rural dwelling location (urban/metropolitan statistical area or rural/not in a metropolitan statistical area). We determined military service status (civilian or military member) with the following 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 (yes or no)?'

Mental distress was measured by: 'Now thinking about your mental health, which includes stress, depression and problems with emotions, for how many days during the past 30 days was your mental health not good?' Although some research has dichotomised responses to this question,¹⁷ we left the variable as a continuous measure of mental distress. We also obtained the CDC BRFSS calculated variable for the current use of combustible cigarettes.

The dependent variable in this study was binge drinking. Binge drinking was defined as self-reported consumption of five or more drinks of alcohol on one occasion for males and four or more drinks of alcohol on one occasion for females (i.e., coded dichotomously). These thresholds are consistent with US Centers for Disease Control and Prevention guidance.¹⁸

Data analysis

We used the BRFSS complex survey design weights, the methodology for which is described elsewhere,¹⁹ in all analyses. Weighted prevalence estimates with 95% confidence intervals for binge drinking were developed. We also calculated weighted prevalence estimates of binge drinking by veteran and SCD status. To examine adjusted differences in binge drinking by veteran and SCD status, we estimated a logistic regression model. In this model, we controlled for age, race/ethnicity, sex, rural/urban location, mental distress and smoking status. Adjusted odds ratios with 95% confidence intervals are presented.

Results

Demographic characteristics of the study sample can be found in Table 1. Participants were aged 78, 79 or 80 years, which helps to control for lifetime cumulative exposures and risk factors in the current study. White was the predominant self-reported race, followed by black and other individuals. Females were more represented in the nonveteran sample than the veteran sample. Cigarette use was reported by approximately 4% of the sample among veterans and nonveterans. Among veterans and nonveterans, approximately one-third of participants lived in a rural area. Participants reported approximately 2 days of poor mental health, on average, in the previous month. The following is a list of 20 states in which respondents reported living, all of which garnered sample sizes ≥ 100 : Alaska, Delaware, Georgia, Hawaii, Idaho, Indiana, Kentucky, Massachusetts, Mississippi, Missouri, Montana, New Hampshire, New Jersey, New Mexico, North Carolina, Oregon, Pennsylvania, Tennessee, Vermont and Washington. This study included 1 125 (19.86%) military veterans.

Table 1. Demographic characteristics of veteran and nonveteran participants aged ≥78 years (n = 10 063)

Variable	Nonveteran (n = 7646)		Veteran (n = 2417)	
	n	%	n	%
Race				
White	6698	87.60	2174	89.95
Black	386	5.05	65	2.69
Other	562	7.35	178	7.36
Sex (female)	6693	87.54	99	4.10
Rural	2605	34.07	766	31.69
Current Cigarette use	340	4.44	97	4.01
Subjective Cognitive Decline	926	12.11	440	18.20
	M	SD	M	SD
Days of poor mental health	2.04	6.13	1.83	6.21

Regarding binge drinking, results showed that those with SCD had higher binge drinking rates (2.69% ± 0.74) than those without SCD (1.94% ± 0.19), ignoring veteran status. Veterans had higher binge drinking rates (3.19% ± 0.01) than nonveterans (1.64% ± 0.01), ignoring SCD status. The introduction of the veteran status variable with SCD added additional variability in binge drinking rates. Binge drinking rates were highest among veterans with SCD (4.98% ± 0.16), followed by veterans without SCD (2.81% ± 0.04), nonveterans without SCD (1.65% ± 0.01), and nonveterans with SCD (1.58% ± 0.08).

Results of logistic regression models for binge drinking by veteran and SCD status are shown in Table 2. After adjusting for confounding factors, such as race/ethnicity, age, sex, rural/urban location, mental distress and smoking status, results showed that an interaction term for veteran status and SCD status was significantly associated with binge drinking (aOR = 2.18 [95% CI = 1.04–4.71]). The results of the model reinforce the differences in binge drinking rates described in the previous paragraph.

Table 2. Adjusted odds ratios for risk factors for binge drinking among veterans and nonveterans with and without subjective cognitive decline, 2016–2018

Variable	aOR	95% CI	aOR	95% CI
Race/ethnicity				
White	Ref		Ref	
Black	1.78	1.04–2.89	1.81	1.06–2.93
Other	1.67	1.10–2.45	1.68	1.11–2.46
Sex (female)	0.27	0.19–0.42	0.27	0.18–0.39
Rural location	0.86	0.63–1.17	0.86	0.63–1.17
Days of poor mental health	0.99	0.97–1.02	0.99	0.97–1.02
Current use of cigarettes	3.39	2.17–5.11	3.41	2.19–5.13
Subjective Cognitive Decline (SCD)	1.26	0.85–1.82	0.85	0.46–1.46
Veteran	0.78	0.54–1.15	0.68	0.45–1.01
Interaction: Veteran x SCD			2.18	1.04–4.71

Note. aOR = adjusted odds ratio; Ref = reference category

Discussion

The primary finding of this study concerns the identification of a disparity in binge drinking behaviour among military veterans and nonveterans who have SCD. Specifically, the results of this study showed that veteran and SCD status, combined, was associated with a greater likelihood of binge drinking. The disparities discovered in this report mirror disparities in populations of veterans and nonveterans without SCD.²⁰

Because (a) Taylor et al.² found that veterans are at greater risk for SCD and (b) binge drinking following a diagnosis of cognitive decline can accelerate mental deterioration, including worsening memory loss or confusion, there is a need to identify heavy alcohol consumption or binge drinking and SCD early among military veterans. Some research has shown that identification of early cognitive decline can be done using screening tools, such as the Short Blessed Test, in emergency departments.²¹

Brief interventions to improve memory function in positively screened SCD patients may also be efficacious.²² Because screening and brief intervention (SBI) programs have been successful in identifying and treating behavioural health issues in military veterans,^{23,24} adapted SBI programs for cognitive decline may also be beneficial. For example, Cahn-Weiner et al.²² found that a brief intervention for mildly impaired Alzheimer's disease patients resulted in modest gains in recognition of test material and recall of test material from training sessions over 6 weeks.

Binge drinking can accelerate natural brain aging and exacerbate underlying biological mechanisms known to contribute to cognitive decline. The following discussion provides a speculative mechanism underlying the hypotheses tested in this study and the implications of the results. Binge drinking causes sleep disturbances that perturb the glymphatic clearance of neurotoxic proteinopathies, leading to their accumulation and aggregation.²⁵ Furthermore, chronic alcohol consumption increases the chance of cardiovascular disease,²⁶ which is a midlife risk factor for cognitive decline.²⁷ When mental health issues are coupled with binge drinking, such as in the case of military veterans, cognitive deficits are often the long-term neurological consequences of inadequate interventional strategies. As such, a multimodal approach that addresses heavy alcohol consumption or binge drinking coupled with a combination of pharmacotherapeutic approaches may be needed to ameliorate cognitive decline.

Given the relatively high prevalence of binge drinking among military veterans with SCD, there is a need to screen for binge drinking and SCD simultaneously among military veterans. SBIs for binge drinking have been efficacious in reducing alcohol consumption among military veterans.²³ However, access to such interventions is limited in rural areas of the United States.²⁴ Implementing telehealth care delivery methods in screening and brief intervention programs for military veterans living in rural areas may provide a means of overcoming access issues.²⁸

Some limitations accompanied the analysis of data in this study. First, data in this study were self-reported by individuals who testified to their experience of cognitive decline. As such, the results of this study may suffer from recall bias. Second, the cross-sectional nature of this report's study design precludes the possibility of making conclusions about causal relationships. Future longitudinal research is needed to see if alcohol use behaviours change over time differently between veterans and veterans as they move from full cognitive function to a state of cognitive deterioration. Third, given that the survey questions in this report concerned sensitive topics (i.e., alcohol consumption at unhealthy levels, potential cognitive decline), it is possible that social desirability bias resulted in underreporting of problematic alcohol consumption or SCD. Fourth, although we were unable to confirm, it is possible that the same participant could have taken the BRFSS survey over multiple years. Fifth, we were unable to ascertain the lifetime or cumulative consumption of alcohol. Sixth, the BRFSS did not include a variable about the length of military service.

To conclude, based on a search of articles indexed in PubMed, this is the first study to examine veteran–nonveteran disparities in binge drinking among individuals with SCD. The results of this study showed that veteran and SCD status was associated with a greater likelihood of engaging in binge drinking. Screening and brief interventions are needed to identify and rapidly treat SCD and binge drinking in this population. Future research, especially projects that seek to identify reasons for binge drinking among veterans with SCD, is needed to better tailor interventions. Furthermore, studies that examine the experience of women veterans,²⁹ the role of psychological resilience on health behaviours,³⁰ and other reintegration outcomes,³¹ may provide additional insight on the matters explored in this study.

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