JOURNAL OF BEHAVIORAL HEALTH AND PSYCHOLOGY, 2026
VOL 15, NO. 1, PAGE 1 – 7

RESEARCH ARTICLE

Open Access

Race Perceptions Associated with Substance Use and Poor Mental Health

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ABSTRACT

Background: Racial identity and perceived treatment based on race may influence health behaviors, but limited research has examined these associations across racial and ethnic groups. This study evaluated whether frequency of thinking about race and perceived treatment compared to other races were associated with binge drinking, heavy drinking, cannabis use, tobacco smoking, and poor mental health.

Methods: Analyses were based on cross-sectional data from the 2022 and 2023 Behavioral Risk Factor Surveillance System (BRFSS), including over 300,000 adults from U.S. states and the District of Columbia. Logistic regression models were employed, which adjusted for age, sex, marital status, race/ethnicity, annual household income, education, and health insurance status.

Results: Individuals who thought about their race more frequently or felt they were treated worse than people of other races had significantly higher odds of binge drinking, heavy drinking, cannabis use, and poor mental health. Those who reported being treated better than people of other races also had significantly higher odds of binge drinking, heavy drinking, cannabis use, and poor mental health.

Conclusions: These findings suggest that not only is racism related to substance use and poor mental health, but racial superiority may also increase the risk of these outcomes. Race-related perceptions are linked to substance use and mental health and should be considered in efforts to reduce health disparities.

ARTICLE HISTORY

Received Date: 30 December 2025
Accepted Date: 27 January 2026
Published Date: 16 February 2026

KEYWORDS

Binge drinking, Cannabis, Disparities, Heavy drinking, Mental illness, Race.

Abbreviations

BRFSS: Behavioral Risk Factor Surveillance System, NH: Non-Hispanic.

Introduction

Social identity theory aims to explain how individuals identify their place in society in terms of the groups in which they belong [1]. Race is an important social category in social identity theory wherein individuals derive some of their identity and self-esteem from their racial group. Racial categorization, comparison, and identification can lead to stereotyping, bias, and discrimination of other racial groups, and minority group members experiencing feelings of exclusion and lower self-esteem when compared with a dominant group [2-5].

Race has been shown to be stereotypically linked to perceptions of social status [6] and feeling like a member of the racial or ethnic majority or minority within a given context may shape how people feel about themselves. Research rooted in social identity theory has shown that African Americans who strongly identify with their racial group and view it positively tend to report higher self-esteem, greater feelings of self-mastery, and fewer symptoms of depression [7]. Alternatively, when individuals hold more negative evaluations of their group, strong racial identification may be linked to worse psychological outcomes, such as lower mastery and greater depressive symptoms, with both societal messages and internalized racism [7].

Higher levels of perceived racial discrimination may increase one's likelihood to use and abuse substances such as alcohol, cannabis, and tobacco. These substances are often used as coping mechanisms to combat stress [8], which stress could increase with the presence of perceived racial discrimination. In the current study, we will explore the relationship between frequency of thinking about race and perception of being treated worse than people of other races according to race/ethnicity. Two specific hypotheses will be tested. First, more frequent thought about race/ethnicity is associated with higher odds of binge drinking, heavy alcohol drinking, cannabis use, tobacco smoking, and poor mental health. Second, the perception of being treated differently than people or other races is associated with higher odds of binge drinking, heavy alcohol drinking, cannabis use, tobacco smoking, and poor mental health.

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Materials and Methods

Data

This study uses data from the Behavior Risk Factor Surveillance System (BRFSS), which is a nationwide random probability telephone survey that collects individual-level data from U.S. states, territories, and the District of Columbia. The BRFSS is used to collect risk behavior data among adults (aged 18 years or older) regarding risk behaviors and other health-related information. The BRFSS consists of three parts: (1) core demographic questions, health condition questions, and behavior questions asked to all participating U.S. states, territories, and the District of Columbia; (2) optional modules on specific topics (e.g., cannabis use); and (3) area-added questions for their own specific use [9].

The current study involves cross-sectional data collected in the 2022 and 2023 BRFSS surveys, since these years have asked specific questions about race perceptions. These questions were asked by 29 states and the District of Columbia (n = 303,508). Each of these areas asked questions about binge drinking, heavy alcohol drinking, and tobacco smoking. Thirteen of these areas also asked questions about cannabis use (n = 100,447). The level of binge drinking, heavy alcohol drinking, and current tobacco smoking in the areas asking questions about race perceptions versus not are 15.3% and 16.2%, 5.9% and 6.3%, and 12.3% and 10.6%, respectively.

Median response rates for the participating areas are 45% in 2022 and 45% in 2023 [9,10].

All participants provided informed verbal consent prior to the interview. A description of the BRFSS survey design, questionnaires, and data collection method is available elsewhere [10].

Measures

Race perception variables were "How often do you think about your race? Would you say never, once a year, once a month, once a week, once a day, once an hour, or constantly?" and "Within the past 12 months, do you feel that in general you were treated worse than, the same as, or better than people of other races?" For the former question, we combined "once a day", "once an hour" or "constantly" into one group, because the percentage in these categories were comparatively small (6.17%, 0.32%, and 4.99%, respectively).

Demographic variables included were age (18-34, 35-54, ≥55), sex (men, women), race/ethnicity (non-Hispanic [NH] White, non-Hispanic Black, Hispanic, and Other), marital status (married/cohabitating, previously married, never married) education level (< high school, high school, some college, and college), and employment status (employed, not employed, not in workforce).

There were five outcome variables: binge drinking, heavy alcohol drinking, cannabis use in the past 30 days, current tobacco smoking, and mental health. Binge drinking was based on whether in the past 30 days males consumed five or more drinks on one occasion, and females consumed four or more drinks on one occasion. Heavy drinkers were adult men having more than 14 drinks per week and adult women having more than seven drinks per week. Cannabis use was assessed by the question, "During the past 30-days, on how many days did you use marijuana or cannabis?" [11]. Smoking status was classified as current smoker, former smoker, and non-smoker. The BRFSS treats marijuana and cannabis as synonymous, but for scientific accuracy, "cannabis" will be used throughout the paper. The mental health variable was based on the 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." This variable was coded as 0 days, 1-13 days, and 14-30 days, according to the BRFSS recommended categorization.

Statistical Analysis

The data were described using numbers, percentages, and odds ratios (ORs). Percentages and ORs were estimated using survey stratum, primary sampling units, and sampling weights. Tests of the significance of the association between categorical variables were based on the Rao-Scott Chi-square. Logistic regression models were used to assess the association between each of the five outcome variables and frequency of thinking about their race, adjusted for age, sex, marital status, race/ethnicity, annual household income, education, and health insurance. Adjusted odds ratios were also estimated to assess whether each of the five outcome variables was associated with how individuals felt they were treated compared to other races. Odds ratios (ORs) were reported with their corresponding 95% confidence intervals (CIs). Statistical significance of an OR occurred if the bounds of the CI did not overlap 1. Statistical significance was based on the 0.05 level. Statistical analyses were conducted using Statistical Analysis System (SAS) software, version 9.4 (SAS Institute Inc., Cary, NC, USA, 2016).

Results

The distribution of selected demographic and behavior variables appear in Table 1. A higher percentage of participants are at least 55 years of age, women, NH White, married/cohabitating, have higher education, and are employed. Binge drinking is about three times more common than heavy drinking, and current smoking is slightly less common than cannabis use in the past month.

The frequency of thinking about one's race was significantly associated with race/ethnicity (Table 2). Specifically, NH Whites thought about their race the least often and NH Blacks thought about their race the most often. For example, thinking about one's race daily ranged from 7.8% for NH Whites to 40.8% for NH Blacks. The Table also shows how different racial/ethnic groups felt they were treated compared to other racial/ethnic groups over the past year. NH Whites were least likely to think they were treated worse than other racial/ethnic groups and NH Blacks were most likely to think they were treated worse than other racial/ethnic groups. On the other hand, NH Whites were most likely to think they were treated better than other racial/ethnic groups and NH Blacks were least likely to think they were treated better than other racial/ethnic groups. Hispanics were most likely to just encounter people of the same race, but this only involved 0.7%.

Table 1: Summary of Demographic and Behavior Variables.

		No.	%
Age	18-24	15,477	11.1
	25-34	27,775	15.7
	35-44	36,830	16.3
	45-54	42,861	15.4
	55-64	57,917	17.0
	≥65	122,648	24.5
Sex	Men	139,670	46.0
	Women	163,838	54.0
	Race/Ethnicity	241,038	59.9
	Non-Hispanic White	27,061	12.5
	Non-Hispanic Black	19,919	16.5
	Hispanic	15,490	11.1
	Non-Hispanic Other		
Marital Status	Married/Cohabitating	168,023	55.2
	Previously Married	82,209	19.7
	Never Married	50,977	24.2
	Don't know/Refused	22,99	0.9
Education	< High School	16,036	11.7
	High School	73,977	26.7
	Some Coll or Tech Sch	82,016	30.9
	Graduated Coll or Tech Sch	130,398	30.3
	Don't know/Refused	1,081	0.4
Annual Household Income	< $25,000	36,992	12.8
	$25,000 to < $50,000	64,076	20.3
	$50,000 to < $100,000	79,063	23.2
	$100,000 to < $200,000	52,882	17.6
	≥ $200,000	16,748	6.8
	Don't know/Refused/Missing	53,747	19.3
Health Insurance	Yes	279,421	88.8
	No	13,184	6.9
	Don't know/Refused	10,903	4.3
Binge Drinking	Yes	39,798	14.9
	No	258,127	82.5
	Don't know/Refused	55,83	2.5
Heavy Alcohol Drinking	Yes	18,589	5.8
	No	280,012	92.0
	Don't know/Refused	49,07	2.2
Cannabis Use in past month	Yes	12,871	14.4
	No	86,472	84.5
	Don't know/Refused	11,04	1.1
Smoking Status	Current	36,438	12.3
	Former	86,565	24.0
	Never	177,995	62.8
	Don't know/Refused	25,10	0.9
Mental Health	0 days not good	181,470	55.9
	1-13 days not good	75,744	26.7
	14-30 days not good	40,406	15.2
	Don't know/Refused	58,88	2.3
Think about Race	Never	172,815	51.0
	Yearly	24,889	8.4
	Monthly	32,504	11.1
	Weekly	26,700	9.3
	Daily	34,838	15.6
	Don't know/Refused	11,762	4.6
Self-perception of Being Treated Different than People of Other Races	Worse	17,290	8.0
	Same	185,160	62.5
	Better	66,387	18.2
	Worse than some, but better than others	2,535	1.3
	Only with people of the same race	1,593	0.3
	Don't know/Refused	29,805	9.8
	Missing	7,38	

Data Source: BRFSS. Percentages were weighted.

The frequency of thinking about one's race was significantly (Rao Scott Chi-square p <.0001) associated with binge drinking, heavy drinking, cannabis use, and tobacco smoking (Table 3). Odds ratios were used to assess the association between the outcome variables and the frequency of thinking about one's race, adjusted for age, sex, marital status, race, annual household income, education, health insurance, and mental health. The odds of binge drinking, heavy drinking, and cannabis use significantly increase for those who monthly, weekly, or daily think about their race (vs. never). The odds of current smoking vs. former smoking, vs. never smoking only slightly significantly increased for those thinking about their race daily.

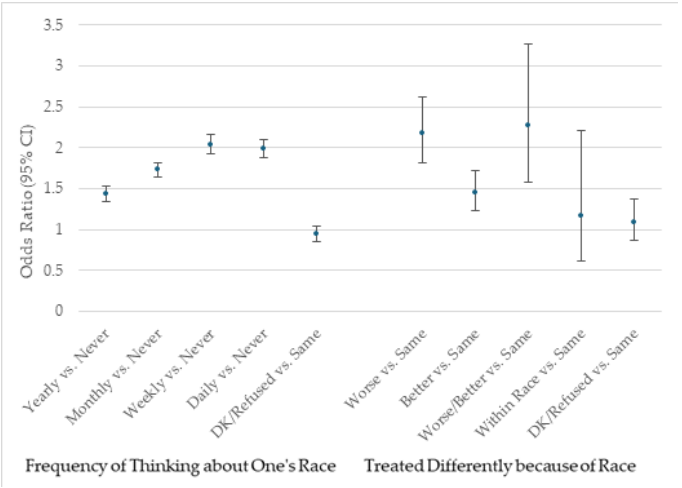

Figure 1: Odds of Days in the Past 30 that Mental Health was Not Good (14-30 vs. 1-13 vs. None) by Frequency of Thinking about Race and Self-perception of Being Treated Differently than People of Other Races. Odds ratios were weighted and adjusted by age, sex, marital status, race, annual household income, education, and health insurance.

Individuals who thought they were treated worse (vs. same) as those in other races were significantly more likely to be binge drinkers, heavy drinkers, cannabis users, and current or former tobacco smokers (Table 4). Those who thought they were treated better (vs. same) as those of other races were significantly more likely to be binge drinkers, heavy drinkers, cannabis users, and current or former tobacco smokers. Those who thought they were treated worse than some races but better than others (vs. same) were significantly more likely to be heavy drinkers, cannabis, and current or former tobacco smokers. The small number who only encountered people of the same race had no significant association with the outcome variables.

Finally, the number of days in the past 30 that mental health was not good (14-30 vs. 1-13 vs. none) significantly increased with frequency thinking about one's race, after adjusting for several demographic variables (Figure 1). The associations were not significantly different among the racial/ethnic groups. In addition, an increasing number of days in the past 30 that mental health was not good significantly increased when people thought they were treated differently (worse or better) than people of other races. Again, the results were not significantly different among the racial/ethnic groups.

Discussion

The current study explored the relationship between frequency of thinking about race and perception of being treated differently than people of other races according to the participants race/ethnicity. NH Whites were half as likely to think about their race as NH Blacks, and that NH Blacks were over five times more likely to think about their race daily than NH Whites. NH Whites were least likely to think they were treated worse than other racial/ethnic groups and most likely to think they were treated better than other racial/ethnic groups. On the other hand, NH Blacks were most likely to think they were treated worse than other racial/ethnic groups and least likely to think they were treated better than other racial/ethnic groups. Hispanics and other racial groups fell in between.

Two hypotheses were assessed. The first hypothesis was that more frequent thought about race was associated with higher odds of binge drinking, heavy alcohol drinking, cannabis use, tobacco smoking, and poor mental health. The second hypothesis was that self-perception of being treated differently than people of other races was associated with higher odds of binge drinking, heavy alcohol drinking, cannabis use, tobacco smoking, and poor mental health.

Hypothesis 1: More Frequent Thought about Race/Ethnicity is Associated with Greater Odds of Binge Drinking, Heavy Alcohol Drinking, Cannabis Use, Tobacco Smoking, and Poor Mental Health

The findings in both Table 3 and Figure 1 confirm this hypothesis for the aspects of binge drinking, heavy drinking, cannabis use, tobacco smoking, and poor mental health. This may be because of the association between perceived racism and frequency of thinking about one's race/ethnicity. Studies have shown that racial discrimination is a potential stressor contributing to binge and heavy alcohol drinking in Black Americans [12-14]. A meta-analysis found that reasons for racial/ethnic disparities in drinking and alcohol use disorders are associated with historical patterns of racial discrimination and persistent socioeconomic disadvantage [15]. A longitudinal family study of alcohol use disorder found that among Black Americans racial and social class discrimination was associated with higher risk of cannabis use [16].

Individuals who thought they were treated worse (vs. same) as those in other races were significantly more likely to be binge drinkers, heavy drinkers, cannabis users, and current or former tobacco smokers (Table 4). Those who thought they

Table 2: Frequency of Thinking about Race and Treatment Compared with Other Races by Race/Ethnicity.

How often do you think about your race?						
	Never	**Yearly**	**Monthly**	**Weekly**	**Daily**	**Rao-Scott Pr > ChiSq**
NH White %	62.3	8.7	11.5	9.6	7.8	<.0001
NH Black %	37.1	5.3	8.0	8.8	40.8	
Hispanic %	42.6	9.9	12.8	8.9	25.9	
Other %	39.1	11.9	15.1	12.4	21.6	
Within the past 12 months, do you feel that in general you were treated worse than, the same as, or better than people of other races?						
	Worse than other races	**The same as other races**	**Better than other races**	**Worse than some, better than others**	**Only encountered people of the same race**	**Rao-Scott Pr > ChiSq**
NH White %	4.0	68.6	26.6	0.5	0.3	<.0001
NH Black %	29.3	61.6	4.4	4.4	0.4	
Hispanic %	9.4	73.4	14.9	1.6	0.7	
Other %	11.8	75.2	10.3	2.6	0.1	

Data Source: BRFSS. Percentages were weighted.

Table 3: Selected Outcomes by Frequency of Thinking about Race.

	Binge Drinking		**Heavy Drinker**		**Cannabis Use in Past Month**		**Tobacco Smoking**	
	%	Odds Ratio (955 CI)	%	Odds Ratio (955 CI)	%	Odds Ratio (955 CI)	Current %	Current vs. Former vs. Never Odds Ratio (95% CI)
Never	13.2	Referent	5.7	Referent	11.6	Referent	14.4	Referent
Yearly	14.1	1.0 (0.9-1.1)	4.8	0.9 (0.8-1.0)	13.5	1.2 (1.0-1.4)	9.4	0.88 (0.82-0.93)
Monthly	18.4	1.2 (1.1-1.3)	6.4	1.1 (1.0-1.3)	17.4	1.6 (1.4-1.7)	8.6	0.91 (0.87-0.96)
Weekly	21.1	1.4 (1.3-1.5)	7.7	1.3 (1.1-1.4)	20.3	1.9 (1.7-2.1)	9.0	1.01 (0.95-1.08)
Daily	18.4	1.5 (1.3-1.6)	6.3	1.3 (1.2-1.5)	21.5	2.1 (1.9-2.4)	12.7	1.08 (1.02-1.15)
Unknown	11.6	1.1 (0.9-1.2)	4.6	1.0 (0.8-1.3)	10.3	1.1 (0.9-1.4)	11.9	0.95 (0.87-1.04)

Data Source: BRFSS. Percentages and odds ratios were weighted. Odds ratios were adjusted for age, sex, marital status, race/ethnicity, annual household income, education, and health insurance.

were treated better (vs. same) as those of other races were significantly more likely to be binge drinkers, heavy drinkers, cannabis users, and current or former tobacco smokers. Those who thought they were treated worse than some races but better than others (vs. same) were significantly more likely to be heavy drinkers, cannabis, and current or former tobacco smokers. The small number who only encountered people of the same race had no significant association with the outcome variables.

Only thinking about race daily (vs. never/yearly/monthly) had a small significant associated with current tobacco use. Another study found that experiencing racism is associated with higher rates of tobacco use, particularly in racial minorities [17-20].

Daily thinking about one's race had the strongest positive association with cannabis use, which suggests that this may be the most effective perceived approach to cope with a negative mood, increase a positive mood, conform with expectations of peers, and for social facilitation [21].

An increasing number of poor mental health days was positively associated with more frequent thinking about one's race. In many cases, experiencing racism and discrimination can lead individuals to think more about their racial identity. Research has shown that perceived racism is associated with racial trauma, chronic stress, erosion of self-worth, maladaptive coping strategies, and depression [22-26].

Hypothesis 2: Self-perception of Being Treated Differently than People of Other Races in the past 12 months is Associated with Greater Odds of Binge Drinking, Heavy Alcohol Drinking, Cannabis Use, Tobacco Smoking, and Poor Mental Health

This hypothesis is confirmed by the results in Table 4 and Figure 1. Individuals who reported being treated worse than people of other races had significantly higher odds of binge drinking, heavy drinking, cannabis use, tobacco smoking, or poor mental health compared to those who reported no difference. These findings support what has previously been studied about how racism-related experiences can be a risk factor for substance use among minority adolescents, emerging adults, and adults [12-20,27].

Individuals who reported being treated better than people of other races also had significantly higher odds of binge drinking, heavy drinking, cannabis use, tobacco smoking, and poor mental health. Feeling you are treated better because of your race is not simply the absence of experiencing racial prejudice, but it is experiencing and acknowledging one's racial privilege. It is also possible that people who perceive racial privilege may engage in more social or recreational substance use or may simply have greater access to substances [21]. Interestingly, those who thought they were treated better had the highest annual household income level. For example, the percentage with an annual household income of at least $100,000 was 20.2% for treated worse, 22.6% for treated same, 32.5% for treated better, 25.7% for treated worse/better, and 13.5% for only encountered people of the same race (Rao-Scott p <.0001).

Those who reported being treated worse than some races, but better than others had higher odds for all the outcome variables except binge drinking. These nuanced findings suggest that both perceived disadvantage and perceived advantage may influence behavior, though likely through different pathways. It is perhaps impossible to understand the results associated with this measure and it would have been better not to have included this option. Note that only 1.3% of the participants chose this response.

Those who only interacted with people of the same race did not have significantly different odds of experiencing the substance and mental health outcomes. This is consistent with their not having feelings of racism or racial superiority.

Limitations

BRFSS data are cross-sectional. Hence, causal relationships between variables cannot be established. Second, different geographic areas participated in the race perception questions. Nevertheless, nearly half the U.S. states and the District of Columbia participated. Third, self-reported responses may be prone to social desirability bias. However, BRFSS is an anonymous survey, which should minimize this potential bias. Fourth, BRFSS does not provide information about whether cannabis use was cannabidiol or THC. Fifth, there is an element of under coverage. The survey was extended by telephone, and there are people that cannot be reached in this form of

Table 4: Binge Drinking, Heavy Alcohol Drinking, Cannabis Use, and Current Tobacco Smoking by Self-perception of Being Treated Different than People of Other Races.

	Binge Drinking		Heavy Drinking		Cannabis Use in Past 30 Days		Tobacco Smoking	
	%	Odds Ratio (95% CI)	%	Odds Ratio (95% CI)	%	Odds Ratio (95% CI)	%	Current vs. Former vs. Never Odds Ratio (95% CI)
Worse than other races	18.8	1. 4 (1.3-1.5)	7.6	1.7 (1.4-1.9)	18.5	1.3 (1.1-1.5)	18.4	1.40 (1.30-1.51)
The same as other races	14.5	Referent	5.3	Referent	13.1	Referent	13.0	Referent
Better than other races	19.0	1.3 (1.2-1.4)	7.8	1.4 (1.3-1.5)	19.4	1.9 (1.7-2.0)	19.2	1.04 (1.00-1.09)
Worse than some races, better than others	16.0	1.1 (0.9-1.4)	7.7	1.7 (1.2-2.5)	18.4	1.4 (1.1-1.9)	18.0	1.25 (1.07-1.45)
Only with people of the same race	10.8	0.8 (0.6-1.2)	5.7	1.2 (0.7-2.1)	12.6	1.1 (0.7-1.9)	12.4	0.85 (0.62-1.17)
Unknown	10.8	0.9 (0.8-1.0)	4.8	1.0 (0.9-1.1)	10.9	1.0 (0.8-1.1)	10.6	1.06 (1.00-1.13)

Data Source: BRFSS. Percentages and odds ratios were weighted. Odds ratios were adjusted for age, sex, marital status, annual household income, education, and health insurance.

communication or do not answer unknown phone numbers. Finally, the variable provided by BRFSS measuring self-perception of being treated differently than people of other races would benefit by eliminating the option "worse than some races, but better than others."

Conclusions

The associations identified between race-related perceptions and substance use and poor mental health suggest that individuals internalize and interpret their racial experiences in a way that can shape their health choices. Frequent thoughts of race correlate with increased substance use and poor mental health and may reflect the mental load carried by individuals dealing with prejudice, discrimination or antagonism. This cognitive and emotional strain, particularly among racial minorities, likely contributes to stress-related coping mechanisms such as cannabis or alcohol use. Surprisingly, even those who perceived themselves as treated better than people of other races showed higher odds of substance use and poor mental health. This pattern may reflect dynamics of social advantage—where privilege, access, or cultural norms around leisure and substance use play a role—rather than protective effects. Current tobacco smoking's weaker link to these perceptions suggests that alcohol drinking and cannabis use may be more reactive to perceived social positioning, while tobacco smoking likely involves longer-term, multifactorial determinants. These outcomes point to the complex role of racial identity in shaping health behaviors—not merely through external experiences of inequality, but also through internalized narratives, coping strategies, and the psychological meanings attached to privilege or marginalization. Approaches to decrease substance use among different racial/ethnic groups must therefore address not only structural inequities, but also the lived reality of how race is felt, processed, and responded to in daily life.

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