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Perceived racial discrimination and polysubstance use among African American and Afro-Caribbean adults: Results from the National Survey of American Life

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Abstract

This study examined the relationship between perceived racial discrimination (PRD) and patterns of substance use. Data come from the 2001-2003 National Survey of American Life (N=3,589). PRD was derived from the Major Experiences of Discrimination Scale. Multinomial logistic regression estimated the relationship between PRD and patterns of substance use (i.e., never, single-substance, dual-substance, and polysubstance (3+ substances)) based on six substances; effect modification by ethnicity and sex was assessed by stratification. Study findings indicate that PRD was associated with greater odds of lifetime and current polysubstance use. Results from the effect modification analyses suggested differential associations by ethnicity and sex.

Keywords

Polysubstance use; discrimination; race; ethnicity; minority health

Introduction

Approximately 90% of US Black adults who report experiencing discrimination in their lifetimes attribute race/ethnicity as the primary reason (Kessler, Mickelson, & Williams, 1999). Recently, there has been increasing attention to the ways in which race-salient exposures, such as perceived racial discrimination (PRD), relate to the mental health of minorities in the US (T. T. Clark, 2014; T. T. Clark, Salas-Wright, Vaughn, & Whitfield, 2015; Hunte and Barry, 2012; Kessler, et al., 1999; Soto, Dawson-Andoh, & BeLue, 2011). While a large body of research has documented associations between PRD and related exposures with symptoms of depression (T. T. Clark, 2014; Kessler, et al., 1999) and anxiety (Kessler, et al., 1999; Soto, et al., 2011) among Black Americans, the links between PRD and externalizing behaviors such as substance use and misuse are less clear.

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Disclosure statement

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Polysubstance, also known as polydrug use, is defined as the concurrent use of more than one non-prescribed psychoactive substance (Connor, Gullo, White, & Kelly, 2014; Smith, Farrell, Bunting, Houston, & Shevlin, 2011), and is associated with psychiatric comorbidity and other poor health outcomes, including elevated risk of accidental overdose (Connor, et al., 2014; Salom, Betts, Williams, Najman, & Alati, 2016; Schneider, Park, Allen, Weir, & Sherman, 2019; Smith, et al., 2011). Recent investigations have explored the prevalence, predictors, and patterning of polysubstance use in adult (Evans, Grella, Washington, & Upchurch, 2017; Salom, et al., 2016; Schneider, et al., 2019; Smith, et al., 2011) and youth (Chung, Kim, Hipwell, & Stepp, 2013; Moss, Chen, & Yi, 2014; Silveira, Green, Iannaccone, Kimmel, & Conway, 2019; Tomczyk, Isensee, & Hanewinkel, 2016) populations. Existing evidence suggests that PRD is associated with increased risk of substance use and substance use disorders (Assari, Mistry, & Caldwell, 2018; Assari, Mistry, Lee, Caldwell, & Zimmerman, 2019; Borrell et al., 2010; Borrell et al., 2007; Borrell, Kiefe, Diez-Roux, Williams, & Gordon-Larsen, 2013; T. T. Clark, 2014; T. T. Clark, et al., 2015; Hunte and Barry, 2012; Rose et al., 2018), such as the use of alcohol (Borrell, et al., 2010; Borrell, et al., 2007; Borrell, et al., 2013; Rose, et al., 2018), tobacco (Assari, et al., 2018; Borrell, et al., 2010; Borrell, et al., 2007; Borrell, et al., 2013; Rose, et al., 2018), and marijuana (Assari, et al., 2019; Borrell, et al., 2007; Rose, et al., 2018). However, investigation on the relationship between PRD and patterns of substance use, including polysubstance use, among adult samples is limited.

Attempts to understand how exposures like PRD relate to substance use behaviors requires nuanced consideration of how race intersects with sex and other identities. Intersectionality frameworks derived from feminist and critical race theories postulate that variations in social advantages or disadvantages originate from multiple categories of identities, including race, ethnicity, sex, and gender (Cole, 2009; Shields, 2008). That is, when examining the relationship between race and substance use, for example, sex is not simply a variable to adjust for in multivariable analysis; rather, understanding sex differences is an objective of substantive scientific interest. Consistent with this notion, several studies have reported that polysubstance use and subsequent polysubstance-related disorders vary by race/ethnicity and sex/gender (Chung, et al., 2013; Evans, et al., 2017; Moss, et al., 2014; Salom, et al., 2016; Silveira, et al., 2019; Tomczyk, et al., 2016). For example, a recent study using the National Longitudinal Study of Adolescent to Adult Health reported that polysubstance use was associated with substance use disorders in young adulthood, and that this relationship was stronger among adolescent males compared to females (Moss, et al., 2014). Another study explored the influence of ethnicity among US Black women, finding that African American women have higher prevalence of substance use disorders compared to Afro-Caribbean women (Broman, Neighbors, Delva, Torres, & Jackson, 2008).

There are several proposed processes underlying these racial/ethnic and sex differences in substance use disorders, including perceived social and cultural consequences of substance use (Mulia, Ye, Greenfield, & Zemore, 2009; Unger et al., 2002), substance preferences (Wu, Zhu, & Swartz, 2016), and self-regulatory stress coping behaviors (R. Clark, Anderson, Clark, & Williams, 1999; Gerrard et al., 2012). For example, males who experienced discrimination are more likely to externalize behaviors and use substances compared to females (Assari, et al., 2018; Brody, Kogan, & Chen, 2012), while females are more

likely to experience other behaviors such as binge eating (Assari, 2018) and exercising more frequently (Brodish et al., 2011) in response to these stressors. Variation in coping behaviors by race/ethnicity also exist. For example, discrimination is associated with alcohol use among Hispanics and tobacco use among non-Hispanic (NH) Whites, while both alcohol and tobacco consumption are associated with discrimination among NH Blacks (Borrell, et al., 2010). Findings indicating that generalized anxiety disorder is associated with discrimination in African Americans but not Afro-Caribbeans and NH Whites suggest possible differential effects of internalizing behaviors by race/ethnicity (Soto, et al., 2011).

To date there has been limited research exploring the relationship between PRD and patterns of substance use, including how ethnicity and sex shape this relationship, within the US Black adult population. Three prior studies on this topic all reported that discrimination was associated with greater substance use outcomes among Black adults (T. T. Clark, 2014; T. T. Clark, et al., 2015; Hunte and Barry, 2012), and one reported that this relationship was primarily mediated by depression for Afro-Caribbean but not African American young adults (T. T. Clark, 2014). These studies helped illustrate the importance of discrimination to substance use outcomes and can be built upon to further understand the patterns in specific ways. For example, none of the previous studies examined the role of *attribution* (i.e., perception of the primary reason respondents felt they were discriminated against) as an exposure; rather, they evaluated the overall effect of *any form* of discrimination (i.e., irrespective of attribution). As illustrated by the intersectionality framework, the salience of race, ethnicity, sex, and gender may shape how discriminatory experiences are perceived and evaluated (Bowleg, 2012). However, these studies did not evaluate the relationship between discrimination and patterns of substance use or of polysubstance use specifically as an outcome, instead examining individual substances separately or substance use disorders. In addition, the US Black population is heterogeneous in terms of ethnic identity, birthplace, and other sociocultural norms, and these factors may play a role in the manner people experience, perceive, and attribute racial discrimination, as well as the links between PRD and behaviors like patterns of substance use (Georgiades, Boyle, & Duku, 2007).

The present study builds on prior work by examining heterogeneity within the Black population for the relationship between PRD and patterns of lifetime and current substance use, including polysubstance use, in a large, nationally representative sample of US Black adults. In addition, we examined the extent to which the relationship between PRD and patterns of substance use differed by ethnicity, by sex, and by ethnicity and sex, using intersectionality frameworks that call attention to the sources of variation within groups.

Material and Methods

Data

The National Survey of American Life (NSAL) is a nationally representative, cross-sectional study from the National Institute of Mental Health Collaborative Psychiatric Epidemiology Surveys Initiative (Heeringa et al., 2004; Jackson et al., 2004). The NSAL, conducted between February 2001 and June 2003, investigated the mental health status of native (African American) and Caribbean foreign-born (Afro-Caribbean) Blacks in the US (Jackson, Torres, et al., 2004). The study employed a national multi-stage probability

sampling strategy and participants were matched on race/ethnicity to interviewers for face-to-face interviews (Jackson, Neighbors, Nesse, Trierweiler, & Torres, 2004). The NSAL was approved by the University of Michigan Institutional Review Board; this analysis used publicly available data from the Inter-university Consortium for Political and Social Research (Alegria, Jackson, Kessler, & Takeuchi, 2016).

Participants

The NSAL sample was comprised of NH White (n=891), Hispanic (n=183) African American (n=3,570) and Afro-Caribbean (US-born and foreign-born, n=1,438) adults (Jackson, Neighbors, et al., 2004). The present study excluded NH White and Hispanic participants (n=1,074) and participants missing data for the Major Experiences of Discrimination Scale (MEDS) (n=641) or substance use, including use of cigarettes, alcohol, marijuana, cocaine, prescription drugs, and other drugs (n=759). Participants missing information on their age at immigration were also excluded (n=19). The final analytic sample consisted of 3,589 participants.

Measures

Perceived Racial Discrimination.—PRD was measured using the 9-item Major Experiences of Discrimination Scale (MEDS) (Williams et al., 2008). The scale assessed lifetime exposures of ways in which participants were treated or how participants perceived being treated by others in nine scenarios (Williams, et al., 2008) (see Supplementary Table 1). If participants responded “yes” to any of the items on the scale, they were prompted to indicate the main reason why they believed the event occurred (i.e., ancestry or national origins, gender, race, age, religion, height, weight, some other aspect of physical appearance, sexual orientation, education or income level). The PRD index aggregated the nine experiences of unfair treatment into a three-category variable, focused on racial attribution. The categories were: none of the nine experiences (i.e., participants who indicated experiencing none of the nine events or participants who did experience at least one event but did not indicate race as one of the attributions), at least one event experienced and attributed to race, and two or more events experienced and attributed to race. These categories were chosen to emphasize differences in not only experiencing unfair treatment and attributing it to race, but to also isolate differences between PRD originating from multiple unique instances, compared to PRD derived from one instance, and discrimination not attributed to race or no experience of discrimination at all. The Cronbach’s alpha internal reliability score of the nine variables used to contextualize scenarios of racial/ethnic discrimination was 0.64.

Patterns of Substance Use.—Participants were asked about lifetime (ever) or current use of the following substances: cigarettes, alcohol, marijuana, cocaine, prescription drugs, and other drugs in the NSAL. This study includes two primary outcomes: lifetime substance use and current substance use.

For lifetime cigarette use, participants answered if they had smoked more than 100 cigarettes in their lifetime, and if they answered “yes”, then they were considered lifetime cigarette users. Because NSAL did not include an “ever” alcohol use variable, participants who ever

drank twelve drinks in a year were considered lifetime alcohol users. Participants were asked if they had used marijuana or prescription drugs without recommendation from a health professional, and those who indicated “yes” were considered lifetime users of that respective substance. In addition, participants were asked if they had ever used cocaine or other drugs even once. Questions about participants’ use of prescription drugs, including tranquilizers, stimulants, pain killers, or other drugs, referred to unhealthy use (i.e., use either without recommendation from a health professional or for any reason other than what a health professional advised to use them for). Use of other drugs included heroin, opium, glue, LSD, peyote, or any other drug.

Current use of cigarettes was defined as participants who indicated that they “currently” smoked. Current use of the remaining substances was defined using past-year criteria. For alcohol use, participants who indicated that they drank nearly every day, 3-4 days per week, 1-2 days per week, 1-3 days per month, and less than once a month in the past year were defined as current users. For marijuana, cocaine, prescription drug, and other drug use, current users were defined as participants who responded “yes” to use in the past year.

Two patterns-of-substance use variables were created by categorizing participants into the following mutually exclusive use groups: never used any substance, single-substance users, dual-substance users, and polysubstance users, based on the possible combinations of use among the six substances for both lifetime use and current use, respectively. Dual-substance use indicated use of any combination of two substances, and polysubstance use indicated use of any combination of three or more substances.

Covariates.—Age, immigration status, sex, ethnicity, education, and household income were included in this analysis as potential confounders. Immigration status was categorized into a three-level variable consisting of: US born, aged less than 18 years old at migration, and aged 18 years or older at migration. Participants reported their sex as either male or female, and ethnicity as either African American or Afro-Caribbean. Education was categorized into less than high school, high school graduate, some college, and college or more, whereas household income was operationalized into four groups: less than $30,000, $30,000-$49,999, $50,000-$74,999, and more than $75,000 per year and in US dollars.

Statistical Analysis

Weighted frequencies and percentages of categorical variables and means and standard deviations of continuous variables were compared across the substance use groups. Chi-square and ANOVA tests were computed to evaluate bivariate differences between the four substance use patterns (never, single-substance, dual-substance, polysubstance use). Logistic regression models were computed to obtain odds ratios and 95% confidence intervals for the relationships between the independent variable, PRD (referent: none of the nine experiences), and the dependent variables, lifetime substance use (referent: never) and current substance use (referent: never/ever), of each individual substance and patterns-of use-variable, adjusted for age, sex, ethnicity, education, and household income. Two adjusted multivariable multinomial logistic regression models were used to examine associations between PRD and lifetime patterns of substance use, and PRD and current

patterns of substance use, with reporting none of the nine racial experiences as the exposure referent group and never users as the outcome referent group. A two-way interaction for PRD and ethnicity, a two-way interaction for PRD and sex, and a three-way interaction for PRD, ethnicity, and sex were tested in a single model to investigate if associations between PRD and lifetime substance use differed across levels of ethnicity (African American v. Afro-Caribbean), sex (female v. male), and ethnicity and sex (African American female v. African American male v. Afro-Caribbean female v. Afro-Caribbean male), respectively. For analyses involving current patterns of substance use, dual-substance and poly-substance use groups were collapsed. Analyses were stratified by ethnicity, by sex, and by ethnicity and sex for both lifetime and current patterns of substance use to assess effect modification, recognizing that we may have been underpowered to tests three-way interactions, and to explore differences within these subgroups. The Benjamini-Hochberg (false discovery rate) procedure was used to correct for multiple testing by adjusting associated stratum-specific p-values in effect modification analyses (Benjamini & Hochberg, 1995). Sensitivity analyses excluding participants who drank less than once a month in the past year were were robust when using this more conservative measure with respect to alcohol consumption. All associations were examined accounting for the complex survey design by adjusting for primary sampling units, strata, and survey weights. Data were analyzed using Stata, version 15.1 (StataCorp).

Results

Participant Characteristics

The distribution of participants by each MEDS item and the PRD index is shown in Supplementary Table 1. Over half of the sample (58.0%) indicated that they either had not experienced any of the nine events of the MEDS, or if they had, they did not attribute any of the events to race. Table 1 describes the weighted distributions of descriptive characteristics overall and by the PRD Index. One-fourth of the sample were lifetime single-substance users, 28% were lifetime dual-substance users, and 31% were lifetime polysubstance users. Nearly 39% were current single-substance users, 19% were current dual-substance users, and 7% were current polysubstance users. Nearly half of the respondents who attributed at least two discriminatory events to race were lifetime polysubstance users; however, only 12.4% of these respondents were current polysubstance users.

Perceived Racial Discrimination and Patterns of Substance Use

Table 2 shows results from the adjusted models examining the relationship between PRD and lifetime use of individual substances (separate logistic regression models) and patterns of substance use (multinomial regression model). Two or more PRD experiences was associated with higher odds of lifetime use of each substance. These associations were strongest for illicit drugs such as use of cocaine (Odds Ratio (OR): 2.35; 95% CI: 1.71, 3.21) and other drugs (OR: 3.10; 95% CI: 1.92, 5.01). The weakest association was between PRD and alcohol use (OR: 1.38; 95% CI: 1.11, 1.72). Although some associations between PRD and substance use were not statistically significant, findings were consistent with a dose-response relationship looking across single-, dual-, and polysubstance use. Compared

to participants who reported experiencing no PRD, participants who attributed at least two experiences of PRD had nearly four times greater odds of being lifetime polysubstance use.

PRD was associated with higher odds of current marijuana use, but associations involving the other five substances were null (see Table 3). For marijuana, two or more PRD experiences was associated with nearly 2.5 times higher odds of current marijuana use (OR: 2.46; 95% CI: 1.61, 3.75), compared to those who did not report PRD. The dose-response relationship found in associations of lifetime substance use was also found in associations of current substance use. Particularly, PRD was associated with current dual- and polysubstance use. This association was strongest for those who attributed at least two experiences of PRD, compared to those who did not report PRD, and polysubstance use (OR: 4.87; 95% CI: 3.11, 7.64).

Sensitivity analyses excluding participants who drank less than once a month in the past year from the definition of current alcohol use showed that the distribution of patterns of substance use by PRD did not statistically significantly change. The associations between current patterns of substance use and PRD were attenuated toward the null for single-, dual-, and polysubstance use, but these shifts in magnitude of associations were minimal.

Effect Modification by Ethnicity and Sex

Tables 4 and 5 display the relationship between PRD and patterns of substance use by ethnicity and sex for lifetime and current use, respectively. Among African Americans, those who reported one PRD experience had nearly two times greater odds of polysubstance use and those who reported at least two PRD experiences had nearly four times greater odds of lifetime polysubstance use (OR: 3.92; 95% CI: 2.32, 6.61), compared to those who did not report PRD. Among Afro-Caribbeans, participants who reported at least two PRD experiences had 3.8 times greater odds of lifetime dual-substance use (95% CI: 1.48, 9.62) and, although only marginally significant, 2.2 times greater odds of lifetime polysubstance use (95% CI: 0.88, 5.29), relative to those who did not report PRD. Associations between PRD and current patterns of substance use were similar to associations involving lifetime patterns of substance use. For example, African Americans who experienced any PRD had greater odds of current dual-/polysubstance use, compared to African Americans who did not report PRD.

PRD was positively associated with polysubstance use among both sexes. Among women, those who reported one PRD experience had nearly two times greater odds of lifetime polysubstance use, and those who reported two or more PRD experiences had 3.7 times greater odds (95% CI: 2.08, 6.40) of lifetime polysubstance use, compared to women who did not report PRD. The point estimate for the relationship between the highest level of PRD and lifetime polysubstance use in men was stronger (OR: 4.56; 95% CI: 1.94, 10.69), but less precise, than that for women. Although weaker in magnitude, results stratified by sex for current patterns of substance use were also similar to associations for lifetime patterns of substance use. For example, both females and males who reported at least two PRD experiences had nearly two to three times higher odds of dual-/polysubstance use than females and males who did not report PRD.

Intersection by ethnicity and sex.—African American women who reported one PRD experience had two times greater odds of polysubstance use compared to those who did not report PRD. Among African American men, those who attributed at least two experiences of discrimination to race had nearly 4.7 times greater odds of polysubstance use (95% CI: 1.92, 11.68), compared to those who did not report racial discrimination. For current patterns of substance use, associations were similar with the exception of dual-/polysubstance use in African American males, which was associated with respondents who reported one PRD experience (OR: 1.78; 95% CI: 1.04, 3.03), compared to African American males who did not report PRD.

Among Afro-Caribbean women, those who reported one PRD experience had higher odds of polysubstance use (OR: 2.42; 95% CI: 0.80, 7.38), but this association was not statistically significant. Further, although not statistically significant after false discovery rate correction, Afro-Caribbean women who reported at least two PRD experiences had 3.4 times greater odds of dual-substance use (95% CI: 1.03, 11.35), compared to Afro-Caribbean females who did not report PRD. For current use, Afro-Caribbean women who reported at least two PRD experiences had 3.4 times higher odds of current single-product use (95% CI: 1.15, 9.79), compared to Afro-Caribbean females who did not report PRD, but this association was no longer statistically significant after false discovery rate correction. For Afro-Caribbean females, associations including dual-/polysubstance use were not statistically significant. Furthermore, PRD was not associated with lifetime or current substance use outcomes among Afro-Caribbean men, although most of the point estimates were in the direction of increased risk of use.

Discussion

Using a large, nationally representative sample, we found that PRD is a common experience for Black Americans adults and that this experience is associated with patterns of substance use. Nearly four in 10 US Black adults reported at least one PRD experience in their lifetime. Lifetime patterns of substance use were also common, with nearly one-quarter of participants engaging in either dual-substance (26.9%) or polysubstance (26.6%) use. While prevalence of current dual patterns of substance use was similar to lifetime prevalence (24.2% v. 22.8%), current polysubstance use was lower than lifetime prevalence (12.4% v. 49.0%). Participants who experienced PRD had higher odds of both individual substance and lifetime polysubstance use than those who did not experience PRD. PRD was only associated with current marijuana use, but associations between PRD and current patterns of substance use suggested that PRD is related to the use of multiple substances. Overall, these findings illustrate the salience of PRD for substance use outcomes in the US Black population.

Our results are consistent with the handful of prior investigations of PRD and substance use (Assari, et al., 2018; Assari, et al., 2019; Borrell, et al., 2010; Borrell, et al., 2007; Borrell, et al., 2013; T. T. Clark, 2014; Rose, et al., 2018). For example, an analysis using the Coronary Artery Risk Development in Young Adults study operationalized PRD in a similar manner to this study and reported that PRD was related to use of tobacco, alcohol, marijuana, and cocaine (Borrell, et al., 2007). Another study reported that lifetime PRD was associated with

higher odds of past-month cigarette use, harmful alcohol use, and past-month marijuana use among young adults (Rose, et al., 2018). Together, these studies indicate a need for further research to investigate how PRD contributes to patterns of substance use such as explicit distinctions among types of substances used within dual-substance and polysubstance use subgroups.

This study employed an intersectionality framework to explore how sex and ethnicity relate to PRD and patterns of substance use. To our knowledge, this is one of the first studies to evaluate the impact of PRD on patterns of substance use, including polysubstance use, with attention to variation by ethnicity and sex within the US Black population. Our analyses showed that the substantive relationship between PRD and lifetime and current substance use differed for African American and Afro-Caribbean adults; for both groups, reporting two or more PRD experiences was associated with higher odds of substance use. For lifetime use, these relationships were more pronounced for dual-substance use among Afro-Caribbeans as compared to polysubstance use among African Americans. In terms of gender, PRD was related to lifetime polysubstance use among both males and females in a dose-response manner, with point estimates that may be stronger among men than women. Associations were weaker in magnitude for current patterns of substance use but suggest that PRD is related to recent use of multiple substances among African Americans, females, and males.

Analyses stratified by ethnicity and sex illustrated that the association between PRD and polysubstance use may be stronger among Afro-Caribbean women relative to Afro-Caribbean men. Although not statistically significant, Afro-Caribbean women who reported at least two PRD experiences had over four times higher odds of being lifetime polysubstance users compared to those who did not report PRD. While PRD was associated with polysubstance use among African American men, findings among Afro-Caribbean men were not statistically significant. The lack of statistically significant findings among Afro-Caribbeans may reflect limitations of sample size and lower statistical power. Overall, our findings contrast with prior studies suggesting that discrimination is a stronger risk factor for substance use among men as compared to women (Assari, et al., 2018; Assari, et al., 2019; Brody, et al., 2012). This was corroborated by the results involving current use where Afro-Caribbean females who reported at least two PRD experiences had over three times higher odds of single-product use, while associations involving Afro-Caribbean males were null. While our results stratified by sex bolster the argument that PRD is related to substance use in both men and women similarly, results by ethnicity and sex highlight that more detailed consideration of intersectional experiences is needed to understand the relationships between PRD and substance use within the US Black population.

Our findings imply that more frequent exposure to racially attributed discrimination is associated with polysubstance use, and these associations vary by ethnicity and sex. While the mechanisms underlying this relationship are still unclear, the stress-process model, which posits that stressors prompt engagement in risky health behaviors, such as substance use, as self-regulatory coping efforts (Ong, Fuller-Rowell, & Burrow, 2009; Pearlin, Lieberman, Menaghan, & Mullan, 1981) may provide a useful framework for understanding our results. Pervasive social stressors, such as PRD, may influence engagement in risky

health behaviors as a means to regulate the stress response, a relationship that may change over the life course (R. Clark, et al., 1999). While the mechanisms linking PRD to substance use are still unresolved, there is suggestive evidence that anger (Gibbons et al., 2010), reduced self-control (Gibbons, et al., 2010; Gibbons et al., 2012), and changes in externalizing behaviors, such as onset of problematic alcohol use (Gibbons et al., 2014), may play a role. Our results indicating that PRD and polysubstance use differ by ethnicity and sex supports the underlying linkage explained by intersectionality theory. Future research should continue to employ these frameworks in identifying mechanisms connecting race-salient exposures to health.

Limitations

Findings should be interpreted in light of study limitations. First, the cross-sectional nature of the NSAL precludes our ability to infer temporal relationships between the exposure and outcomes. Substance use generally first emerges in adolescence, and thus PRD may have occurred contemporaneous with, or subsequent to, the patterns of substance use. Second, our goal was to explore the role of racial attribution of discriminatory experiences; as a result, participants who attributed all discrimination to reasons *other than race* (20.1%) were combined with participants who reported they had *never experienced* discrimination for any reason (37.9%) in this analysis. Participants who reported never experiencing any form of discrimination and participants who reported experiencing discrimination but who attributed it to reasons other than race may systematically differ in respect to substance use and other covariates. This limitation warrants further research in exploring the various attribution types and their relationships with substance use, especially within ethnically diverse samples. Third, we operationalized PRD as no PRD experiences, one out of nine PRD experiences, and at least two out of nine PRD experiences rather than treating PRD as a count variable. Our motivation was to emphasize the extent to which more PRD was associated with polysubstance use while maintaining adequate sample sizes in ethnicity-by-sex strata. However, we acknowledge that categorizing PRD has the potential to lose important information (Cohen, 1983). For example, participants who experience racial/ethnic discrimination in all nine scenarios might differ in their substance use behaviors from participants who experience it in two scenarios. Finally, NSAL was conducted between 2001 and 2003, which pre-dated recreational marijuana use legalization in several states (Cerdá et al., 2020; Yu, Chen, Chen, Yan, 2020). Thus, in our study, marijuana use was characterized as an illicit substance. Today, legislation and associated de-stigmatization of marijuana use has potentially led to an increase in use among youth and adults (Cerdá et al., 2020; Yu, Chen, Chen, Yan, 2020). Additionally, misuse of prescription drugs is more prevalent today than it was when these data were collected (Scholl, Seth, Kariisa, Wilson, & Baldwin, 2018). Despite these limitations, the NSAL is the only nationally representative sample of Black Americans that contains information on both discrimination and substance use, and thus it provides the richest source of data for examining variation within the Black population.

Further research is necessary in order to identify mechanisms linking PRD and substance use, including exploration of the similarities and differences of these processes across social and cultural characteristics. Public health professionals should consider the impact of PRD on patterns of substance use, including polysubstance use. Interventions to address

polysubstance use in minority populations may benefit from acknowledging exposures that are disproportionately experienced by these minorities, including PRD.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Data availability statement:

The data that support the findings of this study are openly available in the Inter-university Consortium for Political and Social Research at https://doi.org/10.3886/ICPSR20240.v8.

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Table 1.

Descriptive Characteristics of African American and Afro-Caribbean Adults by Prevalence of PRD: The National Survey of American Life (NSAL), 2001-2003 (*N*=3,589)

		PRD Index[a]			
Descriptive Characteristics	**Total (*N*=3,589)**	**No experiences (*n*=2,184)**	**One Experience (*n*=742)**	**At least two experiences (*n*=663)**	**P-value[b]**
Age ± SD	41.5 ± 0.5	41.0 ± 0.6	41.2 ± 0.8	43.5 ± 0.7	0.058
Immigration status, *n* (%)					0.091
US born	2880 (94.3)	1706 (93.6)	603 (95.1)	571 (95.4)	
<18 years old at migration	249 (1.8)	155 (1.6)	49 (2.3)	45 (2.0)	
18+ years old at migration	460 (3.9)	323 (4.8)	90 (2.6)	47 (2.6)	
Sex, *n* (%)					*<0.001*
Female	2220 (53.8)	657 (37.9)	336 (50.1)	376 (65.4)	
Male	1369 (46.2)	1527 (62.1)	406 (49.9)	287 (34.6)	
Ethnicity, *n* (%)					0.760
African American	2637 (94.3)	1602 (94.1)	538 (94.2)	497 (94.9)	
Afro-Caribbean[c]	952 (5.7)	582 (5.9)	204 (5.8)	166 (5.1)	
Education, *n* (%)					*<0.001*
Less than high school	783 (22.6)	535 (25.6)	136 (18.4)	112 (18.2)	
High school graduate	1301 (37.5)	825 (40.0)	277 (36.6)	199 (31.5)	
Some college	891 (24.8)	512 (22.5)	187 (26.9)	192 (29.3)	
College or more	614 (15.1)	312 (11.9)	142 (18.1)	160 (21.0)	
Household income, *n* (%)					*<0.001*
<$30,000	1885 (49.3)	1233 (53.0)	360 (46.0)	292 (42.5)	
$30,000-$49,999	867 (24.4)	515 (24.0)	190 (26.5)	162 (23.7)	
$50,000-$74,999	488 (14.7)	254 (12.6)	118 (16.7)	116 (18.6)	
$75,000+	349 (11.5)	182 (10.5)	74 (10.8)	93 (15.2)	
Lifetime substance use, *n* (%)[d]					*<0.001*
Never	698 (16.7)	506 (20.4)	118 (14.1)	74 (9.1)	
Single	971 (25.0)	633 (27.9)	188 (23.1)	150 (19.1)	
Dual	966 (27.7)	579 (28.5)	221 (30.1)	166 (22.8)	
Poly	954 (30.6)	466 (23.3)	215 (32.7)	273 (49.0)	
Current substance use, *n* (%)[d]					*<0.001*
Never/ever	1326 (34.9)	880 (38.8)	260 (33.5)	186 (25.3)	
Single	1412 (38.9)	863 (40.1)	285 (36.5)	264 (38.1)	
Dual	640 (19.3)	346 (16.4)	149 (22.4)	145 (24.2)	
Poly	211 (6.9)	95 (4.7)	48 (7.6)	68 (12.4)	

[a] Number of different experiences of discrimination attributed to race

[b] Chi-square (categorical) or ANOVA tests (continuous) p-values comparing descriptive characteristics by lifetime patterns of substance use

[c] Includes US-born and foreign-born participants

[d] Substance use includes cigarettes, alcohol, marijuana, cocaine, abuse of prescription drugs, and use of other drugs; other drugs include heroin, opium, glue, LSD, peyote, or anything else

Table 2.

Associations between the Racial Discrimination Index and Lifetime Patterns of Substance Use (*N*=3,589)

	Perceived Racial Discrimination Index[a]					
	One of the nine experiences			At least two of the nine experiences		
Substance Use	***n***	**OR[b]**	**95% CI**	***n***	**OR[b]**	**95% CI**
Cigarette						
Never	438	REF		317	REF	
Ever	304	**1.48**	**(1.22, 1.79)**	346	**2.22**	**(1.63, 3.02)**
Alcohol						
Never	205	REF		159	REF	
Ever	537	1.28	(0.95, 1.73)	504	**1.38**	**(1.11, 1.72)**
Marijuana						
Never	355	REF		279	REF	
Ever	387	**1.59**	**(1.32, 1.92)**	384	**2.22**	**(1.66, 2.97)**
Cocaine						
Never	657	REF		540	REF	
Ever	85	**1.47**	**(1.07, 2.01)**	123	**2.35**	**(1.71, 3.21)**
Prescription Drugs						
Never	691	REF		606	REF	
Ever	51	1.39	(0.84, 2.30)	57	**1.76**	**(1.17, 2.64)**
Other Drugs[c]						
Never	707	REF		607	REF	
Ever	35	**1.84**	**(1.14, 2.97)**	56	**3.10**	**(1.92, 5.01)**
Patterns of Substance Use						
Never	118	REF		74	REF	
Single	188	1.17	(0.80, 1.73)	150	1.37	(0.84, 2.24)
Dual	221	1.42	(0.95, 2.10)	166	1.37	(0.86, 2.20)
Poly	215	**1.97**	**(1.43, 2.71)**	273	**3.97**	**(2.42, 6.51)**

Exposure referent group: None of the nine experiences

[a]Number of different experiences of discrimination attributed to race

[b]Estimates are adjusted for age, sex, ethnicity, education, and income

[c]Other drugs include heroin, opium, glue, LSD, peyote, or anything else

Table 3.

Associations between the Racial Discrimination Index and Current Patterns of Substance Use (*N*=3,589)

	Perceived Racial Discrimination Index[a]					
	One of the nine experiences			At least two of the nine experiences		
Substance Use	***n***	**OR[b]**	**95% CI**	***n***	**OR[b]**	**95% CI**
Cigarette						
Never/ever	108	REF		127	REF	
Current	196	1.19	(0.81, 1.73)	219	1.33	(0.96, 1.84)
Alcohol						
Never/ever	131	REF		104	REF	
Current	414	0.87	(0.63, 1.20)	407	1.13	(0.84, 1.51)
Marijuana						
Never/ever	287	REF		272	REF	
Current	100	**1.91**	**(1.28, 2.86)**	112	**2.46**	**(1.61, 3.75)**
Cocaine						
Never/ever	73	REF		113	REF	
Current	12	1.00	(0.42, 2.39)	10	0.64	(0.20, 2.05)
Prescription Drugs						
Never/ever	41	REF		46	REF	
Current	10	1.19	(0.36, 3.98)	11	0.87	(0.22, 3.35)
Other Drugs[c]						
Never/ever	29	REF		47	REF	
Current	6	0.73	(0.14, 3.64)	9	0.82	(0.27, 2.49)
Patterns of Substance Use						
Never	260	REF		186	REF	
Single	285	0.99	(0.76, 1.28)	264	1.29	(0.96, 1.73)
Dual	149	**1.56**	**(1.09, 2.24)**	145	**2.13**	**(1.53, 2.96)**
Poly	48	**2.09**	**(1.35, 3.24)**	68	**4.87**	**(3.11, 7.64)**

Exposure referent group: None of the nine experiences

[a]Number of different experiences of discrimination attributed to race

[b]Estimates are adjusted for age, sex, ethnicity, education, and income

[c]Other drugs include heroin, opium, glue, LSD, peyote, or anything else

Table 4.

Effect Modification by Ethnicity, by Sex, and by Ethnicity and Sex of Associations between the Racial Discrimination Index and Lifetime Substance Use by Ethnicity (*N*=3,589)

	Perceived Racial Discrimination Index[a]					
	One of the nine experiences			At least two of the nine experiences		
Patterns of Substance Use	***n***	**OR**	**95% CI**	***n***	**OR**	**95% CI**
By Ethnicity [b]						
African Americans						
Never	80	REF		49	REF	
Single	123	1.13	(0.74, 1.72)	105	1.31	(0.78, 2.21)
Dual	160	1.38	(0.90, 2.10)	113	1.27	(0.78, 2.08)
Poly	175	**1.95**	**(1.39, 2.73)**	230	**3.92**	**(2.32, 6.61)**
Afro-Caribbeans						
Never	38	REF		25	REF	
Single	65	1.68	(0.99, 2.85)	45	**2.42** [e]	**(1.02, 5.74)**
Dual	61	1.58	(0.80, 3.14)	53	**3.77**	**(1.48, 9.62)**
Poly	40	1.20	(0.56, 2.59)	43	2.16	(0.88, 5.29)
By Sex [c]						
Females						
Never	92	REF		52	REF	
Single	119	1.23	(0.82, 1.83)	83	1.37	(0.80, 2.34)
Dual	93	1.38	(0.93, 2.03)	53	1.13	(0.66, 1.93)
Poly	102	**1.84**	**(1.21, 2.78)**	99	**3.65**	**(2.08, 6.40)**
Males						
Never	26	REF		22	REF	
Single	69	1.12	(0.45, 2.77)	67	1.46	(0.62, 3.42)
Dual	128	1.44	(0.57, 3.66)	113	1.64	(0.68, 3.94)
Poly	113	2.08	(0.90, 4.84)	174	**4.56**	**(1.94, 10.69)**
By Ethnicity and Sex [d]						
African American Females						
Never	63	REF		35	REF	
Single	83	1.20	(0.78, 1.85)	60	1.31	(0.74, 2.33)
Dual	80	1.38	(0.92, 2.06)	37	1.05	(0.60, 1.84)
Poly	90	**1.78**	**(1.15, 2.76)**	81	**3.49**	**(1.94, 6.29)**
African American Males						
Never	17	REF		14	REF	
Single	40	1.07	(0.40, 2.84)	45	1.43	(0.58, 3.53)
Dual	80	1.40	(0.51, 3.86)	76	1.55	(0.61, 3.94)
Poly	85	2.15	(0.86, 5.34)	149	**4.73**	**(1.92, 11.68)**
Afro-Caribbean Females						

	Perceived Racial Discrimination Index[a]					
	One of the nine experiences			At least two of the nine experiences		
Patterns of Substance Use	***n***	**OR**	**95% CI**	***n***	**OR**	**95% CI**
Never	29	REF		17	REF	
Single	36	1.52	(0.84, 2.75)	23	2.47	(0.89, 6.82)
Dual	13	0.81	(0.25, 2.66)	16	**3.41** [e]	**(1.03, 11.35)**
Poly	12	2.42	(0.80, 7.38)	18	4.22	(0.92, 19.28)
Afro-Caribbean Males						
Never	9	REF		8	REF	
Single	29	1.97	(0.60, 6.49)	22	2.66	(0.76, 9.29)
Dual	48	1.83	(0.45, 7.44)	37	3.41	(0.59, 19.76)
Poly	28	0.97	(0.30, 3.06)	25	1.78	(0.53, 5.99)

[a] Number of different experiences of discrimination attributed to race

[b] Estimates are adjusted for age, sex, education, and income

[c] Estimates are adjusted for age, ethnicity, education, and income

[d] Estimates are adjusted for age, education, and income

[e] Association is no longer statistically significant after correction for multiple testing.

Exposure referent group: None of the nine experiences

Models stratified to include Afro-Caribbeans are also adjusted for immigration status

Table 5.

Effect Modification by Ethnicity, by Sex, and by Ethnicity and Sex of Associations between the Racial Discrimination Index and Current Substance Use by Ethnicity (*N*=3,589)

	Perceived Racial Discrimination Index[a]					
	One of the nine experiences			At least two of the nine experiences		
Patterns of Substance Use	***n***	**OR**	**95% CI**	***n***	**OR**	**95% CI**
By Ethnicity [b]						
African Americans						
Never/ever	186	REF		136	REF	
Single	199	0.98	(0.74, 1.30)	185	1.23	(0.90, 1.68)
Dual/Poly	153	**1.72**	**(1.25, 2.36)**	176	**2.63**	**(1.92, 3.59)**
Afro-Caribbeans						
Never/ever	74	REF		50	REF	
Single	86	0.93	(0.60, 1.45)	79	**2.68**	**(1.33, 5.39)**
Dual/Poly	44	0.63	(0.37, 1.07)	37	2.01	(0.68, 5.94)
By Sex [c]						
Females						
Never/ever	176	REF		107	REF	
Single	145	0.92	(0.69, 1.23)	110	1.23	(0.85, 1.77)
Dual/Poly	85	**1.74**	**(1.18, 2.56)**	70	**2.50**	**(1.59, 3.92)**
Males						
Never/ever	84	REF		79	REF	
Single	140	1.06	(0.64, 1.75)	154	1.36	(0.88, 2.10)
Dual/Poly	112	1.62	(0.99, 2.65)	143	**2.72**	**(1.72, 4.28)**
By Ethnicity and Sex [d]						
African American Females						
Never/ever	130	REF		77	REF	
Single	110	0.91	(0.67, 1.23)	77	1.17	(0.80, 1.72)
Dual/Poly	76	**1.72**	**(1.15, 2.57)**	59	**2.46**	**(1.54, 3.92)**
African American Males						
Never/ever	56	REF		59	REF	
Single	89	1.09	(0.63, 1.89)	108	1.32	(0.83, 2.11)
Dual/Poly	77	**1.78** [e]	**(1.04, 3.03)**	117	**2.80**	**(1.72, 4.55)**
Afro-Caribbean Females						
Never/ever	46	REF		30	REF	
Single	35	1.21	(0.71, 2.06)	33	**3.35** [e]	**(1.15, 9.79)**
Dual/Poly	9	1.53	(0.49, 4.77)	11	1.58	(0.48, 5.16)
Afro-Caribbean Males						
Never/ever	28	REF		20	REF	
Single	51	0.61	(0.30, 1.24)	46	1.88	(0.63, 5.59)

	Perceived Racial Discrimination Index[a]					
	One of the nine experiences			At least two of the nine experiences		
Patterns of Substance Use	***n***	**OR**	**95% CI**	***n***	**OR**	**95% CI**
Dual/Poly	35	0.40	(0.15, 1.05)	26	1.80	(0.37, 8.78)

[a]Number of different experiences of discrimination attributed to race

[b]Estimates are adjusted for age, sex, education, and income

[c]Estimates are adjusted for age, ethnicity, education, and income

[d]Estimates are adjusted for age, education, and income

[e]Association is no longer statistically significant after correction for multiple testing.

Exposure referent group: None of the nine experiences

Models stratified to include Afro-Caribbeans are also adjusted for immigration status