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Pregnancy and Binge Drinking: An Intersectionality Theory Perspective Using Veteran Status and Racial/Ethnic Identity

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Abstract

Objectives Alcohol use during pregnancy is a critical public health issue that results in several adverse outcomes for both mother and child. While the prevalence of and consequences of binge drinking among pregnant women is well-documented in the literature, little is known about the intersectional effect of racial/ethnic identity and veteran status. The purpose of this study was to examine the prevalence of binge drinking among pregnant women using the intersectionality of racial/ethnic identity and veteran status.

Methods This study utilized combined data from the 2016, 2017 and 2018 Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is a telephone survey that collects health-related risk behaviors, chronic health conditions and use of preventative services among U.S residents. Generalized linear mixed models were used to examine the prevalence of binge drinking using the interaction between race/ethnicity and veteran status.

Results Overall binge drinking prevalence was 3.60% among the sample of 6101 pregnant women. Binge drinking prevalence was the highest among racial/ethnic minority veterans at 17.42%, compared to 5.34% among white veterans, 4.05% among non-veteran racial/ethnic minorities and 3% among non-veteran whites, supporting the theory of intersectionality.

Conclusions Intersectionality Theory suggests that the stressors from membership in two vulnerable groups may lead to increased disparities. The results of this study highlight the unique experience of being a veteran and identifying as a member of a racial/ethnic minority group. This calls for a need to customize preventative measures that address the combined impact of both racial/ethnic minority group status and veteran status.

Keywords Binge-drinking · Pregnancy · Racial/ethnic minority · Veteran · Race · Alcohol

Significance Statement

What is Already Known About the Subject? Binge drinking during pregnancy has been found to cause several adverse effects for both the mother and the fetus. Racial/ethnic minorities experience multiple stressors related to racial status, which results in alcohol dependency both before and during pregnancy.

What does this Study Add? This study examined the impact of both racial/ethnic minority status and veteran status, using the theory of intersectionality. Results show that racial/ethnic minorities who are also veterans have a higher prevalence of binge drinking during pregnancy compared to white veterans, racial minority non-veterans and white non-veterans, likely due to compounding stressors from both identities.

Introduction

Alcohol use during pregnancy is a critical public health issue that results in a number of adverse outcomes for both mother and child. Globally, it is estimated that about 9.8% of women consume alcohol during pregnancy (Popova et al., 2018) and in the United States, 1 in 9 pregnant women report drinking alcohol in the past 30 days (Denny et al., 2019). Among

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those who reported consuming alcohol during pregnancy, one third also reported binge drinking with an average of 4.5 binge-drinking episodes within a 30-day period (Denny et al., 2019). These prevalence rates depict an increasingly dire picture for birth outcomes as alcohol has been identified as a teratogen; an exogenous factor that results in the malformation of a fetus (Ornoy & Ergaz, 2010).

Alcohol exposure in utero has been found to affect fetal brain development, leading to a range of physical and neurobehavioral defects known as fetal alcohol spectrum disorders (FASD) (Mattson et al., 2019). In addition to the risk of FASD, alcohol use during pregnancy can also result in stillbirth (intrapartum fetal demise; Bailey & Sokol, 2011), miscarriage (Bailey & Sokol, 2011), preterm birth (born before 37 weeks completed gestation; Patra et al., 2011; Bailey & Sokol, 2011), spontaneous abortion (Sundermann et al., 2020), low birth weight (less than 5.5 lb or 2500 g; Patra et al., 2011) and sudden unexpected infant death syndrome (Bailey & Sokol, 2011; O'Leary et al., 2013).

Considering the severity of these adverse outcomes, it is important to address how existing inequities under normal circumstances can be a primer for alcohol dependency during pregnancy. Racial/ethnic minorities are disproportionately represented in the homeless population and have more difficulty procuring housing compared to whites (Rutan & Glass, 2018). Racial/ethnic minorities also have a higher prevalence of the major chronic illnesses, which account for 7 in 10 deaths in the United States (Price et al., 2013). Contributing to these health inequities are the great economic disparities that exist between racial/ethnic minorities and whites; racial/ethnic minorities have notably lower educational attainment, lower rates of home ownership and have nearly twice the proportion of households below the poverty line as compared to whites (Cunnigham et al., 2017).

For racial/ethnic minorities who are also military veterans, these existing physical and economic inequities are further exacerbated by their veteran status (Morin, 2011). Depending on the roles undertaken in the military, racial/ethnic minority veterans may experience a number of stressors long after exiting service including pain from sustained injuries, post-traumatic stress disorder (PTSD), depression, anxiety, suicidality, substance use and other mental and physical health conditions (McKinney et al., 2017; Teeters et al., 2017; Knowles et al., 2019).

The theory of intersectionality suggests that a person's membership in multiple vulnerable groups combine to create unique experiences of discrimination and hardships (Crenshaw, 1989). The combined hardships from both racial/ethnic inequities and stressors from being a veteran could therefore culminate in a greater risk of developing unhealthy coping mechanisms that may include binge drinking. According to the theory of intersectionality (Crenshaw, 1989), examining binge drinking by veteran status alone or racial status alone would not provide insight into the specific groups that are most at-risk. As such, the purpose of this study is to examine the combined effect of both intersectional identities on the prevalence of binge drinking during pregnancy.

We hypothesize that veterans who are racial/ethnic minorities will have a higher likelihood of binge drinking during pregnancy as a result of their memberships in two vulnerable groups.

Methods

Data Collection and Sample

In this cross-sectional study, we obtained and merged data from the 2016, 2017, and 2018 Behavioral Risk Factor Surveillance System (BRFSS) surveys (CDC, 2019a). The Centers for Disease Control and Prevention's BRFSS is an annual survey of 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 response rates of 46%, 45%, and 43% (CDC, 2019b, c, d). 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 density is determined by the number of listed households in an area code. A simple random sampling design was used to gather data via cellular telephone (CDC, 2019e).

Individuals included in this study were survey respondents who answered in the affirmative to the following question, which was designed to assess a current pregnancy: "To your knowledge, are you now pregnant?" Data from a total of 2403 participants, 2576 participants, and 2516 participants were collected in the 2016, 2017, and 2018 BRFSS surveys, respectively. Because of missing data on the measures described below (18.60% of the initial dataset), the final merged analytic sample includes 6101 pregnant females. This study was deemed exempt from Institutional Review Board review by the lead author's institution.

Measures

Numerous studies have documented the validity and reliability of questions asked in the BRFSS survey (CDC, 2019f). We obtained sociodemographic measures for each participant, including age (continuous, but truncated at age 80 years), race/ethnicity (reported as white non-Hispanic, Black non-Hispanic, American Indian or Alaskan Native non-Hispanic, Asian non-Hispanic, Native Hawaiian or

other Pacific Islander non-Hispanic, multiracial non-Hispanic, Hispanic, or other non-Hispanic and further categorized as white and racial/ethnic minority for the analysis), annual income (< $25,000 or ≥ $25,000), and state of residence. Veteran status was determined 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 with the following question: "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?" Response options for this question were grouped into three categories, as in McDaniel et al. (2020): (a) 0 days, (b) 1–13 days, and (c) 14 or more days.

One "current cigarette use" variable was created by combining responses from two survey questions: have you smoked at least 100 cigarettes in your entire life; and do you now smoke cigarettes every day, some days, or not at all? Based on responses to these two questions, we coded survey respondents into two categories: not currently smoking cigarettes and current smoker.

Binge consumption of alcohol was determined using one BRFSS calculated variable based on the following question: "Considering all types of alcohol beverages, how many times during the past 30 days did you have 5 (for men) or 4 (for women) or more drinks on an occasion?" Individuals who reported any binge drinking in the past 30 days were coded as binge drinkers while all other respondents were coded as not engaging in any binge drinking.

Data Analysis

All data analyses were conducted in R Studio version 3.6.1. We used the BRFSS complex survey design weights, the methodology for which is described elsewhere (CDC, 2019g), in all analyses. In order to test our hypothesis, we estimated 2 generalized linear mixed models with a logit link. The dependent variable in both models was 'past month binge drinking' (0 = no, 1 = yes). A random intercept was included in each model for respondents' state of residence. Fixed covariates in model 1 included age, race/ethnicity, annual income, mental distress, cigarette use, and veteran status. Fixed covariates in model 2 include age, race/ethnicity, annual income, mental distress, cigarette use, veteran status, and an interaction term for veteran status and race. The interaction in model 2 allowed us to test our hypothesis—that is, whether veteran and racial/ethnic minority status increased a pregnant female's risk of engaging in binge drinking.

Table 1 Sociodemographic characteristics and overall prevalence of binge drinking in the study sample of pregnant women by race/ethnicity and veteran status, 2016–2018

	Veteran		Nonveteran	
	White (n = 68)	Racial/ethnic minority (n = 77)	White (n = 3763)	Racial/ethnic minority (n = 2193)
Variable	% (SE)	% (SE)	% (SE)	% (SE)
Annual income ≥ $25,000	84.38 (4.75)	69.74 (6.91)	78.80 (0.82)	47.64 (1.28)
Monthly days of mental distress				
0	65.93 (6.30)	48.94 (7.22)	59.24 (0.93)	65.03 (1.25)
1–13	18.17 (4.90)	27.67 (6.33)	30.11 (0.86)	23.02 (1.09)
14 +	15.90 (4.66)	23.39 (6.63)	10.65 (0.60)	11.95 (0.88)
Current cigarette use				
No	88.27 (4.22)	81.92 (5.78)	90.11 (0.64)	92.08 (0.82)
Yes	11.73 (4.22)	18.08 (5.78)	9.89 (0.64)	7.92 (0.82)
Past month binge drinking				
No	94.66 (2.78)	82.58 (5.71)	97.00 (0.32)	95.95 (0.64)
Yes	5.34 (2.78)	17.42 (5.71)	3.00 (0.32)	4.05 (0.64)
Variable	M (SE)	M (SE)	M (SE)	M (SE)
Age	30.86 (0.80)	29.16 (1.29)	29.43 (0.12)	28.47 (0.16)

Results

Sample characteristics are shown in Table 1. The racial/ethnic composition of pregnant females in this study was primarily white (62.61%). The average age of those who reported a current pregnancy was 29.10 years (SE = 0.10). Additionally, the sample was composed of 145 (2.48%) military veterans. A larger share of individuals (67.25%) reported an annual income of at least $25,000 than an income of less than $25,000. Of the pregnant females in this study, 653 (11.36%) reported 14 or more days of mental distress in the past month and 467 (9.32%) were current users of cigarettes. Binge drinking prevalence in the sample was 3.60% (95% CI 3.03, 4.28).

In Fig. 1, we provide survey-weighted estimates of binge drinking for the sub-samples in the significant interaction term from model 2. Standard error bars are provided in the figure to permit an understanding of the standard deviation of the sampling parameter. The results of our analysis showed that the prevalence of binge drinking in racial/ethnic minority veterans (17.42%) was much higher than for other combinations of categories in the veteran status and race/ethnicity variables. Binge drinking prevalence among pregnant white veterans was 5.34%, followed by racial/ethnic minority non-veterans (4.05%) and white non-veterans (3.00%).

Results of the generalized linear mixed logistic regression models are shown in Table 2. The results of model 1 showed that younger age, white race, lower annual income, increasing days of mental distress, current cigarette use, and veteran status was associated with increased risk for binge drinking among pregnant females. Importantly, however, the results of model 2 showed that an interaction term for veteran status and race/ethnicity was statistically significant (aOR = 1.92, 95% CI 1.01, 3.65, p = 0.048). Pregnant racial/ethnic minority veterans had a binge drinking rate that was 12.08 percentage points higher than pregnant white veterans; while pregnant racial/ethnic minority non-veterans had a binge drinking rate that was 1.05 percentage points higher than pregnant white non-veterans.

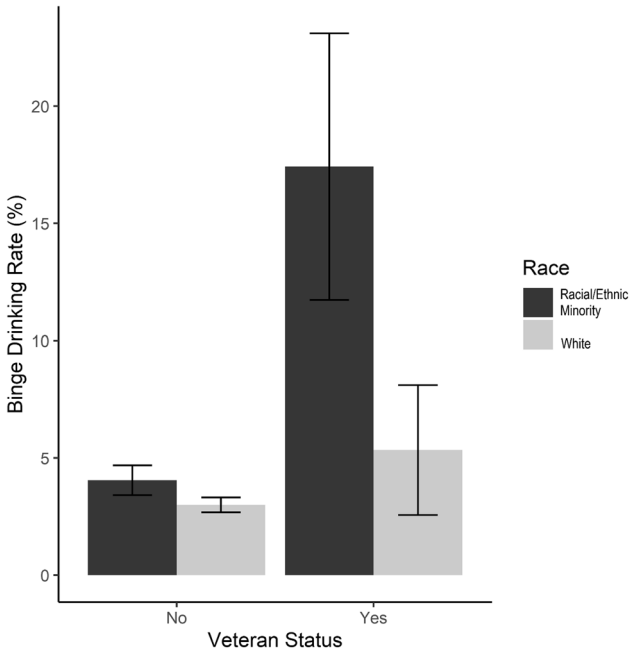

Fig. 1 Prevalence of binge drinking among pregnant women by veteran status and race/ethnicity, 2016–2018

Table 2 Results of a generalized linear mixed model showing the relationship between veteran status, race, and binge drinking during pregnancy

Variable	Model 1 aOR[a] (95% CI)	Model 2 aOR[a] (95% CI)
Intercept	0.01 (0.003, 0.01)*	0.01 (0.004, 0.01)*
Age	0.96 (0.95, 0.97)*	0.96 (0.95, 0.98)*
Race (Racial/Ethnic minority)	1.96 (1.69, 2.27)*	1.89 (1.62, 2.19)*
Annual income ≥ $25,000	2.87 (2.42, 3.41)*	2.85 (2.40, 3.39)*
Monthly days of mental distress		
0	Reference	Reference
1–13	2.52 (2.15, 2.96)*	2.51 (2.15, 2.94)*
14+	3.38 (2.80, 4.07)*	3.37 (2.80, 4.07)*
Current use of cigarettes	5.66 (4.79, 6.70)*	5.63 (4.76, 6.66)*
Veteran	2.80 (2.11, 3.71)*	0.93 (0.30, 2.95)
Veteran × Race/Ethnicity		1.92 (1.01, 3.65)*
Random intercept variance (State-Level)	0.55	0.56

[a]Adjusted odds ratio

*P value for odds ratio < 0.05

Discussion

The purpose of this study was to determine the effect of the intersectionality of racial/ethnic identity and veteran status on the prevalence of binge drinking among pregnant women. Among the 6101 pregnant women included in the study, the binge-drinking prevalence was 3.60% which closely mirrors the 3.9% prevalence rate found in a similar study utilizing data from the 2015–2017 BRFSS (Denny et al., 2019).

For the interaction between racial/ethnic identity and veteran status, the prevalence rate of binge drinking between the four groups was highest for racial/ethnic minority veterans at 17.42%, compared to 5.34% among white veterans, 4.05% among non-veteran racial/ethnic minorities, and 3% among non-veteran whites. These results support the theory of intersectionality in that pregnant racial/ethnic minority veterans (i.e., individuals with more than one marginalized identity) had the highest binge drinking rates. These results also mirror previous studies examining the intersectionality of racial/ethnic identity and veteran status, with racial/ethnic minority veterans having the greatest disparities (Kutney-Lee et al., 2017; Carter et al., 2020). The binge drinking rate among White veterans was also significantly higher than that of White non-veterans, which mirror prior studies that show a high level of stressors among veterans in general, including post-traumatic stress disorder, depression, suicidality, substance misuse and other adverse psychosocial outcomes (Morin, 2011; McKinney et al., 2017; Teeters et al., 2017; Knowles et al., 2019).

Being a veteran and identifying as a racial/ethnic minority group member each present unique challenges. The effects of active duty in the military, for example, can have long-term consequences long after reintegration into the civilian life (Morin, 2011). Veterans may have injuries sustained from the military resulting in chronic pain and recollections of traumatic events leading to post-traumatic stress disorder (Lew et al., 2009). These stressors may also lead to other conditions including substance abuse, suicidality, depression, anxiety, and other psychological ailments (McKinney et al., 2017; Teeters et al., 2017; Knowles et al., 2019). These mental health concerns can consequently influence macro-level challenges like interactions with the justice system, the health care system, and homelessness (Elbogen et al., 2012; Tsai et al., 2016).

Racial/ethnic minorities in the United States have a number of challenges resulting from historical, systemic, and cultural factors. The effects of systemic racism remain prevalent today with policies like redlining affecting the procurement of housing among racial/ethnic minorities and influencing health inequities (Rutan & Glass, 2018). Racial/ethnic minority are more likely to have chronic illnesses, mental health concerns, substance use, and have a higher mortality compared to whites (Price et al., 2013; Cunningham et al., 2017; Evans et al., 2017). These individuals' stressors from two identities combine to create a detrimental risk for racial/ethnic minority veterans, which may be further exacerbated by the difficulties of pregnancy, resulting in a higher need for favored coping mechanisms. Racial/ethnic minority veterans who may have been light drinkers before pregnancy, for example, may start binge-drinking as the additional stressor of pregnancy combines with the complexities of living as a racial/ethnic minority veteran. With evidence showing that racial/ethnic minority women are less likely to cease binge drinking during pregnancy (Tenkku et al., 2009), it is important to consider preventative measures to treat binge drinking before and during pregnancy.

With several barriers to treatment access including lack of economic capital and fear of prosecution, it is important to not only make treatment available but to ensure that it is affordable and accessible without consequence of incarceration or potential loss of child custody. In the United States, only ten states explicitly prevent publicly funded substance use treatment programs from discriminating against pregnant women (Guttmacher Institute, 2020), which means a large majority of pregnant women in the U.S can be turned away from accessing treatment. Furthermore, 25 states and the District of Columbia require medical professionals to report suspected prenatal substance use (Guttmacher Institute, 2020) which may not only deter pregnant women from seeking treatment for binge-drinking but may also prevent these women from getting antenatal care, thereby increasing the likelihood of adverse birth outcomes.

These results have significant transferability to practice, policy, and research initiatives. The significant disparities noted between racial/ethnic minority veterans and non-veteran whites indicate that the stressors of membership in two at-risk groups (i.e., veteran and racial/ethnic minority) results in a higher risk of binge-drinking during pregnancy, leading to deleterious effects for both mother and child (WHO, 2016). The severity of this disparity and the intensity of alcohol addiction points to a need for preventative measures that can be implemented before pregnancy as prevention is the most effective solution (McBridet et al., 2012).

One possible intervention is to implement alcohol screening for female veterans during regular health checks in order to identify alcohol use early. This service can be offered through the department of veteran's affairs (VA) women's health clinics, which provides basic maternity care and care coordination (VA, n.d). The VA's physicians can be responsible for screening women during appointments while the Maternity Care Coordinators can be instrumental in connecting pregnant veterans with appropriate treatment to address

binge drinking (VA, n.d). The provision of mental health services tailored for female veterans including brief counseling and support groups might also provide the emotional resources to treat binge drinking before and during pregnancy. Most importantly, addressing the number of stressors that result from being a veteran can help prevent alcohol dependency. This includes providing adequate housing and nutrition, mental health counseling, substance use treatment, psychoeducation and individualized resources that could lessen the effects of being a member of a disadvantaged group. It is also essential to consider the impact of obstetric racism on maternal birth outcomes among racial/ethnic minorities. Women of color have reported experiences of neglect, lack of information, disrespect, condescension, and micro aggressions that have interfered with their maternal care (Davis, 2019). In designing interventions for veterans who are pregnant, considering a cultural match between providers and care recipients could yield better treatment and overall maternal outcomes.

Limitations

Several limitations exist within this study, including the small veteran sample size. The data regarding binge drinking also relied on self-reporting from participants, which may result in exaggerated or underreported outcomes. The cross-sectional nature of the study further limits the ability to establish cause and effect, and the timing of the snapshot cannot be guaranteed to be representative. Furthermore, the survey was conducted over telephone, which excludes U.S residents who do not have access to a phone and therefore the study may not be representative of the pregnant population in the United States.

The sample also demonstrated the homogenous nature of the military, which is currently predominantly white with an amalgamation of other races/ethnicities. Furthermore, caution should be used in interpreting the interaction term in our model, given that the lower bound of the 95% confidence interval for the odds ratio was nearly one. Despite these limitations, the data from the BRFSS is considered to be nationally representative of pregnant women in the United Sates and of this study addresses an intersectional identity that has yet to be explored when considering binge-drinking among pregnant women.

Conclusion

Binge-drinking during pregnancy is a silent epidemic that leads to adverse and deleterious effects for both mother and child. This study found that being both a veteran and a racial/ethnic minority combine to create a high likelihood of binge drinking during pregnancy with a great disparity between racial/ethnic minority veterans and non-veteran whites. These results suggest a higher need for preventative measures that are tailored to the unique needs of these individuals who experience multiple stressors as a result of their membership in two vulnerable groups. Future research should aim to decipher which specific interventions and programs can be most beneficial in addressing these disparities both before and during pregnancy.

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Declarations

Conflict of interest The author declares that they have no conflict of interest.

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