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Racial/ethnic and gender differences in receipt of brief intervention among patients with unhealthy alcohol use in the U.S. Veterans Health Administration

Jessica A. Chen[a,b,*], Joseph E. Glass[b,c,g], Kara M.K. Bensley[d,e], Simon B. Goldberg[f], Keren Lehavot[a,b,g], Emily C. Williams[a,c,g]

[a] *Health Services Research & Development (HSR&D), Seattle-Denver Center of Innovation for Veteran-Centered & Value-Driven Care, Veterans Affairs (VA) Puget Sound Health Care System, 1660 S. Columbian Way, S-152, Seattle, WA 98108, USA*
[b] *Department of Psychiatry and Behavioral Sciences, University of Washington, 1959 NE Pacific St., Box 356560, Seattle, WA 98195-6560, USA*
[c] *Kaiser Permanente Washington Health Research Institute, 1730 Minor Ave, Seattle, WA 98101, USA*
[d] *Alcohol Research Group, Public Health Institute, 6001 Shellmound St, Suite 450, Emeryville, CA 94608, USA*
[e] *Department of Public Health, Bastyr University, 14500 Juanita Dr NE, Kenmore, WA 98028, USA*
[f] *Department of Counseling Psychology, University of Wisconsin – Madison, 335 Education Building, 1000 Bascom Mall, Madison, WI, 53706, USA*
[g] *Department of Health Services, University of Washington, 1959 NE Pacific St., Box 357660, Seattle, WA 98195-7660, USA*

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ABSTRACT

Objective: Brief intervention (BI) for unhealthy alcohol use is a top prevention priority for adults in the U.S, but rates of BI receipt vary across patients. We examine BI receipt across race/ethnicity and gender in a national cohort of patients from the Department of Veterans Affairs (VA)—the largest U.S. integrated healthcare system and a leader in implementing preventive care for unhealthy alcohol use.

Methods: Among 779,041 VA patients with documented race/ethnicity and gender who screened positive for unhealthy alcohol use (AUDIT-C score ≥ 5) between 10/1/09 and 5/30/13, we fit Poisson regression models to estimate the predicted prevalence of BI (EHR-documented advice to reduce or abstain from drinking) across race/ethnicity and gender.

Results: Rates of BI were lowest among Black women (67%), Black men (68%), and Asian/Pacific Islander women (68%), and highest among white men (75%), Hispanic men (75%), and Asian/Pacific Islander men (75%). A significant race/ethnicity by gender interaction indicated that the associations between race/ethnicity and gender with BI depended on the other factor. Gender differences were largest among Asian/Pacific Islander patients and were nonsignificant among American Indian/Alaska Native patients. Adjustment for covariates not expected to be on the causal pathway (e.g., age, year of AUDIT-C screen) slightly attenuated but did not change the direction of results.

Conclusions: Receipt of BI for unhealthy alcohol use varied by race/ethnicity and gender, and the impact of one factor depended on the other. Black women, Black men, and Asian/Pacific Islander women had the lowest rates of receiving recommended alcohol-related care. We found these disparities in a healthcare system that has implemented universal alcohol screening and incentivized BI for all patients with unhealthy alcohol use, suggesting that reducing disparities in alcohol-related care may require targeted interventions.

1. Introduction

Approximately 3 in 10 adults in the United States drink at unhealthy levels that put them at risk for adverse health effects, such as liver disease, heart disease, sleep disorders, depression, and stroke (National Institute on Alcohol Abuse and Alcoholism, 2010; Saitz, 2005). The adverse effects of alcohol use are amplified among racial/ethnic minorities and women, among whom drinking tends to be associated with more negative social, legal, occupational, and medical consequences (Bradley et al., 1998; Chartier, 2010; Erol & Karpyak, 2015;

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[*] Corresponding author at: Health Services Research & Development (HSR&D), Seattle-Denver Center of Innovation for Veteran-Centered & Value-Driven Care, Veterans Affairs (VA) Puget Sound Health Care System, 1660 S. Columbian Way, S-152, Seattle, WA 98108, USA.

E-mail addresses: Jessica.Chen663@va.gov (J.A. Chen), joseph.e.glass@kp.org (J.E. Glass), kbensley@uw.edu (K.M.K. Bensley), sbgoldberg@wisc.edu (S.B. Goldberg), Keren.Lehavot@va.gov (K. Lehavot), Emily.Williams3@va.gov (E.C. Williams).

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Flores et al., 2008; Mulia et al., 2009; Witbrodt et al., 2014). Population-based alcohol screening followed by brief intervention (BI) for patients who screen positive for unhealthy alcohol use are effective for reducing alcohol consumption (Jonas et al., 2012; Kaner et al., 2009; U.S. Preventive Services Task Force et al., 2018) and are the recommended standard of care for all adult primary care patients (National Institute on Alcohol Abuse and Alcoholism, 2007). Although BI can involve a range of behavioral counseling components, most interventions include specific feedback to patients to abstain or reduce drinking to within recommended limits and feedback relating alcohol use to health (Jonas et al., 2012; U.S. Preventive Services Task Force et al., 2018). Based on the evidence supporting these clinical practices, screening and BI are recommended as a top prevention priority for adults in the U.S. (Solberg et al., 2008).

However, detection of the spectrum of unhealthy alcohol use, ranging from drinking above nationally recommended limits to meeting diagnostic criteria for an alcohol use disorder (AUD) (Saitz, 2005), and receipt of alcohol-related care vary by both race/ethnicity and gender (Alvanzo et al., 2014; Bachrach et al., 2018; Brienza & Stein, 2002; Glass et al., 2016; Williams, Gupta, et al., 2016). Among those who screen positive for unhealthy alcohol use, studies using both patient report and chart-documented provider report have found higher rates of receipt of BI among racial/ethnic minorities (Dobscha et al., 2009; Williams et al., 2012) and lower rates among women (Dobscha et al., 2009; Glass et al., 2016; Volk et al., 1996; Williams, Lapham, Rubinsky, et al., 2017), but the findings have not always been consistent (Manuel et al., 2015). Identifying potential disparities in receipt of BI is critical to ensuring that all patients who may benefit from BIs receive them (Zemore et al., 2018).

While prior BI research has examined race and gender independently (Dobscha et al., 2009; Williams et al., 2012; Williams, Lapham, Rubinsky, et al., 2017), to our knowledge, no prior studies have examined the intersection of race and gender on receipt of BI. To understand why it may be important to look at race and gender in combination, we draw upon intersectionality theory, which has been described as both an “analytic sensibility” and a way of conceptualizing identity and social position (Crenshaw, 1991). Intersectionality recognizes that multiple identities or social positions intersect to create a whole that is different from the sum of its components (Bowleg, 2012; Jackson & Williams, 2006; Springer et al., 2012). Using an intersectionality lens offers a different viewpoint than examining a single axis of difference (e.g., race or gender individually), as single-axis approaches tend to center the experiences of the most privileged members within a marginalized group and obscure the experiences of those with multiple marginalized statuses (Gilbert, 2015; Moradi & Grzanka, 2017). The historical roots of intersectionality are in Black feminist thought and the articulation of Black women's marginalization as distinct from that of Black men and white women (Combahee River Collective, 1986; Truth, 1851; Wells, 1970). Intersectionality research can improve disparity reduction efforts by more precisely identifying population groups who experience the most negative outcomes and by characterizing variation within groups (Gilbert, 2015).

Within social epidemiology and public health research, quantitative approaches to studying intersectionality have often focused on the statistical interaction of two or more stigmatized statuses (Bauer & Scheim, 2019), for instance, whether the impact of poverty on consequences of alcohol use differs for racial/ethnic minorities versus whites (Glass et al., 2017). However, several authors have noted that a nonzero interaction term does not, in of itself, address the fundamental question about whether outcomes differ based on social position (Bauer & Scheim, 2019; Ward, 2019). In applying an intersectionality lens to the study of disparities in the receipt of BI, our aim was to begin with a descriptive study that examines “the distribution of outcomes across groups defined by intersectional positions of power and privilege” (Bauer & Scheim, 2019), specifically describing how minority race/ethnicity and female gender together might result in healthcare disparities that solely race/ethnicity alone or gender alone explains. Consistent with this descriptive intersectionality approach, our goal was to first establish the existence and magnitude of disparities in outcomes by providing estimates of predicted values and variances within and between cross-stratified social groups and then conduct pairwise comparisons to assess for patterns in inequalities (Bauer & Scheim, 2019; Evans, 2019).

A common challenge in quantitative intersectionality research is that examining both independent and intersectional effects requires large sample sizes. Healthcare data can facilitate quantitative intersectionality research by offering large sample sizes of smaller minority groups (Glass & Williams, 2018). The Department of Veterans Affairs (VA) is the largest integrated healthcare system in the United States (Department of Veterans Affairs, 2018), and one that serves a racially/ethnically diverse population and a growing population of women. Despite increasing diversity among VA patients, racial/ethnic minority women veterans face unique stressors due to their multiple minority status (Lehavot et al., 2019). System-level implementation of performance measurement has been proposed as one method of addressing potential health disparities (Institute of Medicine, 2006), and all VA facilities have implemented universal, population-based alcohol screening and provision of BI for those who screen positive as a performance metric (Lapham et al., 2012; Williams, Lapham, Rubinsky, et al., 2017). Therefore, VA data provide a unique opportunity to study whether disparities in alcohol-related care exist among veterans at the intersection of race/ethnicity and gender following healthcare system-wide implementation of BI. The current study used national VA data from 2009 to 2013 to examine how race/ethnicity and gender intersectionally influence receipt of BI among patients who screen positive for unhealthy alcohol use.

2. Material and methods

2.1. Data source and study sample

Data were extracted from VA's national Corporate Data Warehouse, a repository of clinical, enrollment, financial, administrative, pharmacy, and utilization data that mirrors the EHR. We used data for all VA patients who had an outpatient appointment and a documented positive screen for unhealthy alcohol use between 10/01/2009 and 05/30/2013. A positive screen was defined as an Alcohol Use Disorders Identification Test Consumption (AUDIT-C) score ≥5. While AUDIT-C scores ≥4 for men and ≥3 for women maximize sensitivity and specificity for identifying unhealthy alcohol use in validation studies (Bradley et al., 2007; Frank et al., 2008), the denominator specification for VA's performance measure for BI uses a screening threshold of ≥5 for all patients to reduce the burden of false positives (Lapham et al., 2012; Williams, Lapham, Rubinsky, et al., 2017). Positive screens were the unit of analysis, allowing multiple screens per patient to maximize generalizability. To reflect the use of the AUDIT-C as an annual screening measure, we only utilized positive screens that were not preceded by another screen in the 9 months prior (a spacing of screens fewer than 9 months apart would be indicative of nonroutine screening). This study was approved by the Institutional Review Board at the VA Puget Sound Health Care System.

2.2. Measures

2.2.1. Predictors

We categorized *race/ethnicity*, as self-reported by the patient and documented in the EHR, into mutually exclusive groups: American Indian or Alaska Native, Asian/Pacific Islander, Black, Hispanic, and White. If patients identified with multiple racial/ethnic groups, we used a single category coding approach (Black/African American > Hispanic > American Indian or Alaska Native > Asian/Pacific Islander > white) that considers both group size in the population and exposure to structural and interpersonal discrimination to increase the precision of estimates for groups that typically experience greater disadvantage in health care (Krieger, 2014).

We extracted *gender* from the EHR and defined it as either male or female.

2.2.2. Outcome

We defined brief intervention (BI) as alcohol-related advice to abstain from drinking or reduce drinking to within recommended limits documented within 0–14 days of the positive alcohol screen. Consistent with prior studies (Bensley et al., 2019; Chen et al., 2018; Owens et al., 2018; Williams, Lapham, Andersen, et al., 2017; Williams, Lapham, Bobb, et al., 2017), we extracted our measure of BI from text data called "health factors" that are generated from the VA's clinical decision support tool ("clinical reminder"), a templated form used to prompt and document BI (Williams et al., 2014). This provider-documented, EHR text-based measure of BI has been found to have good concordance (73%) with patient-reported BI (Lapham et al., 2015) and is similar to methods used to evaluate implementation of BI in non-VA healthcare systems (Chi et al., 2017; Slain et al., 2014).

2.2.3. Covariates

We extracted covariates from the EHR and selected them a priori based on the expectation that they would influence the outcome but not be causally related to race/ethnicity or gender (Alvanzo et al., 2014; Dobscha et al., 2009; Glass et al., 2016; Hebert et al., 2008; Williams et al., 2012). Covariates included age, marital status, and fiscal year of AUDIT-C screening. We categorized *age* at the time of AUDIT-C screening as 18–29, 30–44, 45–64, and 65+ years. We categorized *marital status* at the time of AUDIT-C screening as never married/single, divorced/separated, widowed, or married. We categorized *fiscal year of AUDIT-C*, which begins on October 1 of a given year and ends on September 30 of the following year, into FY2010, 2011, 2012, and 2013 (partial year up until 05/30/2014), and we measured it to account for changes in BI clinical practice over time.

2.2.4. Descriptive variables

We also measured several variables for descriptive purposes, specifically: VA eligibility status (an approximation of disability), mental health and substance use disorder comorbidities, AUD, and alcohol-specific medical conditions. *VA eligibility status* reflects the extent of a patient's VA benefits, particularly copayment requirements, and is determined by both the patient's disability status and the patient's ability to pay. Higher levels of eligibility reflect greater levels of disability and/or diminished ability to pay and therefore more benefits (e.g., fewer or no copays). We identified *mental health comorbidities*, including major depression, other mood disorders, PTSD, anxiety disorders, and serious mental illness; *substance use disorder comorbidities*, including stimulant use disorder, opioid use disorder, and other drug use disorders; *AUD*; and *alcohol-specific medical conditions* (e.g., alcohol-induced cardiomyopathy, alcoholic cirrhosis of liver) using ICD-9 diagnosis codes.

2.3. Analytic strategy

First we conducted descriptive, patient-level analyses to characterize the study sample using each patient's first positive AUDIT-C screen in the study period. Second, with positive screens as the unit of analysis clustered within patient, we fit Poisson regression models to estimate the prevalence ratio, predicted prevalence, and 95% confidence intervals (CIs) for receipt of BI by racial/ethnic group and by gender, individually and in combination. We chose a modified Poisson regression approach over logistic regression for binary data because the outcome was common and because it presents fewer convergence problems than binominal models (Zou, 2004). We calculated standard errors using a robust sandwich estimator to account for overly conservative error estimates when the Poisson model is used for binary outcomes and to account for correlation resulting from multiple screens for the same patient over time (Liang & Zeger, 1986; Zou, 2004). We obtained adjusted predicted prevalence estimates of BI using recycled predictions, a method that holds all covariates constant at the actual values found in the sample while allowing the predictors of interest (race, gender) to vary (Williams, 2012). The purpose of obtaining predicted prevalence rates was to first establish the presence of group-specific differences in our primary outcome (Ward et al., 2019). Third, we evaluated a multiplicative race by gender interaction using a Wald test ($\alpha = 0.05$) of the interaction term representing all categories of race and gender. A significant interaction term indicated that the association between one social category (e.g., race/ethnicity) and receipt of BI depended on an individual's position within the other social category (e.g., gender), and pairwise comparisons further tested for patterns in inequalities using $\alpha = 0.05$.

We ran regression models as both unadjusted (model 1, primary model) and adjusted in two steps. We fit two minimally adjusted models to account (a) only for fiscal year of the AUDIT-C screen (model 2) and (b) after adding in age and marital status (model 3). We chose to use complete case analysis for our primary model as it has been found to be comparable to multiple imputation and less biased than a missing indicator approach for missing race/ethnicity data in large healthcare databases (Henry et al., 2013); however, we also re-ran all models using multiple imputation ($N = 10$ imputations) as an additional check for potential bias. We conducted all analyses in Stata Version 16.

3. Results

Between October 1, 2009, and May 30, 2013, there were 1,172,606 positive alcohol screens (AUDIT-C ≥ 5), representing 830,825 unique patients. Due to missing race/ethnicity data, our primary model using complete case analysis included 94.0% of screens ($n = 1,101,703$), representing 779,041 unique patients. Distribution of the sample across race/ethnicity and gender is described in Table 1. In the sample, 3.1% ($n = 23,841$) were women and 26.9% ($n = 210,562$) were nonwhite. Black patients made up the largest racial/ethnic minority group, reflecting about 17.5% ($n = 135,955$) of the sample. Women constituted a larger proportion of American Indian/Alaska Native (5.5%, $n = 418$), Black (4.8%, $n = 6500$), Asian/Pacific Islander (3.8%, $n = 432$), and Hispanic patients (3.2%, $n = 1750$) than white patients (2.6%, $n = 14,741$). Additional characteristics of the sample are described in

Table 1
Distribution of sample stratified by race/ethnicity and gender ($n = 799,041$).

	White (n = 569,479; 73.1% overall)		Asian/Pacific Islander (n = 11,252; 1.4% overall)		American Indian/Alaska Native (n = 7532; 1.0% overall)		Hispanic (n = 54,823; 7.0% overall)		Black (n = 135,955; 17.5% overall)		Total (n = 779,041, 100.0%)	
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
Male	554,738	(97.4)	10,820	(96.2)	7114	(94.5)	53,073	(96.8)	129,455	(95.2)	755,200	(96.9)
Female	14,741	(2.6)	432	(3.8)	418	(5.5)	1750	(3.2)	6500	(4.8)	23,841	(3.1)

Table 2
Characteristics of VA patients who screened positive for unhealthy alcohol use stratified by gender and race/ethnicity (2009–2014).

Population characteristics stratified by gender and racial/ethnic groups	White				Asian/Pacific Islander				American Indian/Alaska Native				Hispanic				Black				Total	
	Men		Women		Men		Women		Men		Women		Men		Women		Men		Women			
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
Age at AUDIT-C screen																						
18–29	63,869	(11.5)	3577	(24.3)	2412	(22.3)	167	(38.7)	1005	(14.1)	92	(22.0)	10,805	(20.4)	709	(40.5)	8046	(6.2)	1297	(20.0)	91,979	(11.8)
30–44	67,456	(12.2)	4359	(29.6)	2214	(20.5)	135	(31.3)	1319	(18.5)	162	(38.8)	10,872	(20.5)	639	(36.5)	20,623	(15.9)	2129	(32.8)	109,908	(14.1)
45–64	272,051	(49.0)	6164	(41.8)	4421	(40.9)	121	(28.0)	3715	(52.2)	154	(36.8)	23,686	(44.6)	390	(22.3)	85,084	(65.7)	3013	(46.4)	398,799	(51.2)
65+	151,362	(27.3)	641	(4.3)	1773	(16.4)	9	(2.1)	1075	(15.1)	10	(2.4)	7710	(14.5)	12	(0.7)	15,702	(12.1)	61	(0.9)	178,355	(22.9)
Marital status																						
Divorced/separated	162,868	(29.7)	5259	(36.2)	2123	(20.0)	129	(30.6)	2285	(32.6)	141	(34.1)	13,564	(25.9)	502	(29.4)	39,273	(30.7)	1995	(31.3)	228,139	(29.6)
Married	252,013	(45.9)	3772	(26.0)	4974	(46.8)	104	(24.6)	2602	(37.1)	105	(25.4)	23,595	(45.1)	396	(23.2)	40,751	(31.9)	1194	(18.8)	329,506	(42.8)
Never married/single	110,631	(20.2)	5059	(34.8)	3262	(30.7)	182	(43.1)	1887	(26.9)	147	(35.5)	13,962	(26.7)	789	(46.2)	43,771	(34.2)	3017	(47.4)	182,707	(23.7)
Widowed	22,948	(4.2)	445	(3.1)	274	(2.6)	7	(1.7)	233	(3.3)	21	(5.1)	1213	(2.3)	22	(1.3)	4111	(3.2)	159	(2.5)	29,433	(3.8)
VA eligibility status																						
Full benefits	92,762	(16.8)	3290	(22.4)	2723	(25.3)	111	(25.8)	1549	(21.8)	80	(19.1)	11,387	(21.5)	377	(21.7)	24,044	(18.6)	1728	(26.6)	138,051	(17.8)
< 50% service connected	118,439	(21.4)	3601	(24.5)	2766	(25.7)	109	(25.3)	1447	(20.4)	94	(22.5)	12,236	(23.1)	435	(25.1)	29,318	(22.7)	1653	(25.5)	170,098	(21.9)
Copay required	342,004	(61.8)	7797	(53.1)	5278	(49.0)	210	(48.8)	4095	(57.7)	244	(58.4)	29,254	(55.3)	924	(53.2)	75,850	(58.7)	3105	(47.9)	468,761	(60.3)
AUDIT C Fiscal Year (FY)																						
FY2010	237,984	(42.9)	5481	(37.2)	4312	(39.9)	162	(37.5)	2901	(40.8)	142	(34.0)	21,150	(39.9)	608	(34.7)	50,474	(39.0)	2066	(31.8)	325,280	(41.8)
FY2011	158,743	(28.6)	4210	(28.6)	3147	(29.1)	125	(28.9)	2090	(29.4)	132	(31.6)	15,425	(29.1)	499	(28.5)	37,275	(28.8)	1865	(28.7)	223,511	(28.7)
FY2012	116,663	(21.0)	3618	(24.5)	2450	(22.6)	97	(22.5)	1561	(21.9)	100	(23.9)	12,056	(22.7)	471	(26.9)	29,275	(22.6)	1788	(27.5)	168,079	(21.6)
FY2013	41,348	(7.5)	1432	(9.7)	911	(8.4)	48	(11.1)	562	(7.9)	44	(10.5)	4442	(8.4)	172	(9.8)	12,431	(9.6)	781	(12.0)	62,171	(8.0)
Major depression	34,399	(6.2)	2576	(17.5)	783	(7.2)	84	(19.4)	621	(8.7)	78	(18.7)	4224	(8.0)	286	(16.3)	10,729	(8.3)	1318	(20.3)	55,098	(7.1)
Other mood	116,246	(21.0)	5931	(40.2)	2189	(20.2)	154	(35.6)	1934	(27.2)	182	(43.5)	12,124	(22.8)	638	(36.5)	34,832	(26.9)	2861	(44.0)	177,091	(22.7)
PTSD	86,361	(15.6)	3539	(24.0)	2618	(24.2)	105	(24.3)	1764	(24.8)	126	(30.1)	12,166	(22.9)	502	(28.7)	23,600	(18.2)	1851	(28.5)	132,632	(17.0)
Anxiety	58,500	(10.5)	3711	(25.2)	1018	(9.4)	95	(22.0)	773	(10.9)	81	(19.4)	5562	(10.5)	342	(19.5)	9843	(7.6)	1115	(17.2)	81,040	(10.4)
Serious mental illness	24,054	(4.3)	1742	(11.8)	484	(4.5)	38	(8.8)	426	(6.0)	39	(9.3)	2344	(4.4)	156	(8.9)	10,651	(8.2)	818	(12.6)	40,752	(5.2)
Stimulants	12,893	(2.3)	650	(4.4)	238	(2.2)	18	(4.2)	225	(3.2)	24	(5.7)	2036	(3.8)	63	(3.6)	20,766	(16.0)	679	(10.4)	37,592	(4.8)
Opioid	8689	(1.6)	413	(2.8)	107	(1.0)	7	(1.6)	136	(1.9)	7	(1.7)	854	(1.6)	20	(1.1)	3908	(3.0)	120	(1.8)	14,261	(1.8)
Other drug	19,967	(3.6)	847	(5.7)	343	(3.2)	13	(3.0)	445	(6.3)	30	(7.2)	1984	(3.7)	62	(3.5)	11,899	(9.2)	549	(8.4)	36,139	(4.6)
Alcohol use disorder	168,871	(30.4)	5035	(34.2)	2783	(25.7)	113	(26.2)	2898	(40.7)	173	(41.4)	15,940	(30)	473	(27)	55,054	(42.5)	2425	(37.3)	253,765	(32.6)
Alcohol-specific medical conditions	9555	(1.7)	215	(1.5)	126	(1.2)	1	(0.2)	174	(2.4)	15	(3.6)	937	(1.8)	20	(1.1)	2271	(1.8)	72	(1.1)	13,386	(1.7)
Receipt of BI w/ in 14 day of positive screen	401,589	(72.4)	10,355	(70.2)	7940	(73.4)	296	(68.5)	5002	(70.3)	294	(70.3)	38,693	(72.9)	1236	(70.6)	86,752	(67.0)	4291	(66.0)	556,448	(71.4)

Total number with marital status = 769,785 and with VA eligibility status documented = 776,910, but all remaining variables were not missing any data (n = 799,041). *P*-values for all chi-square tests < 0.001.
Abbreviations: PTSD = Posttraumatic stress disorder; BI = Brief Intervention.

Table 3
Predicted prevalence and 95% CI of receipt of brief intervention by race/ethnicity and by gender, independently.

	Predicted prevalence (%)	95% CI	RR	95% CI	*p*-Value
		Unadjusted			
Race/Ethnicity					
American Indian/Alaska Native	72.7	[71.8, 73.6]	0.97	[0.96, 0.99]	< .001
Asian/Pacific Islander	74.7	[74.0, 75.5]	1.00	[0.99, 1.01]	.842
Black	68.1	[67.9, 68.3]	0.91	[0.91, 0.92]	< .001
Hispanic	74.7	[74.3, 75.0]	1.00	[1.00,1.00]	.919
White	74.6	[74.5, 74.7]	(Ref)		(Ref)
Gender					
Women	70.9	[70.3, 71.4]	0.96	[0.95, 0.97]	< .001
Men	73.6	[73.6, 73.7]	(Ref)		(Ref)
		Adjusted			
Race/Ethnicity					
American Indian/Alaska Native	73.0	[72.1, 73.9]	0.98	[0.97, 0.99]	< .001
Asian/Pacific Islander	74.9	[74.2, 75.6]	1.00	[0.99, 1.01]	.542
Black	68.4	[68.2, 68.6]	0.92	[0.91, 0.92]	< .001
Hispanic	74.9	[74.6, 75.2]	1.00	[1.00, 1.01]	.195
White	74.7	[74.6, 74.8]	(Ref)		(Ref)
Gender					
Women	71.4	[70.8, 73.8]	0.97	[0.96, 0.98]	< .001
Men	73.7	[73.6, 73.8]	(Ref)		(Ref)

Note. Adjusted for age, marital status, and fiscal year of AUDIT-C.

Table 2, stratified by both race/ethnicity and gender. Most patients (74.1%, n = 577,154) were 45 years and older and slightly less than half (42.8%, n = 329,506) were married. In this sample, 17.8% (n = 138,051) of patients had full VA benefits, an indicator of higher disability or greater socioeconomic disadvantage. Mental health disorders were common: 7.1% (n = 55,098) of the sample had a documented major depression diagnosis, 22.7% (n = 177,091) had a documented other depressive or mood disorder diagnoses (excluding bipolar), and 17.0% (n = 132,632) had a documented PTSD diagnosis. While 32.6% (n = 253,765) of the sample had a documented AUD diagnosis, other substance use disorders were less common (generally ≤5%).

Across the entire sample, the prevalence of BI was 71.4%. The prevalence of BI differed by race/ethnicity and gender when we examined each independently, with American Indian/Alaska Native and Black patients receiving BI at lower rates than white patients and women receiving BI at lower rates than men (Table 3). When examining gender and race/ethnicity simultaneously, in model 1 (unadjusted), the prevalence of receiving BI was lowest among Black women (66.8% [65.7–67.8%]), Black men (68.1% [67.9–68.4%]), and Asian/Pacific Islander women (68.4% [64.3–72.5%]); and highest among white men (74.7% [74.6–74.8%]), Hispanic men (74.7% [74.4–75.1%]), and Asian/Pacific Islander men (74.9% [74.2–75.6%]) (Table 4 and Fig. 1). Additional adjustment for fiscal year of the AUDIT-C (model 2) and demographics (model 3) did not alter results substantially but did result in a small increase in predicted receipt of BI among Black men and among women across all categories of race/ethnicity (however, all differences ≤1%; see Table 4). The Wald test of the interaction terms between race/ethnicity and gender was significant (χ^2 (10) = 2.8e+06, $p < .001$) across all models, suggesting that the independent associations between race/ethnicity and gender with BI depended on the other factor. The prevalence ratio between women and men was largest among Asian/Pacific Islander patients and was not significantly different from 1.0 among American Indian/Alaska Native patients.

4. Discussion

In a national cohort of VA patients who screened positive for unhealthy alcohol use, we examined the intersectional effects of race/ethnicity and gender on receiving BI, an evidence-based intervention widely recommended for addressing unhealthy alcohol use in primary care. Our analyses were guided by an intersectionality framework with a goal of better understanding the interdependence among systems of power, privilege, and oppression—represented by the constructs of race/ethnicity and gender—that lead to differential access to resources and health risks (Bowleg, 2012). While previous studies have examined receipt of BI by race/ethnicity and gender as independent factors, the current study is the first to assess these characteristics intersectionally. Our findings suggest that, among veterans, receipt of BI for unhealthy alcohol use varied by race/ethnicity and gender, and that the impact of one social position on receipt of alcohol-related care depended on the other. These results highlight that disparity reduction interventions must be attuned to the ways in which social stratification by race/ethnicity and gender produces “different life experiences and outcomes for those at different intersections” (Bauer & Scheim, 2019, p. 237).

Perhaps the most concerning disparity affecting any single race/ethnicity-by-gender group identified in the current study was that Black women had the lowest rate of receipt of BI, though the difference between Black women and Black men was relatively small (68.1% vs. 68.9%, respectively). The disparity for Black women is concerning because it suggests decreased opportunities to benefit from an evidence-based alcohol intervention for a group that has historically faced healthcare disparities across multiple conditions that are negatively impacted by alcohol use, including increased prevalence of hypertension (Hertz et al., 2005), lower breast cancer survival rates (Silber et al., 2013), worse perinatal outcomes (Creanga et al., 2017), and substantially higher rates of HIV (Matson et al., 2018; Williams, Hahn, et al., 2016) than dominant groups.

There were additional intersectional differences identified in the current study that highlighted how the effect of gender depended on race and vice versa. There was a particularly large gender difference among Asian/Pacific Islander patients relative to that of other racial/ethnic groups. Asian/Pacific Islander men had one of the highest adjusted rates of BI and Asian/Pacific Islander women had one of the lowest rates of all groups. Relatively little is known about gender differences among Asian/Pacific Islanders with regard to interventions for unhealthy alcohol use. The broader alcohol and substance use literature has not consistently found gender differences in this population, and one confounding factor may be group heterogeneity, which has led to the recommendation to examine Asian Americans and Pacific Islanders separately to better understand alcohol/substance use and treatment needs (Wu & Blazer, 2015). In contrast, gender differences were in the opposite direction for American Indian/Alaskan Natives, where women had a higher rate of BI than men. While prior research has examined

Table 4
Prevalence of receipt of brief intervention by race/ethnicity and gender intersectionally and comparisons within race/ethnicity.

Race/Ethnicity	Women		Men				
	%	(95% CI)	%	(95% CI)	RR	(95% CI)	*p*-Value
Model 1: unadjusted							
American Indian/Alaska Native	72.9	(69.1, 76.7)	72.7	(71.8, 73.6)	1.00	(0.95, 1.06)	.911
Asian/Pacific Islander	68.4	(64.3, 72.5)	74.9	(74.2, 75.6)	0.91	(0.86, 0.97)	.004
Black	66.8	(65.7, 67.8)	68.1	(67.9, 68.4)	0.98	(0.96, 1.00)	.013
Hispanic	71.9	(70.0, 73.8)	74.7	(74.4, 75.1)	0.96	(0.94, 0.99)	.006
White	71.4	(70.8, 72.1)	74.7	(74.6, 74.8)	0.96	(0.95, 0.96)	< .001
Model 2: minimally adjusted for fiscal year of AUDIT-C							
American Indian/Alaska Native	72.6	(68.8, 76.4)	72.6	(71.7, 73.5)	1.00	(0.95, 1.05)	.982
Asian/Pacific Islander	68.6	(64.4, 72.7)	74.8	(74.1, 75.5)	0.92	(0.86, 0.97)	.005
Black	66.3	(65.3, 67.4)	68.1	(67.9, 68.4)	0.97	(0.96, 0.99)	.001
Hispanic	71.7	(69.8, 73.7)	74.7	(74.4, 75.0)	0.96	(0.93, 0.99)	.004
White	71.4	(70.7, 72.0)	74.7	(74.6, 74.8)	0.95	(0.95, 0.96)	< .001
Model 3: minimally adjusted for AUDIT-C year, age, and marital status							
American Indian/Alaska Native	73.8	(69.9, 77.6)	72.9	(72.0, 73.8)	1.01	(0.96, 1.07)	.674
Asian/Pacific Islander	69.4	(65.2, 73.6)	75.1	(74.3, 75.8)	0.93	(0.87, 0.98)	.013
Black	67.1	(66.0, 68.2)	68.4	(68.2, 68.7)	0.98	(0.97, 1.00)	.023
Hispanic	72.7	(70.7, 74.6)	75.0	(74.6, 75.3)	0.97	(0.94, 1.00)	.026
White	72.0	(71.3, 72.7)	74.7	(74.6, 74.8)	0.96	(0.95, 0.97)	< .001

gender differences in and determinants of alcohol use among American Indian/Alaskan Native populations (Collins, 2002; Les Whitbeck et al., 2004; Oetzel et al., 2007; Walters et al., 2002), relatively little is known about receipt of alcohol-related care and how this may vary by gender. Future alcohol disparities research would benefit from leveraging large healthcare system data to examine intersectional effects in smaller racial/ethnic groups and to explore within-group variability beyond race and gender (Glass & Williams, 2018). In-depth qualitative studies may be hypothesis-generating and add a nuanced understanding of the heterogeneity encompassed within populations that are often treated as unitary groups in quantitative studies.

While intersectionality theory argues that the impact of race/ethnicity and gender cannot be considered independently of the other, it nonetheless remains pragmatically useful to describe their independent contributions to inform healthcare quality guidelines that do not yet consider intersectionality and to compare our results with previous studies that have examined disparities using a single-axis approach. In terms of the independent effect for gender, our findings are consistent with prior literature that has found under-receipt of BI for women compared to men (Dobscha et al., 2009; Glass et al., 2016; Williams, Lapham, Rubinsky, et al., 2017). Future research is needed to disentangle the extent to which these differences can be attributed to system, provider, and patient-level factors. Research has noted that the stigma associated with unhealthy alcohol use may be magnified among women due to social and cultural gender norms (Peralta, 2010), and this may affect how providers respond to women's disclosures of unhealthy alcohol use (Cucciare et al., 2016; Lewis et al., 2016) and could also affect providers' willingness to document alcohol interventions such as BI in a patient's medical record. Gender differences in AUD rates may also affect provider behavior. Given that prior research has found discordance between provider- and patient-reported BI (Hoggatt & Hepner, 2018), future research should investigate concordance between patient- and

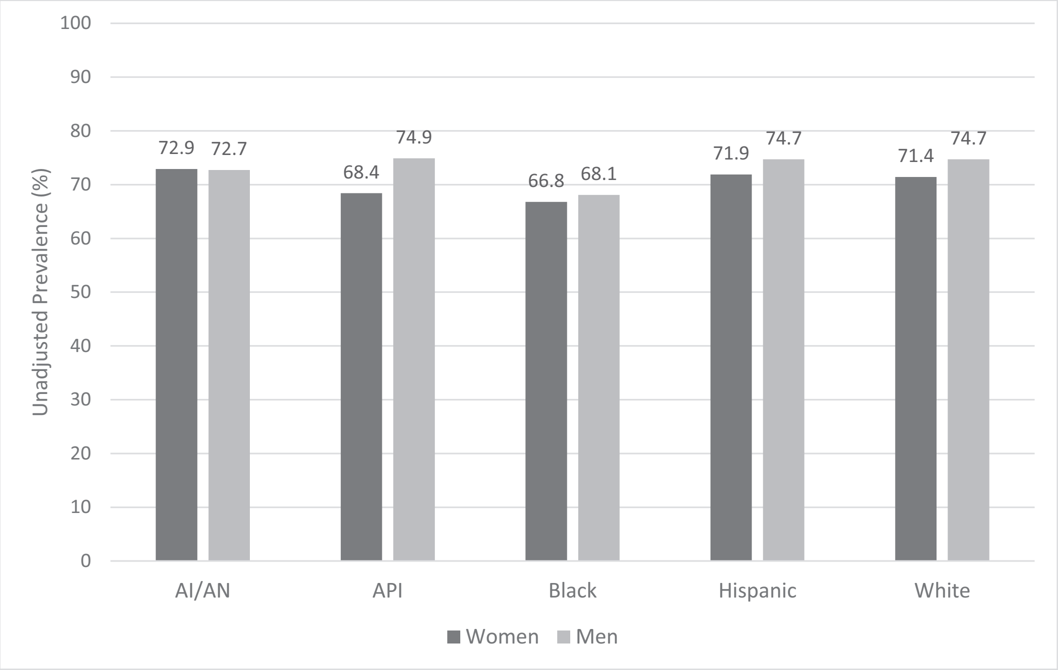

Fig. 1. Prevalence of brief intervention among VA patients with unhealthy alcohol use, by race/ethnicity and gender intersectionally.

provider-reports and whether this varies by gender and race/ethnicity.

We found that, among those with unhealthy alcohol use, American Indian/Alaska Native and Black patients had the lowest rates of BI. Racial/ethnic minorities—particularly Black/African American, American Indian/Alaska Native, and Hispanic individuals—often face more severe social consequences at similar levels of alcohol consumption as white individuals (Chartier, 2010; Mulia et al., 2009; Witbrodt et al., 2014). Disparities in access to healthcare may exacerbate existing social and legal disparities. Disparities in BI could also have a downstream impact on referral to and receipt of specialty substance use disorder treatment and specific evidence-based treatments such as pharmacotherapy for AUD. Prior research in the VA has found that Black and nonwhite Hispanic veterans are actually more likely to receive specialty substance use disorder treatment (Bensley et al., 2017; Glass et al., 2010), highlighting that the relationship between documented BI and receipt of specialty care may not always be straightforward (Frost et al., 2019). On the other hand, Black patients are less likely to receive pharmacotherapy for AUD than white patients in the VA (Williams, Gupta, Rubinsky, et al., 2017), which suggests that the distribution of alcohol care outcomes across race/ethnicity may vary depending on the intervention. To our knowledge, the existing literature has not discussed that American Indian/Alaska Native patients in the VA were particularly at risk for under-receipt of BI. This study highlights that American Indian and Alaska Native patients with unhealthy alcohol use may be a vulnerable population that is both understudied and underserved in the VA.

4.1. Limitations

Because we relied on EHR data in the current study, we were limited in our ability to explore information about patients' lived experiences, their interactions with providers, and social determinants of health (e.g., housing, food security, employment, and income). Therefore, the mechanisms underlying the intersectional disparities in BI receipt that this study identified are unclear. Future research should investigate these multi-level contributors to healthcare disparities using both quantitative and qualitative methods (Moradi & Grzanka, 2017). To advance the study of healthcare disparities beyond “first-generation” identification and documentation (Kilbourne et al., 2006; Thomas et al., 2011), large health systems should comprehensively assess social determinants of health in routine care and improve documentation of these factors in the EHR (Glass & Williams, 2018). Such efforts will advance our ability to use quantitative data to understand the social, economic, political, and ecological factors that influence individuals' exposure to risks and the mechanisms underlying alcohol-related disparities to inform future disparity reduction efforts. Additionally, qualitative and mixed methods approaches are critical to elucidate the heterogeneity of individuals' lived experiences and how healthcare impacts these experiences. Despite the limitations associated with reliance on EHR data, a major strength of this study is that we were able to examine race/ethnicity-by-gender groups that, in other studies, often have to be collapsed due to sample size limitations (Glass & Williams, 2018).

The data from the current study were not collected beyond 2013, which limits our ability to comment on the current state of disparities in BI within the VA. Since 2013, the VA has grown its initiatives in health equity, including establishing an Office of Health Equity and a Health Equity Action Plan (Department of Veterans Affairs, 2017; Moy, 2019). It is possible that policy-level changes have modified or ameliorated the disparities that were documented during this study. Future research could compare patterns of BI found in this study to patterns found after the VA implemented its health equity initiatives. However, changes in rates of BI have been responsive only to specific BI implementation efforts (Lapham et al., 2012), and as no further BI implementation efforts (equity-focused or otherwise) have occurred since data were extracted for the current study, we have no reason to believe that patterns have changed. Data from the current study suggest that disparities remained even after the VA's multifaceted, multi-year healthcare system-wide implementation of BI (Lapham et al., 2012), suggesting that focused disparity reduction efforts may be needed.

We do not know whether the same pattern of findings would hold in other healthcare systems or in the general U.S. population. As others have noted, the VA has reduced financial barriers to access compared to private sector healthcare systems, and this may reduce racial/ethnic disparities in health outcomes among VA patients (Wong et al., 2019) and improve access to and initiation of AUD treatment among veterans relative to the general population (Goldberg et al., 2020).

4.2. Conclusion

In this study, we demonstrated that receipt of BI varied across race/ethnicity and gender intersectionally in a large, national sample of VA patients with unhealthy alcohol use. Black women, Black men, and Asian/Pacific Islander women had the lowest rates of receiving recommended alcohol-related care. We found these disparities in a healthcare system that has implemented universal alcohol screening and incentivized BI for all patients with unhealthy alcohol use, suggesting that, in addition to system-level implementation of performance measures, targeted interventions may be needed to specifically reduce disparities in alcohol-related care and ensure that patients receive recommended care equitably.

Author statement

Jessica A. Chen: Conceptualization, Methodology, Formal analysis, Writing - Original Draft, Writing - Review & Editing. Joseph E. Glass: Conceptualization, Methodology, Formal analysis, Writing - Review & Editing. Kara M. Bensley: Conceptualization, Methodology, Formal analysis, Writing - Review & Editing. Simon B. Goldberg: Conceptualization, Methodology, Writing - Review & Editing. Keren Lehavot: Conceptualization, Methodology, Writing - Review & Editing. Emily C. Williams: Conceptualization, Methodology, Formal analysis, Writing - Original Draft, Writing - Review & Editing, Investigation, Project administration, Funding acquisition.

Contributors

All authors contributed to the article. JAC served as the lead author of the manuscript and led interpretation and preparation of the manuscript prior to submission. ECW, KMB, and JAC conducted data analyses. JEG, KMB, SBG, and KL contributed to analytic design and interpretation. ECW served as the senior principal investigator of the study, guiding all aspects of study design, analysis, and interpretation, and oversaw preparation of the manuscript prior to submission. ECW presented a preliminary version of this study at the 2017 INEBRIA Conference. All authors reviewed iterative drafts of the manuscript prior to submission and contributed to its completion.

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Declaration of competing interest

All authors declare no potential competing interests. The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs, the University of Washington, or the Kaiser Permanente Washington Health Research Institute.

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