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Exploring Racial/Ethnic Disparities in Substance Dependence and Serious Psychological Distress among US Veterans

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Abstract

Objectives—There are substantial racial/ethnic disparities in substance use and mental health among civilian populations, but few studies have examined these disparities in veterans using a nationally representative sample. Thus, we examined differences in substance dependence and serious psychological distress (SPD) by race/ethnicity among a national sample of US veterans.

Methods—We pooled cross-sectional data from the 2015–2019 waves of the National Survey on Drug Use and Health (N = 7,653 veterans aged 18–64 years). Regression models were utilized to examine racial/ethnic differences in *DSM-IV* substance dependence and SPD with a Benjamini–Hochberg correction applied.

Results—Compared to non-Hispanic White veterans: American Indian/Alaska Native veterans had significantly higher odds of past-year alcohol dependence (AOR = 2.55, 95% CI: 1.28, 5.08); Asian American veterans had significantly lower odds of past-year alcohol dependence (AOR = 0.12, 95% CI: 0.02, 0.62); non-Hispanic Black (AOR = 0.60, 95% CI: 0.48, 0.77), Hispanic (AOR = 0.47, 95% CI: 0.34, 0.65), and veterans of more than one race (AOR = 0.55, 95% CI: 0.36, 0.83) had significantly lower odds of past-month nicotine dependence; Asian American veterans had significantly lower odds of past-year illicit drug dependence (AOR = 0.05, 95% CI: 0.01, 0.35);

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Ethical Approval Ethical approval was waived by the local Ethics Committee of the University at Buffalo, a State University of New York given the retrospective nature of the study.

Consent for Participate All participants provided informed consent regarding their data from the study.

Competing Interests The authors have no competing interests to declare that are relevant to the content of this article.

and non-Hispanic Black veterans had significantly lower odds of past-year SPD (AOR = 0.69, 95% CI: 0.55, 0.85) after correction for multiple comparisons.

Conclusion—Overall, racial/ethnic disparities in substance dependence and SPD among veterans are not as stark as in civilian populations, but some disparities remain.

Keywords

Veterans; Psychological distress; Alcohol dependence; Nicotine dependence; Illicit drug dependence; Racial disparities

Introduction

In the United States, substance use disorders (SUDs) and serious psychological distress (SPD) have taken a substantial economic toll that exceeds $400 billion annually in lost job productivity, healthcare expenses, and criminal justice costs[1, 2]. SPD (which includes depression and anxiety symptoms collectively) is particularly concerning given that multiple epidemiological studies have associated it with an increased risk of mortality[3–5]. Veterans are a population that disproportionately experience SPD (particularly posttraumatic stress disorder) and SUDs [6]. Notably, more than one-third of VA inpatient clients screen positive for SUDs and SPD with SUDs being the most prevalent as well as costly health condition among veterans [6–8]. The interrelationship of SUDs and SPD has been linked to other etiological risk factors such as poor socioeconomic status, vulnerability, behavioral problems, and discrimination [9]. Substance use can also mediate maladaptive coping among those dealing with certain military experiences (e.g., combat-exposure), militaryrelated mental health problems, and those transitioning back to civilian life[10]. Given these etiological risk factors, racial/ethnic minoritized veterans may be at a greater risk of SUDs and SPDs due to the confluence of military experiences, structural/interpersonal racism, barriers to treatment (such as stigma, treatment utilization, and access), and intergenerational/historical trauma [11–18].

Impact of Racial/Ethnic Disparities in Military Service

While there have been significant improvements in race relations in the military since prior decades, systematic review data indicates that individual and institutional racism persists [16]. More recently, the 2017 Workplace and Equal Opportunity Survey of Active Duty Members determined that 31.2% of Black/African American, 23.3% of Asian American, and 21% of Hispanic service members reported experiencing individual racial discrimination [14]. Furthermore, American Indian or Alaska Native (AI/AN) veterans are less likely to have health insurance relative to non-Hispanic White veterans [19]. Prior research has suggested that this disparity is attributable to factors such as racial discrimination, cultural misunderstandings, and transportation barriers [20–25]. One study explored the theory of tokenism in the Army in which they noted that when a group is a numerically under-represented minority (token), they experience certain disadvantages such as higher visibility, informal isolation, and role restriction [26]. Black service members are under-represented and Hispanic service members are over-represented among Marine Corps recruits. In addition, the Coast Guard has the greatest percentage of White recruits compared to all

other military branches [27]. Moreover, over 70% of higher rank positions such as general officers, and all other officers are disproportionately held by White Americans [27].

The implications of racial discrimination in the military have led to longstanding inequities in military experience, risk behaviors, and healthcare issues such as SUDs and SPD experienced by service members of color [14, 28, 29]. Additionally, there is a strong correlation between racial/ethnic discrimination, coping mechanisms, and SPD [21, 30–32]. A longitudinal study of Marine recruit training experience and race-based discrimination (RBD) revealed that RBD was negatively associated with self-esteem, social support, and physical and mental health problems [29]. These issues may be further exacerbated by inadequate cultural competency training at Veterans Administration (VA) hospitals [18].

Racial/Ethnic Differences in Substance Use Disorder (SUD) Among Veterans

In veteran populations, SUDs are a major public health concern with alcohol and nicotine dependence being the most common type of SUDs [33, 34]. Numerous factors such as a stigma toward SUD treatment utilization[15, 35, 36], and the lasting negative psychological effects of combat exposure [37–40] have been attributed. Notably, few studies have examined racial/ethnic disparities in SUDs with nationally representative data that includes Asian Americans and AI/AN veterans. A cross-sectional study examining racial/ethnicity differences among Iraq and Afghanistan veterans seen at the VA hospital found that AI/AN veterans were more likely to be diagnosed with SUDs relative to non-Hispanic White veterans [41]. The researchers also noted that Asian American veterans were less likely to be diagnosed with SUDs relative to non-Hispanic White veterans [41]. Some studies examining VA data found Black veterans were significantly less likely to screen positive for an alcohol use disorder (AUD) than non-Hispanic White and Hispanic veterans [42, 43], whereas other VA studies observed that Black veterans had the highest rates of AUD [33, 44]. Notably, a VA study comparing Black and non-Hispanic White smoking cessation rates observed that Black veterans had significantly higher quit rates, which starkly differs from the disparities observed in the general population [45–48]. It must be noted that many of these studies have limited generalizability given that they sampled participants from the VA population or they relied on a sample from a single state’s population [6, 44, 45, 49, 50]. This is important given that many veterans seek healthcare from the private sector and may have notable sociodemographic differences from VA veterans [51].

Racial/Ethnic Differences in Serious Psychological Distress (SPD) Among Veterans

SPD is largely understudied in the veteran literature even though epidemiological studies have linked it with an increased risk of mortality in civilian studies [3, 4]. There are notably few studies that examine racial/ethnic disparities in SPD among US veterans. A nationally representative cross-sectional study examining sociodemographic risk factors for SPD found that Hispanic and non-Hispanic White veterans were at a higher risk for SPD relative to Black veterans [52]. A cross-sectional study with a nationally representative sample of veterans observed that Black and Hispanic veterans who indicated that they experienced SPD were less likely to receive mental health treatment in the past year [6]. However, a cross-sectional study of veterans based in Texas found Black and Hispanic American

veterans were three times more likely to access mental health treatment than their civilian counterparts [53].

More broadly, the literature on mental health disparities in Asian American veterans is limited as well as mixed with some studies suggesting that they have higher rates of mental health disorders and underutilization of treatment compared to other racial/ethnic groups [54, 55] whereas other studies have noted no significant differences in mental health service utilization or perceived barriers to treatment [56]. A retrospective study of Afghanistan and Iraq war veterans found that Asian American veterans were diagnosed with mental health disorders at lower rates than non-Hispanic White veterans [41]. Similarly, a small cross-sectional study of Afghanistan and Iraq war veterans residing in Hawaii noted that Asian American veterans were significantly less likely to screen positive for PTSD relative to non-Hispanic White veterans [57]. Prior nationally representative cross-sectional studies have noted that AI/AN veterans experience greater levels of combat exposure, and self-report poorer physical and mental outcomes relative to non-Hispanic White veterans [24, 58, 59]. A cross-sectional study of Iraq and Afghanistan veterans seen at the VA hospital found that AI/AN male veterans reported the most mental health disorders and at higher rates relative to non-Hispanic White male veterans [41]. To date, however, there remains a dearth of research on SPD in Asian American and AI/AN veterans.

Research Study Goals

To our knowledge, no studies have examined racial/ethnic disparities in SUDs and SPD among military veteran populations using a nationally representative sample including Asian American and AI/AN veterans. The heavy focus on VA veteran population studies may not entirely describe the SUD and mental health needs of the general veteran population. This study aimed to address this gap by using data from the National Survey on Drug Use and Health (NSDUH) to achieve the following research goals: (1) examine the prevalence of SUDs and SPDs among US veterans, (2) explore racial/ethnic disparities of SUDs among US veterans, and (3) explore racial/ethnic disparities of SPDs among US veterans. Although the *Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV)* uses the diagnoses of abuse and dependence, this work focuses solely on dependence since it is more consistent with current definitions of SUDs [60, 61]. When comparing the DSM-V's SUD criteria to the DSM-IV's abuse/dependence criteria, abuse represents a milder SUD, whereas dependence represents a more severe SUD. Even though we use the term SUD, in this manuscript, we define SUDs as past year alcohol dependence, past month nicotine dependence, and past year illicit drug dependence per the DSM-IV 12-month dependence criteria.

Methods

Data Source

We used pooled cross-sectional data from the waves (2015–2019) of the NSDUH, a nationally representative, yearly cross-sectional survey of the US noninstitutionalized population that has been administered annually since 1990 [62]. Data was collected in-person via audio computerassisted self-interviewing on designated NSDUH laptop devices.

NSDUH surveys 2015, 2016, 2017, 2018, and 2019 had the following weighted response rates: 70%, 68%, 67%, 67%, and 65% respectively.

Participants

In the present study sample (N = 7,653), we included adults aged 18 – 64 years with known veteran status. 863 individuals were excluded from this final sample due to not knowing their veteran status (n = 8), refusing to answer the veteran status question (n = 6), or currently serving in a military reserve component (n = 854).

Measures

Past-Year Alcohol Dependence—The NSDUH uses validated questions designed to measure alcohol dependence and are consistent with the *DSM-IV* [63, 64]. To screen positive for alcohol dependence, survey respondents had to endorse three or more of the following criteria by answering yes/no to the prompts: (1) A need for markedly increased amounts of alcohol to achieve intoxication or desired effect/markedly diminished effect with continued use of the same amount of alcohol, (2) Alcohol is taken to relieve or avoid withdrawal symptoms, (3) Alcohol is often taken in larger amounts or over a longer period than was intended, (4) There is a persistent desire or there are unsuccessful efforts to cut down or control alcohol use, (5) A great deal of time is spent in activities necessary to obtain alcohol, use alcohol or recover from its effects, (6) Important social, occupational, or recreational activities are given up or reduced because of alcohol use, (7) Alcohol use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the alcohol. This measure has demonstrated superb reliability and validity in multiple studies and racially/ethnically diverse samples [65–68].

Past-Month Nicotine Dependence—Past-month nicotine dependence was assessed by survey respondents' responses to a series of prompts from two validated measures, the Nicotine Dependence Syndrome Scale (NDSS) [69] and the Fagerstrom Test of Nicotine Dependence (FTND) [70]. Survey respondents were classified as nicotine dependent if they met the criteria for either the NDSS or the FTND. Past year nicotine dependence is not measured in the NSDUH. The FTND is a valid and reliable measure of nicotine dependence that has been administered to diverse samples [71–75]. Similarly, the NDSS is a valid and reliable measure of nicotine dependence in veterans and racially diverse samples [76–82].

Past-Year Illicit Drug Dependence—The NSDUH uses validated questions developed to evaluate dependence consistent with the *DSM-IV* [63, 83]. For prescription drugs, inhalants, and illicit drugs, survey respondents had to report a positive response to three or more of the following criteria: (1) Spent a great deal of time over a period of a month getting, using, or getting over the effects of the substance, (2) Unable to keep set limits on substance use or used more often than intended, (3) Needed to use the substance more than before to get desired effects or noticed that using the same amount had less effect than before, (4) Unable to cut down or stop using the substance every time he or she tried or wanted to, (5) Continued to use the substance even though it was causing problems with emotions, nerves, mental health, or physical problems, (6) Reduced or gave

up participation in important activities due to substance use. This measure has demonstrated superb reliability and validity in multiple studies and racially/ethnically diverse samples [65–67].

Past-Year Serious Psychological Distress (SPD)—Past-year SPD was assessed by survey respondent scores on the Kessler Psychological Distress Scale (K6)[84], which is a sixitem measure of nonspecific psychological distress and includes items that assess symptoms such as feeling hopeless, restless, fidgety, worthless, depressed, and that everything was an effort. For every question, a value of zero, one, two, three, or four was assigned to the corresponding responses of “none of the time,” “a little of the time,” “some of the time,” “most of the time,” or “all of the time,” respectively. To screen positive for past-year SPD, survey respondents had to have a K6 score of 13 or greater (range 0–24) [85]. This measure is reliable and has been validated in diverse populations throughout the world as well as in military samples [86–89].

Race/ethnicity—The NSDUH has seven race/ethnic categories based on participant self-report: non-Hispanic White, non-Hispanic Black, American Indian/Alaska Native (AI/AN), Native Hawaiian or other Pacific Islander, Asian, more than one race, and Hispanic. These categories were defined by investigators based on the US Office of Management and Budget’s Revisions to the Standards for Classification of Federal Data on Race and Ethnicity. For the purposes of this study, Native Hawaiian and Pacific Islander veterans were excluded from the sample due to small cell sizes.

Covariates—We measured sociodemographic characteristics as covariates for our regression models, including sex (male, female), NSDUH age category (18, 19, 20, 21, 22 or 23, 24 or 25, 26–29, 30–34,35–49 and 50–64 years), residence locality type (large metro, small, and nonmetro), household income category (< $20,000, $20,000–$49,999, $50,000–$74,999, and $75,000 or more), and health insurance coverage (yes/no).

Statistical Analyses

All statistical analyses were conducted using the NSDUH sampling weights and controlling for complex clustered sampling using Stata version 16.1 software [90]. We conducted descriptive analyses to characterize the sample. Logistic regression models were used to examine the effect of race/ethnicity on each of the following dichotomous outcomes separately: past-year alcohol dependence, past-month nicotine dependence, past-year illicit drug dependence, and past-year SPD. Adjusted models controlled for sex, age category, residence locality type, household income category, and health insurance coverage. Benjamini–Hochberg corrections were used to account for multiple comparisons [91, 92].

Results

Descriptive Results

The sample (N = 7653) was predominantly male (82%) and non-Hispanic White (69%). Our NSDUH sample had a sizeable number of non-Hispanic Black (14%), AI/AN (2%), Asian (1%), more than one race (5%), and Hispanic veterans (9%). Additional demographic

characteristics of our sample are presented in Table 1. Additionally, 5% of participants met the criteria for past-year alcohol dependence, 18% met the criteria for past-month nicotine dependence, 2% met the criteria for past-year illicit drug dependence, and 15% met the criteria for past-year SPD (Table 1). The median age category for all the racial/ethnic groups was between 35 and 49 years old. All racial/ethnic groups had a majority of male veterans. Although the sample had exceptionally high rates of insurance coverage (92%), there were some statistically significant differences by race/ethnicity. AI/AN veterans were significantly more likely to have health insurance than non-Hispanic White veterans ($p < 0.05$), whereas veterans of more than one race were significantly less likely to have health insurance than non-Hispanic White veterans ($p < 0.05$). Asian American veterans reported the highest annual median household income ($75,000 or more) and more than one race veterans reported the lowest ($20,000–$49,000). All other racial/ethnic groups reported $50,000–$74,999 as their annual median household income. Non-Hispanic White veterans were significantly more likely to live in small metros, whereas Non-Hispanic Black, Asian American, and Hispanic American veterans were significantly more likely to live in large metros ($p < 0.001$). AI/AN veterans were significantly more likely to live in nonmetro areas relative to non-Hispanic White veterans ($p < 0.01$). More than one race veterans did not significantly differ in their likelihood of living in small metros when compared to non-Hispanic White veterans.

Race/Ethnicity and Past-Year Alcohol Dependence

In our adjusted model we observed that AI/AN veterans reported significantly higher odds of past-year alcohol dependence (AOR = 2.55, 95% CI: 1.28, 5.08; $p < 0.05$) and Asian veterans reported significantly lower odds of past-year alcohol dependence relative to non-Hispanic White veterans (AOR = 0.12, 95% CI: 0.02, 0.62; $p < 0.05$). These results mirror the unadjusted model.

Race/Ethnicity and Past-Month Nicotine Dependence

In our adjusted model we observed significantly lower past-month nicotine dependence in non-Hispanic Black (AOR = 0.60, 95% CI: 0.48, 0.77; $p < 0.001$), Hispanic (AOR = 0.47, 95% CI: 0.34, 0.65; $p < 0.001$), and veterans of more than one race (AOR = 0.55, 95% CI: 0.36, 0.83; $p < 0.01$) relative to non-Hispanic White veterans. These results mirror the unadjusted model.

Race/Ethnicity and Past-Year Illicit Drug Dependence

In our adjusted model we observed that Asian veterans (AOR = 0.05, 95% CI: 0.01, 0.35; $p < 0.05$) reported significantly lower odds of past-year illicit drug dependence relative to non-Hispanic White veterans.

Race/Ethnicity and Past-Year Serious Psychological Distress

In our unadjusted model, no significant differences were observed. However, in our adjusted model we observed that non-Hispanic Black veterans (AOR = 0.69, 95% CI: 0.55,0.85; $p < 0.01$) reported significantly lower odds of past-year SPD relative to non-Hispanic White veterans.

Discussion

The current study examined the association of racial/ethnic groups with SUDs and SPDs among veterans using a large nationally representative sample. Our results suggest some veteran subpopulations experience disparities in SUDs and SPD. We observed that AI/AN veterans had significantly greater odds of past-year alcohol dependence relative to non-Hispanic White veterans, whereas Asian veterans had significantly lower odds of past-year alcohol dependence relative to non-Hispanic White veterans. Regarding past-month nicotine dependence, non-Hispanic Black, Hispanic American, and veterans of more than one race reported significantly lower odds relative to non-Hispanic White veterans. Additionally, Asian American veterans had significantly lower odds of past-year illicit drug dependence relative to non-Hispanic White veterans. Non-Hispanic Black veterans had significantly lower odds of past-year SPD relative to non-Hispanic White veterans. These findings underscore some of the potential protective factors of veteran status for minoritized groups (e.g., greater access to healthcare, and higher socioeconomic status relative to their minoritized civilian counterparts) given that some disparities in civilian populations were not present in this sample (Table 2) [93].

We observed notable locality differences among veterans, which were controlled for in adjusted regression models. Non-Hispanic Black, Asian American, and Hispanic veterans were more likely to live in large metro areas when compared to non-Hispanic White veterans who tended to live in smaller metro areas (i.e., suburbs), whereas AI/AN veterans were more likely to live in nonmetro (i.e., rural) areas. These locality differences are consistent with those observed in civilian populations in which non-Hispanic Black, Hispanic, and some AI/AN veterans largely reside in urban areas, whereas other AI/AN groups reside in sovereign tribal nations, often located in more rural communities (i.e., nonmetro areas). These sociodemographic differences are important given that racial residential segregation/neighborhood disadvantage can play a significant role in an individual's access to mental health/SUD treatment and the tobacco/alcohol retail density in communities [94–98]. The issue is even more complicated for AI/AN populations since they may also experience significant barriers to healthcare access while living on reservations due to the perpetual underfunding of the Indian Healthcare Service [23] and less healthcare access in economically depressed urban areas. In stark contrast to prior research, AI/AN veterans reported higher rates of insurance coverage than non-Hispanic White veterans [19, 20]. The following factors may explain this finding: (1) greater efforts devoted to increasing AI/AN veteran insurance rates, (2) the mischaracterization of the Indian Healthcare Service as a form of insurance, and (3) an undercounting of AI/AN veteran insurance rates due to many AI/AN veterans being included in the more than one race category due to high numbers of individuals with multiracial identities (e.g., White/AI/AN or Black/AI/AN) [99].

Implications

To our knowledge, this is the first study examining racial/ethnic disparities in SUDs and SPDs in veteran subpopulations other than Black, Hispanic, and non-Hispanic White. Notably, Asian American veterans reported lower odds of past-year alcohol and illicit drug dependence relative to non-Hispanic White veterans. Some prior research suggests that

acculturation may be a risk factor in Asian American civilian substance and alcohol use [100, 101]. While there is a paucity of literature on AI/AN veteran health disparities in SUDs, our results of AI/AN veterans being at most risk for past-year alcohol dependence may be explained by previous work which noted that AI/AN veterans experience significant challenges in healthcare access and coverage compared to non-Hispanic White veterans [19]. It may also be attributable to other factors such as discrimination, Indian boarding schools, and generational/historical trauma [12, 13, 102–104]. The implication of this finding is that AI/AN veterans may benefit from culturally tailored interventions targeting alcohol dependence. Additionally, it can guide future research to uncover additional psychosocial differences in disparities that make AI/AN veterans more prone to alcohol use dependence relative to other US veteran subpopulations.

Although the alcohol dependence disparity for AI/AN veterans is consistent with findings in the civilian population, the lack of disparities in nicotine dependence, illicit drug dependence, and SPD relative to White veterans is notable [105–110]. Similar to the civilian AI/AN population, this finding may be related to factors such as historical trauma and racial discrimination in conjunction with a higher rate of combat exposure [24, 59, 111, 112]. These findings starkly differ from the significant disparities in substance-related deaths and smoking prevalence in AI/AN civilians relative to White American civilians [107, 113]. This may be attributable to some underlying protective factors of veteran status. Also, our findings are consistent with active-duty soldier studies that have noted that Black veterans are less likely to smoke cigarettes than White veterans [42, 43, 114, 115]. These findings may be partly driven by less stark differences in socioeconomic status and healthcare access for minoritized veterans when compared to non-Hispanic White veterans as noted in VA minoritized veteran reports [93, 116]. These differences, however, may not be fully attributable to increase coverage given the ongoing institutional racism and cultural competency issues in the VA healthcare system [16, 18]. Moreover, these findings highlight the importance of studying the racial/ethnic status of veterans to better understand protective factors against SUDs that differ from civilian populations. Future research can also evaluate the role of veteran military identity in impacting SUDs disparities or similarities among non-Hispanic White and racial/ethnic minoritized veterans. Additionally, future research should examine SUD and SPD differences among racial/ethnic minoritized veterans longitudinally to better understand how these outcomes occur over time.

While literature concerning racial/ethnic disparities in SPDs among military veteran populations is scant, multiple studies have highlighted mental health disparities in minoritized veterans [17, 117]. Some VA-based research suggests minoritized veterans experience more mental health conditions compared to non-Hispanic White veterans [43], whereas other VA studies have noted that Hispanic and non-Hispanic White veterans are at greater risk of SPD relative to Black veterans. Additionally, the civilian literature on SPD suggests that Black and Hispanic people experience greater past 30-day SPD than non-Hispanic White people, irrespective of age group [118]. However, some studies have noted significantly lower rates of SPD in Black civilian populations as a function of religiosity and social support [119–121]. Among older adults, some civilian research found Black, Hispanic, and AI/AN adults were significantly more likely to report past-year psychological distress relative to non-Hispanic White Americans with AI/AN adults having the highest

prevalence [122]. Notably, Asian American adults reported the lowest prevalence of past-year SPD in that study [122]. Additionally, research on AI/AN civilians has noted a higher prevalence of psychiatric disorders relative to non-Hispanic White civilians [12, 123–125]. Notably, our study yielded results that are dissimilar to the aforementioned studies. Rather, we observed that Black veterans reported significantly lower past-year SPD relative to non-Hispanic White veterans, which may be driven by differences in religiosity and social support between these populations [126]. We also did not find any significant differences in past year SPD between AI/AN and Asian American veterans relative to non-Hispanic White veterans, which contrasts with prior research [24, 55].

The observed differences to prior civilian and veteran studies may also be attributable to the following factors: (1) the sample included VA and non-VA veterans, (2) our sample was far more diverse than prior studies (i.e., the inclusion of AI/AN, Asian American, and multiracial veterans), (3) racial/ethnic veterans in this sample may have greater access to healthcare than their civilian counterparts, (4) and some active-duty literature suggests that non-Hispanic White soldiers are more likely to have combat exposure irrespective of military branch served than other minoritized soldiers [115]. Overall, the implications of our results regarding SPD and racial/ethnic minoritized veterans can underscore the aforementioned protective factors and additional discrepancies present in the sample. Regarding SUDs, culturally tailored interventions may be warranted for disproportionately impacted populations such as AI/AN veterans given that similar alcohol dependence disparities are observed in the AI/AN civilian population [105, 108]. For instance, VA hospitals and other military healthcare providers should explore incorporating traditional healing practices in tandem with Western medicine approaches in AI/AN veteran treatment plans if it is requested by the patients [22, 112, 127].

Limitations

These study findings are not without limitations. As a secondary data analysis, we were unable to examine military-specific variables that might affect SPD and SUDs, including combat exposure since the variable is not present in NSDUH datasets. Greater combat exposure is associated with a higher likelihood of experiencing SPD and SUDs [128]. Although previous studies suggest that non-Hispanic White veterans experience greater combat exposure than minoritized veterans, we were not able to substantiate that in the present study [115], but this could be addressed in future work. In addition to combat exposure, variables listing officer rank, as well as military branch served, would be important to examine to further contextualize the relationships between race/ethnicity and SPD and SUDs among veterans. Some research suggests that certain minoritized groups may gravitate more towards non-combat roles to gain skills from the military that can lead to employment in the civilian workforce [16].

Findings are also limited by the NSDUH's aggregation of the Asian American and Hispanic race/ethnicity categories. Prior studies have found significant differences in the prevalence of alcohol-related problems among the various Hispanic and Latinx subgroups which underscores the importance of considering them separately [129]. These health disparities may also exist among Asian American subgroups [130]. Similar differences have been

observed when disaggregating the AI/AN broad category by regional tribes [131]. Moreover, this study did not examine differences by sex as our sample was predominantly male (82%). Additionally, the NSDUH's aggregation of the More than one race category may be contributing to an undercounting of multiracial AI/AN individuals, who represent one of the largest multiracial groups in the United States [99].

Another limitation is the small number of AI/AN, and Asian American veterans in the sample but it must be noted that these numbers are greater than many studies that have included these populations. Additionally, the NSDUH does not collect data on people who are incarcerated, in nursing homes, hospitalized, or homeless individuals who are not in shelters which may constitute a sizeable portion of the veteran population. It also must be noted that some veterans may have been excluded from the NSDUH survey due to internet-connectivity issues (e.g., underserved rural localities or income barriers to internet access), which may partly explain the survey response rates. Lastly, the cross-sectional nature of the study only provides a snapshot of racial/ethnic differences in SUDs and SPD. Future studies should employ longitudinal designs to establish stronger causal inferences about the relationships between these variables of interest. Additionally, future studies should examine the effect of religiosity and social support on SUDs and SPD in US veterans.

Conclusion

Despite these limitations, the current study highlights health disparities among minoritized veterans that vary from those experienced by their civilian counterparts, using a large nationally representative sample. This cross-sectional work is a preliminary step toward developing longitudinal studies that address various factors that contribute to these observed disparities (e.g., treatment barriers, neighborhood disadvantage, and income inequalities). Longitudinal studies are needed to determine if culturally tailored interventions must be employed for certain veteran subgroups. Future research could further be tailored towards examining temporal relationships between race and ethnicity, SUDs and SPD, insurance coverage, socioeconomic status, and household income among veterans to reveal differences and nuances based on additional factors. Lastly, future studies should prioritize addressing disparities in military service personnel to prevent them from persisting or heightening in their transition to veteran status.

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Data availability

All data generated or analyzed during this study are included in this published article and the Open Science Framework.

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Table 1

Study Sample Characteristics: National Survey on Drug Use and Health, (2015–2019; N = 7,653)

	Non-Hispanic White %(*n*) (*n* = 5256)	**Non-Hispanic Black %(*n*) (*n* = 1087)**	**AI/AN %(*n*) (*n* = 115)**	**Asian American %(*n*) (*n* = 109)**	**More than once race %(*n*) (*n* = 363)**	**Hispanic %(*n*) (*n* = 723)**
Sex						
Male	84% (4401)	78% (844)	85% (98)	82% (89)	80% (289)	76% (552)
Female	16% (855)	22% (243)	15% (17)	18% (20)	20% (74)	24% (171)
Median Age Category	35–49 years old	35–49 years old	35–49 years old	35–49 years old	35–49 years old	35–49 years old
Median Family Income	$50,000–$74,999	$50,000–$74,999	$20,000–$49,999	$75,000 or more	$20,000–$49,999	$50,000–$74,999
Locality						
Large Metro	33% (1725)	53% (580)	13% (15)	56% (61)	40% (146)	47% (342)
Small Metro	42% (2209)	35% (381)	35% (40)	38% (41)	41% (149)	40% (292)
Nonmetro	25% (1322)	52% (60)	52% (60)	6% (7)	19% (68)	12% (89)
Insurance						
Yes	93% (4865)	93% (1007)	97% (112)	96% (105)	89% (324)	92% (663)
No	7% (391)	7% (80)	3% (3)	4% (4)	11% (39)	8% (60)
Past-Year Alcohol Dependence						
Yes	5% (242)	5% (51)	12% (14)	2% (2)	5% (17)	5% (39)
No	95% (5014)	95% (1036)	88% (101)	98% (107)	95% (346)	95% (684)
Past-Month Nicotine Dependence						
Yes	20% (1027)	16% (170)	19% (22)	10% (11)	20% (74)	11% (82)
No	80% (4229)	84% (917)	81% (93)	90% (98)	80% (289)	89% (641)
Past-Year Illicit Drug Dependence						
Yes	3% (132)	3% (29)	3% (3)	1% (1)	8% (2)	2% (14)
No	97% (5124)	97% (1058)	97% (112)	99% (108)	98% (355)	98% (709)
Past-Year Serious Psychological Distress						
Yes	15% (766)	13% (141)	14% (16)	18% (20)	16% (58)	16% (113)
No	85% (4490)	87% (946)	86% (99)	82% (89)	84% (305)	84% (610)

Table 2

Adjusted[a] Odds of Substance Dependence and Serious Psychological Distress Among Veterans by Race/Ethnicity (N = 7,653)

	Past-Year Alcohol Dependence AOR (95% CI)	Past-Month Nicotine Dependence AOR (95% CI)	Past-Year Illicit Drug Dependence AOR (95% CI)	Past-Year Serious Psychological Distress AOR (95% CI)
Race/Ethnicity				
Non-Hispanic White	Referent	Referent	Referent	Referent
Non-Hispanic Black	1.15 (0.73, 1.81)	0.60 *** (0.48, 0.77)	0.94 (0.44, 2.00)	0.69 ** (0.55, 0.85)
AI/AN	2.55 ** (1.28, 5.08)	0.56 (0.21, 1.52)	0.61 (0.16, 2.28)	1.12 (0.44, 2.86)
Asian American	0.12 * (0.02, 0.62)	0.52 (0.14, 1.91)	0.05 * (0.01, 0.35)	0.73 (0.38, 1.39)
More than one race	0.92 (0.33, 2.54)	0.55 ** (0.36, 0.83)	0.46 (0.18, 1.17)	0.82 (0.45, 1.48)
Hispanic	1.41 (0.81, 2.45)	0.47 *** (0.34, 0.65)	0.50 (0.25, 0.99)	0.75 (0.57, 0.97)
Sex				
Male	Referent	Referent	Referent	Referent
Female	0.85 (0.54, 1.34)	0.78 * (0.62, 0.99)	0.83 (0.45, 1.50)	2.04 *** (1.57, 2.66)
Age	0.88 * (0.79, 0.98)	1.05 (0.99, 1.10)	0.85 * (0.74, 0.96)	0.78 *** (0.74, 0.82)
Income				
< $20,000	Referent	Referent	Referent	Referent
$20,000–$49,999	0.35 *** (0.21, 0.57)	0.58 *** (0.46, 0.73)	0.36 ** (0.20, 0.67)	0.64 ** (0.46, 0.88)
$50,000–$74,999	0.38 *** (0.24, 0.62)	0.39 *** (0.31, 0.50)	0.43 ** (0.25, 0.76)	0.43 *** (0.30, 0.62)
$75,000- or more	0.32 *** (0.21, 0.50)	0.19 *** (0.15, 0.26)	0.25 *** (0.14, 0.44)	0.27 *** (0.20, 0.37)
Locality				
Large Metro	Referent	Referent	Referent	Referent
Small Metro	1.00 (0.71, 1.39)	1.06 (0.87, 1.29)	0.82 (0.53, 1.26)	0.95 (0.76, 1.18)
Nonmetro	0.68 (0.42, 1.10)	1.32 * (1.05, 1.67)	0.68 (0.35, 1.32)	0.86 (0.69, 1.08)
Insurance				
Yes	Referent	Referent	Referent	Referent
No	1.34 (0.79, 2.28)	2.17 *** (1.64, 2.86)	2.98 *** (1.73, 5.14)	0.87 (0.64, 1.18)

* $p < .05$;

** $p < .01$;

***$p < .001$ significant after Benjamini–Hochberg correction

covariates were not examined for each racial/ethnic group individually due to cell size limitations

AOR > 1.00 = the case group has higher odds of the outcome than the referent group, controlling for the other covariates in the model

AOR < 1.00 = the case group has lower odds of the outcome than the referent group, controlling for the other covariates in the model