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Racism-related stress, health outcomes, substance use, and PrEP attitudes among Asian sexual minority men

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Racial discrimination has been linked to decreased psychological well-being and physical health. Most Asian Americans in the United States reported discrimination against Asians as a major problem and that inadequate attention is given to racial inequities affecting Asians living in the US. We described the association of racism-related stress and health outcomes among Asian American sexual minority men. We hypothesized that greater racism-related stress is associated with poor general and oral health, increased substance use, and unfavorable attitudes about PrEP. We conducted a secondary analysis of data collected in 2017–2019 through the HIV Oral Self-Testing Infographic Experiment study, a pilot behavioral randomized controlled trial testing effects of an HIV self-testing infographic in 322 emerging adult ethnic and racial sexual minority men. We examined secondary data on racism-related stress and health outcomes in 62 participants using questions derived from the Behavioral Risk Factor Surveillance System, National Survey on Drug Use and Health, PrEP Familiarity and Attitudes Questionnaire, and the Asian American Racism-related Stress Inventory (AARRSI). To describe association between AARRSI scores and health outcomes, we calculated mean total AARRSI scores across categorical variables and assessed differences between groups using one-way ANOVA, and we assessed correlation between continuous variables with scores using Spearman correlation. Findings suggested that greater racism-related stress is linked to increased substance use. More research is needed to confirm these observed trends with larger, more diverse samples, explore intersectional factors such as sexual minority identity and societal discrimination against Asians, and how the current political climate has contributed to negative experiences that amplify health risks.

Keywords Racism, Asian, Stress, Sexual minority men, Substance use, PrEP

Racial discrimination is defined as the "psychological response specifically from direct or indirect exposure to racism," and has been linked to decreased psychological well-being and physical health[1,2]. In the United States (US), a 2023 report found that 57% of Asian Americans reported discrimination against Asians as a major problem and 63% reported too little attention is given to the issue of racial issues that affect Asian individuals living in the US[3]. Substance use among Asian American adults has increased as compared to White Americans and is attributed, in part, to the COVID-19 pandemic, which originated in China and has resulted in ongoing social hostility and violence towards Asians living in the US[4,5]. A 2023 survey showed one-third of Asian adults know another Asian person who has been threatened or attacked due to their race since 2020[3]. High-profile media coverage of mass shootings with Asian victims, such as those in Atlanta in 2021 and Monterey Park and Half-Moon Bay in 2022, have also heightened stress among this community in recent years[6,7]. There is substantial literature about the connections between racism and poor health outcomes in ethnic and racial individuals, but studies have not adequately assessed these effects on Asian-identifying individuals[8].

Increased alcohol consumption and cigarette use among Asian Americans have been linked to coping behaviors for discrimination[9]. However, alcohol consumption and cigarette use are behavioral risk factors that contribute to the onset of chronic diseases such as metabolic syndrome and cardiovascular disease[10]. Limited

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studies have also assessed e-cigarette use, which has increased in popularity over recent years, as a coping behavior associated with reported discrimination. Health risks are further amplified by the intersection of factors such as race, ethnicity, and sexual orientation at the individual level and structural level. For example, Asian American gay men with higher levels of sexual minority stress were reported to experience lower levels of self-esteem and higher levels of psychological distress[11]. Clinical symptoms of physical illness can also manifest through continued stress from adverse experiences and internalized stigma, where an individual holds negative affect towards themselves when acknowledging their sexuality[12,13]. A predominant health risk in sexual minoritized populations is HIV; in the US, sexual minoritized men account for 67% of all new HIV diagnoses[14]. HIV prevention measures, such as pre-exposure prophylaxis (PrEP), have not seen strong uptake within Asian communities and Asian sexual minority men may forgo PrEP due to stigma associated with non-heterosexuality and HIV[15]. However, it is unknown whether greater racism-related stress, which may be indicative of a stronger association with Asian identity, is correlated with PrEP hesitancy and uptake among Asian sexual minority men.

Conceptual model

The link between racism-related stress and poor health outcomes can be explained through the Minority Stress Model. It posits that additional stress due to minority status, such as sexual orientation or race, in excess of everyday stress in the social environment may contribute to detrimental health behaviors leading to poor health outcomes[16]. Distal stressors may be related to events that are not directly experienced by an individual, such as circulating news about an incident of discrimination against someone of a similar social identity. Distal stressors for sexual minorities include societal hostility, violence, and stigma and can evoke stress even if the individual does not fully identify with the assigned minority identity being targeted[17]. Stressful external events lead to anticipation and vigilance to avoid them, which in turn contributes to the internalization of negative societal attitudes, such as sexual orientation concealment; these immediate thoughts and actions are considered proximal stressors for the individual. The transition to proximal stressors via cognitive appraisal contributes to poor mental health and fear of revealing one's identity such as internalized homophobia, sexual orientation concealment, or perceived discrimination. Thus, stigma contributes to chronic stress even in the absence of personal discriminatory experiences.

While much literature has documented the effects of discrimination on substance use in ethnic and racial minorities, there is a dearth of literature exclusively centering Asian emerging adult sexual minority men, providing an opportunity to examine associations between social factors, behaviors, and health outcomes in this group[18,19]. The purpose of this study was to describe the association of racism-related stress, health outcomes, substance use, and attitudes towards PrEP. We hypothesize that greater racism-related stress is associated with poor general and oral health, increased substance use, and unfavorable attitudes about PrEP.

Methods

Design

This is a secondary analysis of data collected in 2017–2019 through the HIV Oral Self-Testing Infographic Experiment (HOTIE) study, a pilot behavioral randomized controlled trial to test the effects of an HIV self-testing infographic in 322 emerging adult ethnic and racial sexual minority men[20]. We analyzed a subset (n = 62) of HOTIE participants data, which was focused on individuals who self-identified as Asian. Participants were recruited throughout the US and Puerto Rico through an online research recruitment service. Eligibility for the HOTIE study included: (1) ages 18–34, (2) reported HIV serostatus negative or unknown, (3) self-identify as non-heterosexual, (4) assigned male at birth, (5) able to read and understand English, and (6) access to the internet. Details of the primary study can be found elsewhere[20]. In this study, we examined Asian HIV-negative, emerging adult participants to describe associations between racism-related stress, health outcomes, substance use, and attitudes towards PrEP.

Ethical considerations

The parent study[20] was approved by the Institutional Review Board of Yale University (IRB HSC# 1610018552, approved 20 November 2017) and New York University (IRB-FY2018-1573, approved 18 January 2018), and was registered on clinical trials.gov NCT04061915. Further ethical approval is therefore not required for the current study.

Measures

Demographic questionnaire

Self-reported demographic information from the primary study was collected from participants using Qualtrics. Survey questions assessed ethnic or cultural group background, race, place of birth (within or outside the US), age, highest level of education, type of health insurance, and total personal income in the last year.

Behavioral risk factor surveillance system (BRFSS)

The BRFSS is a 2-part telephone survey developed by the CDC that collects information regarding chronic conditions and health risk behaviors. Selected questions for this study surveyed tobacco and e-cigarette use. Example questions included the following: "Have you smoked at least 100 cigarettes in your entire life?" "Do you now use e-cigarettes or other electronic vaping products every day, some days, or not at all?" General health status was assessed using a single question: "Would you say that in general your health is?" Responses were collected through a five-point Likert scale from poor (1) to excellent (5). Oral health status was assessed using two questions, the first of which was, "Including all types of dentists, such as orthodontists, oral surgeons, and all other dental specialists, as well as dental hygienists, how long has it been since you last visited a dentist or a dental clinic for any reason?" Responses ranged from "Within the past year" (1) to "5 or more years ago"

(4) and "Never" (5). The second oral health question read as follows: "Not including teeth lost for injury or orthodontics, how many of your permanent teeth have been removed because of tooth decay or gum disease?" Responses ranged from "None" (1) to "All teeth" (4). A study with 57,001 persons of Asian heritage previously used BRFSS to examine demographic and socioeconomic characteristics in the context of diabetes prevalence, demonstrating validity across Asian American subgroups[21].

National survey on drug use and health (NSDUH)
Cigarette, e-cigarette, and alcohol use questions were derived from the National Survey on Drug Use and Health. Cigarette use as a frequency of use was assessed through the question: "Do you now use e-cigarettes or other electronic vaping products every day, some days, or not at all?" Responses were measured using a three-point Likert scale from not at all (1) to every day (3). Consumption of alcohol as a frequency of use during the past 30 days was assessed with the question: "During the past 30 days, how many days per week or per month did you have at least one drink of any alcoholic beverage such as beer, wine, a malt beverage or liquor?" Responses were collected in a phrase-completion format where whole numbers were input by participants. NSDUH was previously used in a study examining substance use and dependence in over 9000 individuals of single and mixed-race Asian heritage, demonstrating prior usage of this questionnaire across multiple Asian ethnic groups[22].

PrEP familiarity and attitudes questionnaire
PrEP Use, Familiarity, and Attitudes were assessed with three separate multiple-choice questions. PrEP use was assessed with the question: "PrEP is the use of a medication taken before having sex as protection against HIV infection. Are you currently taking PrEP?" Responses were measured dichotomously (0 = No, 1 = Yes). PrEP familiarity was assessed with the question: "Truvada is a pill that HIV negative people can take to prevent HIV. This is called PrEP or Pre-Exposure Prophylaxis. How familiar are you with Truvada also called PrEP?" Responses were measured with a three-item Likert scale from 1 (not familiar or I do not know about PrEP) to 3 (Familiar or I know about PrEP). PrEP attitudes were assessed with the question: "How do you feel about HIV-negative people taking Truvada as PrEP to prevent transmission of HIV?" Responses were measured with a four-point Likert scale from 1 (extremely negative) to 4 (extremely positive).

Asian American racism-related stress inventory (AARRSI)
Racism-related stress was measured through 13 items, including statements such as "You see a TV commercial in which an Asian character speaks bad English and acts subservient to non-Asian characters," "You hear that Asian Americans are not significantly represented in management positions," and "Someone asks you what your real name is." Responses were collected using a 5-point Likert scale from 1 (This has never happened to me or someone I know), 2 (This event happened and I was slightly bothered) to 5 (This event happened and I was extremely upset). In a study of 622 Asian-identifying individuals, the AARRSI demonstrated internal consistency ranging from 0.87 to 0.88 and showed good fit across different Asian ethnic groups and across foreign and U.S.-born samples[22]. A follow-up question assessed the perceived reason(s) for the adverse experience: "What do you think is the main reason for these experiences?" Participants could indicate more than one response out of 11 potential responses such as "Your Ancestry or National Origins," "Your Height," and "Your Sexual Orientation". We summed participants' AARRSI scores to yield a total AARRSI score per participant.

Analysis

We used descriptive statistics to summarize sociodemographic characteristics, racism-related stress, self-identified reasons for discrimination, general and oral health, substance use, and attitudes towards PrEP of the sample. To describe the association between AARRSI scores and health outcomes, substance use, and attitudes towards PrEP, we calculated mean total AARRSI scores across categorical variables and assessed differences between groups using one-way ANOVA, while for continuous variables we assessed their correlation with scores using Spearman correlation. Furthermore, as AARRSI scores differed significantly by substance use groups (i.e., e-cigarette use, yes versus no; cigarette use, yes versus no), we assessed if there were statistically significant differences between the substance groups with regard to sociodemographic characteristics using student's t-test to compare the mean age between groups and Fisher's exact test to assess associations with dichotomous sociodemographic variables. We collapsed categorical variables into dichotomous categories to reduce the number of categories and cells with few subjects. Such analyses were not performed for alcohol consumption given that this data was only available for a small subset of the sample. All hypothesis testing used $\alpha = 0.05$ as the threshold to indicate statistical significance. Statistical analyses were conducted in SAS version 9.4.

Results

The sociodemographic characteristics of the sample (N = 62) are shown in Table 1. The mean age was 27 years (SD = 4.9 years), and most participants reported being born in the US (75.8%). While all of the present sample identified as Asian, 8% also identified as multiracial or Hispanic/Latinx. Most participants reported being employed (71%) and 22.6% were students. Educational attainment varied across the sample from high school completion to post-college degree, and more than half of participants completed at least a 4-year degree. Annual income varied widely; a quarter of participants fell below 150% of the 2019 federal poverty line ($12,490) making less than $20,000 annually whereas most (64.5%) earned between $20,000 and $90,000. Most participants (79%) had some type of private or public health insurance.

AARRSI total scores ranged from a minimum of 13 (score of 1 for each of the 13 items) to a maximum of 65 (score of 5 for each of the 13 items) (Table 1). The mean AARRSI total score was 34.7 (SD = 11.5). Number of self-identified reasons for experiencing discrimination ranged from a single reason to 9 out of 13 reasons offered,

Characteristics	Mean ± SD or N (%)[a]
Age (years)	26.6 ± 4.9
Hispanic/Latinx Ethnicity	
Hispanic/Latinx	5 (8.1)
Not Hispanic/Latinx	57 (91.9)
Place of Birth	
United States	47 (75.8)
Outside of United States	15 (24.2)
Highest educational level	
High school	8 (12.9)
Some college	15 (24.2)
2-year degree	5 (8.1)
4-year degree	21 (33.9)
Post-college degree	13 (21.0)
Employment	
Student	14 (22.6)
Employed, part-time	9 (14.5)
Employed, full-time	30 (48.4)
Self-employed	5 (8.1)
Unemployed	4 (6.5)
Annual Income	
Less than $20,000	15 (24.2)
$20,000–$59,999	26 (41.9)
$60,000–$89,999	14 (22.6)
$90,000 and above	7 (11.3)
Insurance Status	
Insured	49 (79.0)
Parents' plan	12 (19.4)
Government-sponsored plan	12 (19.4)
Private health insurance	25 (40.3)
Uninsured	13 (21.0)
AARRSI Total Score	34.7 ± 11.5

Table 1. Sociodemographic Characteristics (n = 62). SD, standard deviation. [a]Percentages may not sum to 100% due to rounding.

with an average of 2.3 reasons selected (SD = 2.0) (Table 2). Most participants viewed their race as a reason for discriminatory experiences (66.1%), and about half viewed their ancestral heritage or national origin as a reason (48.4%). A quarter of participants self-identified that discrimination may have been largely due to their shade of skin color (24.2%). One-fifth of the sample viewed their sexual orientation (17.7%) or other aspect of physical appearance (17.7%) as main discriminatory reasons.

In Table 3, most participants described their health as "Excellent" or "Very Good" (62.9%), had seen a dentist within the past year (61.7%), and had no teeth removed due to tooth decay or gum disease (91.8%). Although 75.8% of participants were familiar with PrEP and 90.3% of participants approved of HIV-negative individuals taking PrEP to prevent transmission of HIV, only 6.5% of participants were currently on PrEP. On average, participants had at least one drink of any alcoholic beverage 2.6 days (SD = 2.3 days) in a given week.

The AARRSI total scores by general and oral health, substance use, and attitudes towards PrEP categories are depicted in Table 3. AARRSI was revealed to have a significant relationship with e-cigarette use, cigarette use, and alcohol consumption. Participants who used e-cigarettes had a higher mean total AARRSI score than those who did not use e-cigarettes ($p = 0.025$), and cigarette users also had a higher mean total AARRSI score than those who did not smoke ($p = 0.048$). While there was no correlation between alcohol consumption and total AARRSI scores ($p = 0.446$), there was a statistically significant difference ($p = 0.046$) between mean total scores for at least one group of alcohol consumption as compared with others when consumption was separated into categories of consumption frequency (0–1, 2, 3–4, and > 4 days per week), where mean total score for > 4 days per week was significantly greater than that of only 2 days per week. There were no statistically significant differences in mean total AARRSI scores across groups of perceived health, time since last dental visit, removal of teeth due to decay or gum disease, familiarity with PrEP, attitude towards PrEP, and PrEP usage.

In Table 4, participants' AARRSI scores and sociodemographic characteristics in relation to cigarette and e-cigarette usage are presented. Other than the abovementioned statistically significant differences in AARRSI scores between cigarette smokers and non-smokers, there were no significant differences in scores between the two groups. However, there were sociodemographic differences within these substance use categories. There was

Reason for discrimination	*N* (%)[a] or Mean ± SD
Age	7 (11.3)
Ancestry of national origins	30 (48.4)
Gender	9 (14.5)
Education or income level	3 (4.8)
Height	7 (11.3)
Race	41 (66.1)
Religion	2 (3.2)
Sexual Orientation	11 (17.7)
Shade of skin color	15 (24.2)
Some other aspect of physical appearance	11 (17.7)
Weight	5 (8.1)
Number of reasons selected	2.3 ± 2.0

Table 2. Self-reported reasons for discriminatory experiences (n = 62). SD, standard deviation. [a]Percentages do not sum to 100% as participants could select more than 1 choice.

a significantly larger proportion of e-cigarette non-users who were not Hispanic/Latinx (96.2%, $p = 0.026$). All e-cigarette users were employed; this proportion of participants was significantly larger than the proportion of e-cigarette non-users who were employed (65.4; $p = 0.027$).

Discussion

The purpose of this study was to describe the association of racism-related stress, general and oral health outcomes, substance use, and attitudes towards PrEP. Prior research has often excluded Asian sexual minoritized individuals from statistical analyses due to inadequate, small numbers of participants from this group, whereas this work centers them as a population of interest. Previously, only qualitative observations from this group and inferences from statistical studies aggregated with other sexual minoritized groups of color indicated that discrimination contributes to increased substance use and increased risk of HIV within the Asian sexual minoritized community[18,23]. Quantitative insights presented here provide additional support for distal and proximal stressors contributing to unhealthy behaviors. This study advances the literature on health outcomes and substance use in emerging adult, Asian sexual minority men as we found that proximal stress deriving from racism is associated with increased use of alcohol, e-cigarettes, and cigarettes. These relationships were previously undiscovered within the primary study; analysis of this subsample generated new insights for under-researched health behaviors and stressors of this population.

Substance use

Discriminatory experiences were reported as mainly due to race, heritage, or national origin, indicating that a stress scale specific to Asian-American racism was appropriate to quantitatively gauge individuals' feelings of distress. We also found that sexual orientation, skin color, and physical characteristics were reported sources of discrimination, highlighting awareness of intersectional factors contributing to stress as suggested by the Minority Stress Model. These discriminatory experiences may serve as catalysts for substance use in Asian sexual minority men. Both cigarette use and e-cigarette use was associated with higher racism-related stress, aligning with previous research that identified vaping as a stress-coping mechanism among queer individuals[24]. While the present sample all identified as Asian, the higher proportion of e-cigarette users identifying as Hispanic or Latinx is in line with previous work revealing greater percentages of current e-cigarette users identifying as multiracial and Hispanic or Latino as compared to Asian American[25].

Previous research has found that racism-related stress within sexual minoritized communities is associated with greater odds of heavy alcohol use, and heterosexism within racial minoritized communities is associated with greater tobacco use; this further aligns our findings of increased substance use within the Minority Stress Model[26]. Although previous studies with high proportions of Asian participants did not find significant interactions between experiences of racism and alcohol use, such studies aggregated results of multiple ethnicities across a broader and older age range[27]. Work by Pachankis et al.[28] described a relationship between stress and alcohol in young sexual minority men to cope with perceived rejection before turning to tobacco. Alcohol use is especially concerning in emerging adults as social drinking is common within this age demographic.

Health outcomes

Although participants exhibited higher mean AARRSI scores associated with tobacco and alcohol use, the lack of differences in health and oral health outcomes does not preclude health status change in the future. Participants were emerging adults and may potentially develop adverse health conditions later on in life. Long-term alcohol and tobacco use is well-documented to contribute to adverse health outcomes such as heart failure, and substance use creates a health trajectory towards dangerous chronic disease such as heart disease, cancer, and mental health conditions[10,29,30].

Health behaviors and health outcomes	*N* (%)[a] or Mean ± SD	AARRSI scores Mean ± SD	*P*[b]
E-cigarette use			0.025
No	52 (83.9)	33.3 ± 10.7	
Yes	10 (16.1)	42.1 ± 13.6	
Cigarette use			0.048
No	56 (90.3)	33.8 ± 10.7	
Yes	6 (9.7)	43.5 ± 16.2	
E-cigarette and/or Cigarette use			0.096
Neither e-cigarette nor cigarette	50 (80.6)	33.3 ± 10.7	
E-cigarette only	6 (9.7)	37.7 ± 10.5	
Both e-cigarette and cigarette or cigarette only	6 (9.7)	43.5 ± 16.2	
Either e-cigarette or Cigarette use			0.048
No	50 (80.6)	33.3 ± 10.7	
Yes	12 (19.4)	40.6 ± 13.4	
General Health			0.307
Excellent	13 (21.0)	39.2 ± 13.6	
Very Good	26 (41.9)	34.3 ± 11.8	
Good	16 (25.8)	31.1 ± 9.5	
Fair or Poor	7 (11.3)	35.9 ± 9.8	
Time Since Last Dentist Visit (n = 60)[c]			0.581
< 1 year	37 (61.7)	36.1 ± 12.8	
1–< 2	8 (13.3)	31.1 ± 6.8	
2—5	6 (10.0)	34.7 ± 14.6	
> 5 or never	9 (15.0)	31.6 ± 5.7	
Teeth Removed due to decay or gum disease (n = 61)[d]			0.543
None	56 (91.8)	34.5 ± 11.8	
At least 1	5 (8.2)	37.8 ± 10.7	
Familiarity with PrEP			0.366
Familiar	18 (29.0)	37.6 ± 12.2	
Somewhat familiar	29 (46.8)	32.7 ± 10.6	
Not familiar at all	15 (24.2)	35.1 ± 12.4	
Attitude towards PrEP use			0.766
Extremely positive	25 (40.3)	33.7 ± 13.4	
Somewhat positive	31 (50.0)	35.8 ± 11.0	
Neither positive nor negative	6 (9.7)	33.3 ± 4.8	
PrEP Usage			0.992
Yes	4 (6.5)	34.8 ± 8.2	
No	58 (93.5)	34.7 ± 11.8	
Alcohol Consumption, consumption days per week (n = 26)[e]			0.046
0–1 days per week	7 (26.9)	37.7 ± 8.6	
2 days per week	7 (26.9)	33.0 ± 11.7	
3–4 days per week	5 (19.2)	30.8 ± 3.4	
> 4 days per week	7 (26.9)	45.1 ± 11.6	
Alcohol Consumption, consumption days per week (n = 26)[f]	0.446[g]		

Table 3. Asian American racism-related stress inventory (AARRSI) scores and health behavior and outcomes (n = 62). SD, standard deviation; PrEP, pre-exposure prophylaxis. [a]Percentages may not sum to 100% due to rounding. [b]*P*-value of t-test for AARRSI Total Score, one-way ANOVA. [c]2 participants did not know the timing of their last dental appointment. [d]1 participants did not know if they had teeth removed due to decay or gum disease. [e]2 participants reported no alcohol consumption. [f]36 participants did not respond to the question on alcohol consumption of the last 30 days. [g]*p*-value of Spearman correlation.

PrEP attitudes

Research on PrEP has suggested that alcohol can interfere with regular adherence and increase risk of HIV transmission[31–33]. Individuals with excessive consumption were 6 times more likely to be nonadherent to PrEP, likely due to inhibited cognitive function from intoxication, and misinformation about interactive toxicities between alcohol and PrEP encouraged occasional skipping of doses. These studies contextualize our findings of substance use trends with potentially detrimental effects on PrEP knowledge and use. While this study showed

Characteristics	E-cigarette use			Cigarette use		
	No (n = 52)	Yes (n = 10)		No (n = 56)	Yes (n = 6)	
	Mean ± SD or N (%)	Mean ± SD or N (%)	*P*[a]	Mean ± SD or N (%)	Mean ± SD or N (%)	*P*[a]
AARRSI total score	33.3 ± 10.7	42.1 ± 13.6	0.025	33.8 ± 10.7	43.5 ± 16.2	0.048
Age (years)	26.4 ± 5.1	27.3 ± 3.6	0.606	26.5 ± 5.0	27.2 ± 3.7	0.753
≥ 26 years old	28 (53.9)	7 (70.0)	0.491	30 (53.6)	5 (83.3)	0.220
Not Hispanic/Latinx	50 (96.2)	7 (70.0)	0.026	52 (92.9)	5 (83.3)	0.410
Born in U.S	40 (76.9)	7 (70.0)	0.693	42 (75.0)	5 (83.3)	1.000
> 4-year degree or more	27 (51.9)	7 (70.0)	0.490	32 (57.1)	2 (33.3)	0.396
Employed	34 (65.4)	10 (100.0)	0.027	38 (67.9)	6 (100.0)	0.168
Annual Income < $60 K	36 (69.2)	5 (50.0)	0.285	39 (69.6)	2 (33.3)	0.167
Insured	40 (76.9)	9 (90.0)	0.673	45 (80.4)	4 (66.7)	0.597

Table 4. Asian American racism-related stress inventory (AARRSI) scores and sociodemographic characteristics of participants by E-cigarette and cigarette use (n = 62). SD, standard deviation. [a]*P*-value is for t-test for AARRSI Total Score and continuous age or Fisher's exact test for all the other characteristics, which are binary variables.

no relationship between familiarity with PrEP and racism-related stress, previous research has found that Asian sexual minority men who held the knowledge to protect themselves and participate in safe sex did not always do so[23]. Discrimination in both sexual minoritized and Asian communities may contribute to low self-esteem and sexual power that subsequently limits agency to negotiate safer sexual behavior with partners independent of HIV prevention knowledge[34]. Also in line with the Minority Stress Model, sexual orientation concealment, a proximal stressor, has been associated with lower health literacy around HIV prevention, which may help explain the wide gap seen in this subsample between PrEP knowledge and use[35].

Limitations

First, the subsample was small, which limits generalizability of findings to all Asian sexual minority men. However, the study advances the literature since there is limited literature that exclusively assesses health risks in this subgroup. Second, sample size may have contributed to insignificant power to detect significant trends in substance use and health outcomes. There were only small fractions of participants who identified in some categories of interest, such as identifying as multiracial, having military provided insurance, differing numbers of teeth removed, and varying cigarette smoking frequencies. Third, some responses were missing, e.g., participants had poor recall of health outcomes and substance use and selected "Don't Know" in response to survey questions. Because of these shortfalls, cell sizes were too small to run stratified analyses so demographic subcategories were merged and consequently offered less granularity during data analysis. Sample size limitations suggest the need for future studies with larger, more diverse samples of Asian sexual minority men to confirm the trends observed in this study. Fourth, secondary analysis narrows the scope of potential exploration of new hypotheses to the existing variables collected in the primary study. Fifth, the cross-sectional nature of this study can only support association and not causation between racism-related stress and the outcomes of interest. Nonetheless, our findings provide new insights into stressors and behaviors that have been previously linked with increased HIV risk and may help elucidate temporal relationships and HIV risk related to discrimination and substance use.

Implications for policy

Our findings suggest an association between reported discrimination and substance use among sexual minoritized Asian men in the US. Therefore, laws that protect Asian Americans from discrimination may improve health outcomes for this population. As of August 2024, there are 527 anti-LGBTQ bills in the US. Of those, 108 bills are advancing with 23 bills seeking to weaken civil rights laws for sexual and gender minoritized individuals[36]. Even arguments to dismantle LGBTQ rights can function as distal and proximal stressors that increase self-stigma and increase risk for detrimental health behaviors and conditions. Thus, state and federal policies need to proactively protect and fund this community's access to wellness resources such as preventive care, medications such as PrEP, or programming such as mental health counseling to reduce chronic health disparities for sexual minoritized Asian men and improve their well-being on state and national levels.

Implications for research

The cross-sectional nature of this study does not allow for a causal relationship to be drawn between substance use and racism-related stress, so future studies must investigate temporal relationships between these two variables. Longitudinal studies and qualitative research should be conducted within the Asian sexual minoritized community to elucidate whether substance use is a coping strategy or other direct result of racism-induced stress. Questions should be posed to explore greater and deeper relationships between racial and ethnic identities, health behaviors, and health outcomes for this group as well. Some participants who identified as Hispanic/Latinx in addition to Asian may have done so due to their cultural heritage, as in the case of some Filipino Americans, or identified due to ancestral heritage or geographic origin from a Hispanic/Latinx nation[37].

Further work examining multiracial Asian sexual minority men and their experiences with racism can also help elucidate the complex intersecting identities they hold and how they impact wellbeing.

Conclusion

This study described the association of racism-related stress, health outcomes, substance use, and attitudes towards PrEP in Asian emerging adult sexual minority men. Our findings highlighted that greater racism-related stress is linked to increased substance use and provided a better understanding of the associations between health outcomes, health behaviors, and social determinants of health. Findings from this study can prompt further research to confirm these trends with larger samples, explore intersectional factors such as sexual minority identity and societal discrimination, and how the current political climate has contributed to negative experiences that amplify health risk. Understanding the potential mechanisms of racism in deteriorating health will be instrumental in constructing culturally competent interventions to protect mental and physical health and improve HIV prevention among Asian HIV-negative, sexual minority men.

Data availability

The datasets generated and/or analysed during the current study are not publicly available due to the sample size and potential risk of connecting identifiers, but are available from the corresponding author on reasonable request.

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All authors drafted the main manuscript text, LC and RH conducted analyses, LC prepared tables. All authors reviewed the manuscript prior to submission.

Declarations

Competing interests

The authors declare no competing interests.

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