What's PrEP?: Examining Factors Associated with PrEP Peer Navigator Acceptability among Black and Latinx MSM in Western Washington

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Abstract

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Background: HIV PrEP (pre-exposure prophylaxis) is underutilized among Black and Latinx men who have sex with men (MSM). We aimed to estimate interest in peer navigation for PrEP services among minority MSM in Western Washington.

Methods: HIV-negative participants aged ≥16 identifying as Black or Latinx MSM completed a REDCap survey in English or Spanish. Survey questions pertained to: demographics, insurance status, access to care, knowledge and attitudes towards PrEP, sexual stigma, mental health, HIV risk assessment, substance and medication use, attitudes towards peer navigation, and importance of peer attributes. Recruitment took place through community-based organizations, flyers, Facebook campaigns, and word of mouth. Factor analysis was used to derive a score for peer navigator interest, and linear regression was utilized to identify associations of participant attributes with this outcome.

Results: Among 95 participants (32 Black, 63 Latinx), median age was 30 (IQR 26-40) years. 73% identified as gay, 20% as bisexual, and 5% as queer. Forty-eight percent were interested

in peer navigation for PrEP services. In unadjusted regression, being insured (p=0.02), higher sexual stigma score (p=0.006), higher PHQ-9 score (p=0.01), and having a regular medical provider (p=0.002) were associated with higher interest scores; higher income was associated with lower interest (0.001). In adjusted regression, higher income was negatively associated with peer navigator interest (p=0.04). In limited, multivariable analysis, higher stigma score was associated with peer navigator acceptability. Of proposed peer attributes, the most highly rated was matching on sexual orientation (rated "important" or "very important" by 73% of participants), followed by age (50%) and culture (44%).

Conclusion: Having insurance and a regular provider may influence men's interest in peer navigation for PrEP services. Mental health training for peers could increase PrEP access, given greater interest among men with higher sexual stigma and depressive symptoms. Peer interventions for PrEP should match peers to clients on sexual orientation, age, and culture.

Background and significance

Pre-exposure prophylaxis (PrEP) using oral tenofovir and emtricitabine in a combination daily pill reduces the risk of HIV transmission in those who have sex with HIV-positive partners, if adherence is high or intermittent dosing is timed to sexual activity [1, 2]. In the United States, PrEP has become very popular among many White men who have sex with men (MSM), but has, to date, failed to gain a firm foothold among Black and Latinx populations, who are disproportionately HIV-infected [3]. In 2016, 73% of PrEP users were White, 10% were Black (12% in 2015), and 13% were Latinx [4, 5], similar to the make-up of the general U.S. population [6, 7]. In contrast, White MSM made up only 22% of new HIV infections, while Black MSM made up 31% and Latinx MSM made up 22% of 33,210 new infections in the United States in 2016 [6, 7]. Black and Latinx MSM are disproportionately at risk for HIV compared to White MSM, yet less likely to use PrEP for HIV prevention.

For a number of reasons, Black and Latinx MSM lack equal access to HIV prevention resources. Minority MSM experience discrimination from both within and outside their communities, as a result of both race/ethnicity and sexual minority status [8, 9]. Structural and economic inequities, such as lack of health insurance, higher rates of unemployment, and incarceration further widen the gap between HIV-related health outcomes in Black and Latinx MSM compared to their White counterparts [10-14].

Peer navigators represent one potential strategy to address disparities in HIV acquisition and PrEP uptake among minority MSM, by offering a layperson's perspective on HIV prevention and by helping minority MSM link to and navigate the healthcare system to access the HIV prevention cascade, especially given the role of medical mistrust among Black and Latinx with regards to HIV care [15, 16]. Furthermore, the United States has a legacy of questionable ethics, as evidenced by the Tuskegee Syphilis Study and forced sterilization of minority women, which have contributed to medical mistrust among minority communities[17, 18]. The legacy of mistreatment of people of color has also created a necessity for peer navigators, who may be able to bridge the gap between minority communities and the medical community. Peer navigators have played a key role in disseminating information regarding HIV prevention and safer sex practices, particularly among MSM who have not been reached through typical medical and public health outreach strategies[19]. PrEP-utilizing peer navigators may play a role in combatting medical mistrust and filling in PrEP-related knowledge gaps that exist among minority MSM [20-23]. In a cohort of young Black MSM in Chicago, discussions with confidants regarding HIV prevention were associated with greater PrEP awareness (aOR=2.26, 95% CI 1.00 to 5.09) [24].

Peer navigator interventions targeting linkage to HIV care, retention on anti-retroviral therapy (ART), and engagement in HIV care have provided evidence that peers can improve patient engagement as well as medication adherence [25]. For example, *Project nGage*, a study conducted in Chicago, asked participants to identify "support confidants" who would receive HIV care knowledge along with the "index" participant who recruited the confidant to the study [26]. This study demonstrated that support from non-physicians may improve HIV care engagement compared to standard of care for men of color, as men randomized to the intervention group with a support confidant had a 3-fold greater odds of having more

than three HIV primary care visits in the prior 12 months (95% CI 1.05 to 8.69)[26]. In another study by Cabral et al., a peer intervention was successful in reducing gaps in HIV care for the subset of participants who were stably housed (chi square=5.52, p=0.02) [27]. These examples of successful peer navigation to improve HIV care outcomes lend credence to the potential for peers to play a role in HIV prevention initiatives, such as PrEP implementation and scale-up programs.

Within the context of Seattle and western Washington, where my thesis research took place, Latinx individuals represent a growing population, with many new immigrants from Mexico and South America migrating to the area [28]. Resettlement often encourages individuals to find new communities with similar culture and language. This process of migration might also encourage gathering and seeking out community, which could facilitate peer navigation among Latinx MSM. Furthermore, the stresses of immigration and the threat of deportation within Latinx communities might increase the importance of peer navigator outreach, as Latinx individuals could be afraid to engage with medical providers, especially those who are not Latinx [29].

In contrast, Black communities within the Seattle area are shrinking over time, as many Black families have moved elsewhere in western Washington due to increased housing costs and gentrification [30, 31]. This migration to the suburbs could make it more difficult for Black MSM to connect to peer navigators, as LGBTQ organizations are less prevalent outside of King County, which includes downtown Seattle [30, 31]. While both Black and Latinx MSM are vulnerable to HIV, Black MSM may be at higher risk for HIV transmission given the potential for greater social and cultural isolation in western Washington. For example, Black populations are smaller than Latinx populations in King (6.8% vs 9.7%), Pierce (7.5% vs 10.9%), Snohomish (3.5% vs 10.2%), and Thurston (3.4% vs 9.0%) counties [7]. In a study of Chicago residents conducted by the University of Chicago, Black respondents were less likely to identify as Lesbian, Gay, Bisexual, Transgender, or Queer then Latinx respondents (22% of Latinx respondents vs 14% of Black respondents identified as LGBTQ) [32]. If this is true of western Washington, Black individuals might not see themselves reflected in LGBTQ organizations despite efforts from organizations such as Gay City and LifeLong, and therefore, might be less likely to seek social support from them.

Even if they identify as gay, bisexual, or queer, Black and Latinx men may be challenging to link to HIV prevention services for a variety of reasons, including stigma and medical mistrust, which create barriers to accessing HIV prevention methods such as PrEP [33, 34]. Men who self-identify as gay may feel more confident in their sexual orientation and, therefore, be more willing to access services such as peer navigation, leading to better health outcomes [35]. Additionally, low risk perception may play a role in preventing MSM who are otherwise healthy from seeking HIV prevention services, even in the face of diagnosis with predisposing infections such as rectal gonorrhea or chlamydia [36].

The *What's PrEP?* study aimed to evaluate the acceptability of peer navigation for PrEP use among Black and Latinx men living in Western Washington, and to identify factors associated with higher or lower acceptability of this approach. In addition, the study aimed to identify which peer navigator characteristics were most important to minority MSM. By identifying

modifiable factors associated with acceptability, study findings could be used to identify potential challenges peer navigators might face and to inform the design of programs for effective peer navigation.

Aims

Specific Aim 1: To identify factors associated with acceptability of peer navigation for PrEP uptake and use among Black and Latinx MSM.

Hypothesis: Latinx ethnicity and gay sexual orientation will be associated with higher peer navigator acceptability. In addition, men with lower sexual stigma scores will be more accepting of peer navigation.

Specific Aim 2: To determine which attributes of a hypothetical peer are ranked as most important and which are positively correlated with peer navigator acceptability.

Hypothesis: Race/ethnicity and sexual orientation will be the most important attributes of a hypothetical peer, and the importance placed on matching these attributes will be positively correlated with peer navigator acceptability.

Methods

Study Design

What's PrEP? and its Spanish language version, *Que es PrEP?* was a cross-sectional study that surveyed non-Latinx Black and Latinx cis and transgender MSM.

Study Population

The study aimed to reach up to 100 non-Latinx Black and 100 Latinx cis and transgender MSM. Participants were required to be HIV-negative, male-identified Black or Latinx, age 16 or older, and residing in the Snohomish, Thurston, Pierce, or King counties of western Washington. Participants able to speak English or Spanish were eligible for the study. Participants were recruited by flyer distribution at events, Facebook ads and posts, and word of mouth, with assistance from local HIV and STD clinics and from local community-based organizations including Entre Hermanos, the Center for Multicultural Health (CMCH), the Pierce County AIDS Foundation (PCAF), Project Neon, and Gay City Health Project.

Procedures and Data Collection

Participants took a survey in-person using a printed, self-administered questionnaire or online in Computer-Assisted Personal Interview (CAPI) format using REDCap, a secure web application for building and managing online surveys and databases. The survey collected information on demographics, HIV risk behaviors, alcohol and drug use, depressive symptoms, stigma, healthcare access, PrEP use and delivery preferences, and interest in a peer navigator for the use of PrEP. Surveys took 40-60 minutes to complete. At the end of survey administration, online participants were instructed to leave a phone number where

they could be reached to verify their personal details. This approach was taken to ensure that each survey respondent was unique, as REDCap does not capture internet protocol (IP) addresses. Once confirmed by myself or another member of the research team as a unique participant, participants were reimbursed promptly using a hard-copy Visa card or electronic Tango card worth $40. A subset of 7 non-Latinx Black and 14 Latinx participants underwent an in-depth interview; results of these interviews are reported elsewhere.

Measures

Aim 1 outcome. The Aim 1 outcome was peer navigator acceptability. Participants were asked four questions pertaining to their willingness to use a peer navigator for assistance with HIV prevention and PrEP use. The questions were as follows:

1. If you were taking PrEP, how useful would it be to have someone other than clinic staff remind you of your clinic appointments and help you plan to be there on time?
2. How useful would it be to have someone assigned to help you by reminding you to take medication, especially in the first 1-2 months after starting PrEP?
3. How useful would it be to have someone with experience taking PrEP who could provide advice on managing side effects, taking a daily pill, and planning for refills?
4. How useful would it be to discuss any concerns you have about privacy or other feelings about PrEP with another man of the same race/ethnicity as you who has experience taking PrEP?

Responses were assessed using a 5-point Likert scale, rated as 1=Very harmful/interfering, 2=Somewhat useless or harmful/interfering, 3=Neither useful nor useless, 4= Somewhat useful, or 5=Very useful.

Aim 2 outcomes. Aim 2 outcomes were responses to seven questions about the characteristics of peers that would make a PrEP peer navigator more acceptable. The questions were as follows:

1. How important would it be or a trained peer navigator to be the same racial background as you?
2. How important would it be for a trained peer navigator to identify with the same sexual orientation as you (gay, straight, bisexual, etc.)?
3. How important would it be for a trained peer navigator to be around the same age as you?
4. How important would it be for a trained peer navigator to have the same relationship status as you (unattached, steady relationship, married, etc.)?
5. How important would it be for a trained peer navigator to have an income similar to yours?
6. How important would it be for a trained peer navigator to be from the same culture (Afro-Caribbean, Hispanic, Ethiopian, etc.) as you?
7. How important would it be for a trained peer navigator to be from the same Seattle area neighborhood as you?

Participants rated their responses using a 5-point Likert scale, rated as 1=Not important, 2=Slightly important, 3=Fairly important, 4=Important, or 5=Very important.

Primary predictors

- Race/ethnicity was defined as non-Latinx Black vs Latinx. Black Latinx individuals were classified as Latinx.

- Sexual orientation was defined as gay, straight, bisexual, or queer.
- Sexual stigma was a continuous variable ranging from 0 to 33 (see below under "Mental health variables").

Potential correlates
The potential correlates examined in this study are described below, by domain assessed.

Other demographic variables
- Age in years
- Gender (cisgender or transgender male)
- Education, categorized as less than high school, high school, some college, college, or graduate school
- Monthly income in dollars, categories as $0-$1500, $1501-$3500, and >$3500.

Mental health variables
- *Sexual stigma* was measured using Logie's modified China MSM Stigma Scale, which evaluates perceived stigma and discrimination faced by MSM as pertains to safety, family, and relationships [37]. This is scored on a 0-3 point scale (0=Never, 1=Once or twice, 2=A few times, 3=Many times). Higher scores indicated greater perceived stigma. This score was evaluated as a continuous variable, ranging from 0 to 33.
- *Depressive symptoms* were measured using the Patient Health Questionnaire (PHQ-9), a self-administered set of questions used to identify depressive symptoms in clinical settings [38]. The PHQ-9 is a 9-question survey that uses a 4-point Likert scale (0=Not at all, 1=Several days, 2=More than half the days, 3=Nearly every day) for responses. The 9 response scores are added together for a total score, which was evaluated as a continous variable ranging from 0 to 27.
- *Disordered alcohol use* was measured using the Alcohol Use Disorders Identification Test (AUDIT) [39]. The questionnaire consists of 10 items scored from 0-4, with a score ≥8 indicating hazardous or harmful drinking. The AUDIT score was examined as a continuous variable ranging from 0 to 40.
- *Non-alcohol substance use* was measured using the Drug Abuse Screening Test 10 (DAST-10), consisting of 10 "Yes/No" questions, with a score of 3 or greater indicating harmful substance use [40]. The DAST-10 score was examined as a continuous variable ranging from 0 to 10.

Health behaviors
A series of "Yes/No" questions assessed whether participants had a regular medical provider, had disclosed their MSM status to their provider, and had tested for HIV before. Time since last clinic visit was categorized into less than 4 months, between 4 months and 12 months, and greater than 12 months, as CDC guidelines recommend HIV and STD screening for MSM every 3 to 6 months [41].

HIV risk behavior variables
A series of "Yes/No" questions adapted from the 2014 CDC PrEP clinical practice guidelines [42] were asked to screen for high-risk behaviors in the past 12 months. These included

condomless anal sex with an HIV-negative man, ongoing relationship with an HIV-positive male partner, treatment for a STI, use of post-exposure prophylaxis (PEP), use of crystal meth, use of poppers, non-prescription injection drug use, and exchange sex for drugs, money or housing. A single binary variable was also created, with a value of "1" if any of these high-risk behaviors was present and "0" if no high-risk behavior was present.

PrEP use variables

A series of "Yes/No" questions asked about participants' PrEP awareness and use.

1. Have you ever heard of HIV-negative people taking HIV drugs every day to reduce their chances of getting HIV infection (this is called PrEP, for Pre-Exposure Prophylaxis)?
2. Have you ever been given a prescription for PrEP by a medical professional?

A third question asked about interest in starting or continuing PrEP and was categorized as "Yes/No/Maybe".

3. Are you interested in starting or continuing PrEP?

Statistical analysis

Descriptive statistics (e.g., counts with percentages or medians with interquartile ranges [IQR]) were used to characterize the study population, which presents data for the overall study population and separately for non-Latinx Black and Latinx participants. Chi square exact tests were used to examine differences between categorical variables, and Wilcoxon rank sum tests were used to examine differences in continuous variables across categories, including race/ethnicity.

Aim 1 analysis

Confirmatory factor analysis was conducted to confirm that observed responses to questions regarding participants' willingness to accept a peer navigator for PrEP use underlie an unobserved latent variable for peer navigator acceptability, which could then be used to predict an acceptability score for use as the primary outcome. Unadjusted linear regression was used to evaluate the association of race/ethnicity, sexual orientation, and other variables of interest with peer navigator acceptability. Multivariable models were then constructed, including race/ethnicity and sexual orientation *a priori* and other potential correlates associated with peer navigator acceptability at $p<0.20$ in unadjusted analysis. A sensitivity analysis including the aforementioned *a priori* predictors was then conducted in order to establish a parsimonious model of peer navigator acceptability using variables with peer navigator acceptability at $p<0.20$ in adjusted analysis. A Wald test was conducted to obtain overall p-values for categorical variables included in multivariable analysis.

Aim 2 analysis

Descriptive statistics were used to report the proportion of participants who rated each peer characteristic as "important" or "very important," both overall and by race/ethnicity category. Participants' ratings of the importance of each peer navigator characteristic were

graphed using a stacked horizontal bar chart, with color coding for each Likert scale response. Responses of non-Latinx Black and Latinx participants were compared using Wilcoxon rank sum tests and presented in a bar graph. The correlations between peer navigator attribute ratings and acceptability were examined using Spearman's correlation coefficient.

Power and sample size calculations
Assuming a sample size of 100, divided approximately equally by race/ethnicity, power to detect the differences in acceptability score presented below were expected, given an alpha of 0.05 and a standard deviation of 1 unit between equal groups for a binary variable.

Detectable difference	Power
0.5 units	69.6%
0.6 units	84.4%
0.8 units	97.7%
1.0 units	99.8%

Human Subjects

Study procedures and survey questions were developed in collaboration with community partners at Entre Hermanos, the Center for Multicultural Health, and the King County Health Department. Feedback from these and other partners including Gay City, was used to improve recruitment materials and survey wording when such feedback was obtained. The final study protocol was approved and monitoring by the University of Washington Human Subjects Division. An on-line or printed informed consent document included a detailed description of the study's purpose, procedures, and the risks and benefits of participation. Participants were reassured that their information was confidential, and that their participation was voluntary, with the option of withdrawal from the study at any time. All participants provided informed consent electronically.

The *What's PrEP?* study collected data on sensitive topics such as sexual orientation, sexual practices, HIV risk behaviors, depressive symptoms, and alcohol and other substance use. Potential risks to study participants included stigma or discrimination if their status as MSM, drug use, or other risky behaviors were revealed. The study team took precautions to conduct all surveys in a confidential manner, to de-identify survey responses, and to store data on password-protected, encrypted computers.

Results

Ninety-five participants took the *What's PrEP?* or *Que es PrEP?* surveys, either online (97%) or in-person (3%). Table 1 illustrates the demographic characteristics of participants. The median age was 30 (IQR 26-40) years, with a range of 18 to 66 years of age. Thirty-two (34%) of participants were Black and 63 (66%) were Latinx. All participants were cis-gender men, despite transgender men being eligible to participate. Overall 69 (73%)

participants identified as gay, 19 (20%) identified as bisexual, and 5 (5%) identified as queer/other.

Differences by race/ethnicity

Forty-seven percent of Black individuals and 86% of Latinx participants identified as gay; 6% of Black participants and no Latinx participants identified as straight; 41% of Black and 9% of Latinx participants identified as bisexual; 6% of Black and 5% Latinx participants identified as queer ($p<0.001$). Black participants were older than Latinx participants (42.5 years [IQR 30-54.5] vs 29 years [IQR 25-34], $p=0.001$) and were more likely to be insured (91% vs 67%, $p=0.01$). 48% of Latinx participants were foreign born compared to just 6% of Black participants ($p<0.001$).

Latinx participants also had higher median sexual stigma scores than Black participants (11 [IQR 8-14] vs 8 [IQR 3-12] vs, $p=0.004$). 54% of Latinx and 41% of Black participants had disclosed their sexual orientation to their medical provider ($p=0.01$). 79% of Latinx and 47% of Black participants reported condomless anal intercourse with a man whose status they did not know ($p=0.001$). 57% of Latinx and 22% of Black participants had been treated for a STI in the past 12 months ($p=0.002$), and 25% of Latinx and 6% of Black participants had used Post-Exposure Prophylaxis (PEP) in the past 12 months ($p=0.02$). Overall, 90% of Latinx and 69% of Black participants reported any high risk sexual behavior in the past 12 months ($p=0.01$).

PrEP interest and sexual risk

Figure 3 demonstrates individuals who endorsed at least one high risk sexual behavior: 42% were on PrEP, 30% were interested in starting PrEP, 18% were not on PrEP, but needed more information and 10% were not on PrEP and not interested in PrEP. Figure 4 illustrates the proportion of individuals who did not endorse at least one high risk behavior: none were on PrEP, but 13% were interested in starting PrEP, 69% were not on PrEP, but needed more information, and 19% were not interested in PrEP. This difference was significant with $p<0.001$.

Acceptability of a peer navigator

Overall, 48% of participants were interested in a peer navigator for PrEP services, 41% were ambivalent, and 11% were not interested. Confirmatory factor analysis confirmed that observed responses to the questions on peer navigator acceptability reflected a single, unobserved latent variable or factor with an Eigenvalue of 3.33, associated with higher values of each response. Uniqueness values ranged from 0.33 to 0.50; therefore, all question responses were retained. Rotated factor loadings were used to predict an index score for peer navigator acceptability for each participant, which was used as the primary outcome for regression analyses.

Race/ethnicity and sexual orientation were not independent predictors of peer navigator acceptability score, in unadjusted or adjusted analysis. In the unadjusted model, having health insurance (beta=0.55, 95% CI 0.11 to 0.99, $p=0.02$), higher sexual stigma score (beta=0.05, 95% CI 0.01 to 0.09, $p=0.006$) and higher PHQ-9 score (beta=0.04, 95% CI 0.01 to 0.07, $p=0.01$) were associated with higher peer navigator acceptability. Monthly income greater than $3500, relative to $0 to $1500 (beta=-0.30, 95% CI -0.49 to -0.11, $p=0.002$) and

having a regular medical provider (beta= -0.63, 95% CI -1.03 to -0.23, p= 0.003) were both associated with lower peer navigator acceptability. In the adjusted model, only monthly income greater than $3500 was associated with peer navigator acceptability compared to monthly income between $0 and $1500 (adjusted beta= -0.59, 95% CI -1.09 to -0.10, p=0.02).

Sensitivity analysis

Because we had limited power given a relatively small sample size, we went on to build a more limited model removing variables that were not significant at p<0.20 in our full multivariable model and retaining our *a priori* predictors (i.e., race/ethnicity and sexual orientation). In this model, income greater than $3500 was negatively associated while sexual stigma was positively associated with peer navigator acceptability (adjusted beta= -0.62, 95% CI -1.10 to -0.14, p=0.02; and adjusted beta=0.04, 95% CI, 0 to 0.08, p=0.03, respectively).

Exploration of associations between sexual stigma and other variables

Because higher sexual stigma score was associated with higher peer navigator acceptability in these analyses, we used Wilcoxon rank sum tests to examine associations between sexual stigma score and the following dichotomous variables: ever having tested for HIV, report of any high risk sexual behavior, disclosure of MSM status to medical provider, report of any STD in the past 12 months, and current PrEP use. Having a STD in the past 12 months was the only variable tested that was significantly associated with higher sexual stigma score (p=0.03; median stigma score 11.5 and 9 for those with and without an STD in the past 12 months, respectively). Spearman correlations between stigma score and other psychometric tests were significant for several differences: PHQ-9 (ρ=0.24, p=0.02), AUDIT (ρ=0.28, p=0.01). However, no significant correlation was found between stigma and DAST scores (ρ=0, p=0.98).

Peer attributes

Overall, 73% of participants rated having a peer navigator of the same sexual orientation as "important" or "very important." The proportion of participants who rated sameness of peer attributes as "important" or "very important was 53% for race, 49% for age, 43% for culture, 38% for relationship status, and 38% for living in the same neighborhood. The median rating by Latinx participants for same race, same culture, and same neighborhood were each higher when compared to the median rating by Black participants, but these differences were not statistically significant. Spearman correlations between peer attribute rating and peer navigator acceptability were significant for several differences: age (ρ= 0.29, p=0.01), race (ρ= 0.27, p=0.01), culture (ρ= 0.35, p=0.0008), sexual orientation (ρ= 0.30, p=0.01), and neighborhood (ρ= 0.34, p=0.001).

Discussion

The goal of our study was to gauge acceptability of a peer navigator for PrEP services among Black and Latinx MSM in western Washington. Overall interest in peer navigation was moderate, with just under half of participants expressing interest in PrEP navigation service, which suggests that peer navigation may be one of many strategies to engage MSM of color in HIV prevention efforts. Men with higher sexual stigma scores, higher PHQ-9 scores, and

insurance had higher acceptability scores, while men with higher income and regular medical providers had lower acceptability scores. In initial multivariable analysis, only income was associated with acceptability, with wealthier men being less accepting of peer navigation. In a more limited multivariable model performed to retain power, higher sexual stigma and lower income were associated with higher peer navigator acceptability. When investigating associations between sexual stigma and other variables, having a sexually transmitted infection in the past year was significantly associated with a higher sexual stigma score. The majority of participants were interested in having a PrEP peer navigator with the same sexual orientation and same race/ethnicity as themselves. Overall, there were modest correlations between matching on peer attributes and peer navigator acceptability.

Sociodemographic factors

In the HIV Prevention Trials Network (HPTN) 061 study, which aimed to use multiple approaches to prevent HIV in 6 major cities, peer navigators were used to retain Black MSM in the study [43]. Participants who accepted peer navigation services were younger ($p=0.03$) and more likely to be retained in the study than those who did not accept peer navigation ($p<0.001$)[43]. In our study, age was not a significant predictor of peer navigator acceptability. Race/ethnicity was not a significant predictor of peer navigator acceptability. In addition, identifying as gay was not a predictor of peer navigator acceptability in our study, as initially hypothesized. At least one published study has found that gay identity was correlated with less social isolation and more willingness to engage with a peer outreach worker [44]. However, our study demonstrated that sociodemographic factors were not strong predictors of peer navigator acceptability among Black and Latinx MSM in western Washington, though it is possible that sociodemographic factors may play a role in predicting peer navigator acceptability within the context of a larger study or with actual PrEP delivery.

Structural factors and access to care

In *What's PrEP?,* higher monthly income was associated with lower peer navigator acceptability. Interestingly, the HPTN 073 study of PrEP uptake and adherence among Black MSM found that men with higher incomes had higher rates of PrEP adherence, which suggests that men with means may not need extra help engaging with HIV prevention services [45]. In contrast, there was a positive association between having insurance and acceptability of a peer navigator for PrEP use, although this was not significant in multivariable analysis. There is a paucity of research that would explain why such an association exists. One hypothesis is that individuals with insurance are more willing to explore novel interventions for HIV prevention due to lack of financial concerns surrounding access to care. Having insurance is positively correlated with access to preventative health services, under which PrEP services would fall [46]. In our study, having a regular medical provider was associated with lower peer navigator acceptability, although this factor was not significant in multivariable analysis. In a study by Santelli et al. among adolescents in the United States, confidential visits with a medical provider were associated with discussions about sensitive topics, including sexual orientation and HIV, which suggests that having a regular provider opens up a window for discussions about sexuality and HIV prevention services [47]. Potentially, our participants with regular providers felt they had adequate access to care, and did not feel inclined towards a peer navigator for that reason. Peer navigator acceptability scores were lower when participants disclosed their sexual

orientation to a regular medical provider, but this association was not significant. This might suggest that those who are "out" to their providers feel they do not need peer navigation services, or conversely, that a peer navigator may be able to play a supporting role when a medical provider is not LGBTQ-friendly.

Stigma and Mental health

Mental health has been identified as a barrier to HIV care engagement among young MSM, and peer navigation has been proposed to address this problem [48]. An ethnographic study of Black MSM in New York cited internalized homophobia, stigma, and family rejection as barriers to PrEP use, suggesting that men facing these issues might benefit from greater social support surrounding HIV prevention [49]. In the *What's PrEP?* study, men with higher sexual stigma and depressive symptom scores were more accepting of a peer navigator, suggesting that emotionally vulnerable minority MSM may be more open to PrEP peer navigation. Potentially, primary care providers could consider referring MSM with higher sexual stigma or PHQ-9 scores for peer navigator services. Depression was not a significant predictor of peer navigator acceptability in adjusted analysis. However, higher sexual stigma score was also associated with having tested positive for a sexually transmitted infection in the past 12 months ($p=0.03$) in our sensitivity analysis. An STI diagnosis might be stigmatizing, and also present an opportunity to reach out to MSM with STI diagnoses for peer navigator assignment.

Peer attributes and matching

When asked about specific peer attributes, almost three quarters of participants ranked having a peer of the same sexual orientation as important or very important. Race/ethnicity was also ranked as important or very important by the majority of participants. Based on these findings, peer navigator programs to support PrEP use among MSM of color may need to match peers to clients on sexual orientation and race in order for programs to be effective. In our analysis, gender-queer or non-conforming participants were more accepting of peer navigator services for PrEP than gay, straight, or bisexual identified individuals, though this was not statistically significant. In prior studies involving peer navigation for homeless Black individuals, respondents indicated that having a peer with a similar lived experience was important to them [50]. Same-gender-loving individuals may feel more affirmed with a peer navigator of the same sexual orientation. There were modest, positive associations between matching peer attributes and peer navigator acceptability, with culture and neighborhood being the most significant. Matching on peer navigator attributes, such as sexual orientation and race/ethnicity, when possible may be helpful for PrEP scale up and adherence among minority MSM.

Potential role of peer navigators for PrEP use among Black and Latinx MSM

PrEP marketing that focuses on gay-identifying MSM may be stigmatizing to men in communities of color, especially those who do not identify as gay [51]. For such men, it may be important to emphasize PrEP's value for sexual health and well-being, as opposed to focusing on risk [51]. Our findings suggest that peer navigators for PrEP peer navigation among Black and Latinx MSM may be more acceptable to men if they share a similar sexual orientation with the

navigator – in many cases, this orientation may be something other than gay. The association between a recent STI diagnosis and increased sexual stigmatization suggests that peer navigators might be able to play a role in assisting men diagnosed with STIs to improve their overall sexual health. One potential strategy would be to triage minority MSM with a recent STI diagnosis for peer navigation matched on sexual orientation for STI prevention.

Although the evidence base for how to increase PrEP use in minority communities is still limited, several ongoing studies will examine the role of a peer leader or peer change agent in efforts to increase PrEP knowledge and use among MSM of color [52, 53]. In a cluster-randomized trial led by Patel et al., an intervention focusing on "empowering with PrEP" (E-PrEP) using PrEP-focused messaging on social media platforms disseminated by a peer leader will be compared to an E-Health online control in which participants receive no PrEP-specific or HIV-related information [52]. In *PrEP Chicago*, the effectiveness of peer change agents recruited through social media networks and snowball sampling is being evaluated in an individual-level randomized trial evaluating outcomes including referrals to a PrEP informational hotline; PrEP knowledge, attitudes, and intention for use; and PrEP uptake among study participants [53].

Limitations

This study had several limitations. First, our study had limited power due to its small sample size, particularly for Black participants, who only compromised about one third of our sample. Although the *What's PrEP*? study team included members of racial and sexual minorities and sought input and collaboration from community-based organizations serving MSM of color in the study area, outreach to this group remained difficult, and mistrust of research was common. This limited power decreased our ability to identify independent predictors of peer navigator acceptability in multivariable analysis. Second, the study took place in western Washington, which is not a racially diverse area and, therefore, our participants' experiences may not be representative of those of MSM living in more diverse cities. Third, online surveys are prone to fraudulent activity, and it is possible that there may have been duplicate surveys completed by the same individual using different contact information, despite the safeguards put in place. In addition, three men who did not trust us with their contact details could not be confirmed as participants, and therefore were excluded. This may have resulted in underestimation or overestimation of peer navigator acceptability. Finally, because peer navigator acceptability in this study was measured in the abstract, actual acceptability remains unclear and may be higher or lower.

Conclusions

Men of color who engage in HIV prevention efforts using PrEP may benefit from a peer navigator matched to their sexual orientation, race, and potentially other attributes. Men who are more psychologically vulnerable may also be more likely to seek out peer navigation in efforts to prevent HIV. MSM who had higher incomes were less accepting of a peer

navigator, suggesting that offering peer navigation services to men with more means and greater access to care should not be a high priority. Clinics or organizations wishing to implement PrEP peer navigation programs for Black and Latinx MSM may want to consider the utility of matching peers to participants by sexual orientation and race/ethnicity, as well as screening for sexual stigma and depression. Psychologically vulnerable MSM may have a greater need for a peer navigator in efforts to scale up HIV prevention efforts surrounding PrEP. Peer navigation surfaces should be incorporated into a suite of options for the engagement and prevention of HIV among minority MSM. Furthermore, men with recent STI diagnoses and high sexual stigma scores may be appropriate targets for peer navigation to prevent HIV and other sexually transmitted infections.

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Appendix

Table 1. Comparison of Black and Latinx MSM

Variable	non-Latinx Black n = 32 (N, % or median, IQR)	Latinx n = 63 (N, % or median, IQR)	P-value
Sociodemographic factors			
Sexual orientation			<0.001
Gay	15 (47)	54 (86)	
Straight	2 (6)	0 (0)	
Bisexual	13 (41)	6 (9)	
Queer	2 (6)	3 (5)	
Age (years)	42.5 (30-54.5)	29 (25-34)	0.001
Education			0.06
<high school	4 (13)	3 (5)	
high school	8 (25)	7 (11)	
some college	15 (47)	26 (42)	
college	3 (9)	19 (31)	
graduate school	2 (6)	7 (11)	
Insured (yes)	29 (91)	42 (67)	0.01
Income			0.32
$0-$1500	18 (56)	28 (45)	
$1501-$3500	6 (19)	21 (33)	
>$3500	8 (25)	14 (22)	
Foreign Born (yes)	2 (6)	30 (48)	<0.001
PrEP			
Currently taking PrEP (yes)	8(24)	25(40)	0.18
Interested in taking/continuing PrEP Yes	16 (50)	43 (68)	0.08
No	13 (41)	12 (19)	
Maybe	3 (9)	11 (13)	
Mental health			
Stigma score	8 (3-12)	11 (8-14)	0.004
PHQ-9 score	7 (3-10)	7.5 (4-12.5)	0.16
DAST score	1 (0-6)	1 (0-2)	0.13
AUDIT score	5 (3-15)	5.5 (4-11)	0.98
Healthcare factors			
Regular medical provider (yes)	21 (66)	38 (60)	0.30
Disclosed sexual orientation to provider (yes)	13 (41)	34 (54)	0.01
Sexual health			
Tested for HIV	29 (91)	58 (92)	0.81
Time since last clinic visit (months)	3 (1-5)	2 (1-3)	0.30
Condomless anal sex with HIV negative man	15 (47)	50 (79)	0.001
Relationship with HIV+ partner	1 (3)	7 (11)	0.19
STI treatment in last 12 months	7 (22)	36 (57)	0.002
Use of PEP in last 12 months	2 (6)	16 (25)	0.02
Use of crystal meth	5 (16)	5 (8)	0.25
Use of poppers	8 (25)	27 (43)	0.09
Non-prescription IVDU	1 (3)	3 (5)	0.72
Exchange sex for drugs, money, housing	4 (13)	3 (5)	0.17
Any high risk HIV behavior	22 (69)	57 (90)	0.01
Importance of peer attributes			

Peer attributes ranked as important/very important			
Same sexual orientation	23 (72)	47 (74)	0.56
Same race	16 (50)	34 (54)	0.07
Same age	16 (50)	40 (63)	0.33
Same culture	13 (41)	28 (44)	0.35
Same neighborhood	9 (28)	27 (43)	0.17
Same income	7 (22)	21 (33)	0.14

Table 2. Regression analysis of factors associated with peer navigator acceptability

Characteristic	Unadjusted beta (95% CI)	P value	Model 1 (full multivariable): Adjusted beta (95% CI)	P value	Model 2 (limited multivariable): Adjusted beta (95% CI)	P value
Sociodemographic factors						
Race/ethnicity						
Latinx	0.30 (-0.13 to 0.72)	0.17	-0.03 (-0.54 to 0.48)	0.90	0.15 (-0.30 to 0.61)	0.51
Sexual orientation						
Gay	Reference		Reference		Reference	
Straight	-0.98 (-2.30 to 0.34)	0.14	-1.02 (-2.33 to 0.28)		-0.77 (-2.05 to 0.51)	0.32
Bisexual	0.04 (-0.46 to 0.55)	0.87	-0.04 (-0.57 to 0.49)	0.26	0.07 (-0.45 to 0.58)	
Queer	0.75 (-0.11 to 1.60)	0.09	0.56 (-0.36 to 1.48)		0.61 (-0.28 to 1.50)	
Age (years)	0.00 (-0.02 to 0.02)	0.98				
Education						
< High school	Reference					
High school	0.11 (-0.87 to 1.10)	0.30				
Some college	0.07 (-0.82 to 0.96)					
College	0.04 (-0.89 to 0.97)					
Graduate school	-0.67 (-1.71 to 0.38)					
Has health insurance	0.55 (0.11 to 0.99)	0.02	0.31 (-0.23 to 0.85)	0.30		
Monthly income ($)						
$0-$1500	Reference		Reference		Reference	
$1501-$3500	0.03 (-0.41 to 0.48)	0.001	0.05 (-0.42 to 0.51)	0.04	0.06 (-0.38 to 0.50)	0.02
>$3500	-0.80 (-1.26 to -0.34)		-0.59 (-1.09 to -0.10)		-0.62 (-1.10 to -0.14)	
Foreign-born	0.34 (-0.07 to 0.76)	0.10				
PrEP						
Currently taking PrEP (yes)						
Interested in taking/continuing PrEP	-0.31 (-1.30 to 0.69)	0.53				
Yes	Reference	0.25				
No	-0.37 (-0.83 to 0.09)					
Maybe	0.03 (-0.58 to 0.65)					
Mental health						
Stigma score	0.05 (0.01 to 0.09)	0.006	0.04 (0.00 to 0.07)	0.08	0.04 (0 to 0.08)	0.03
PHQ-9 score	0.04 (0.01 to 0.07)	0.01	0.02 (-0.01 to 0.05)	0.27		

DAST score	-0.02 (-0.10 to 0.06)	0.55				
AUDIT score	0.02 (-0.01 to 0.06)	0.17				
Healthcare factors						
Has regular medical provider	-0.63 (-1.03 to -0.23)	0.002	-0.29 (-0.75 to 0.16)	0.20		
Disclosed same-sex behavior to provider	-0.31 (-0.91 to 0.30)	0.32				
Sexual health						
Ever tested for HIV	0.37 (-0.37 to 1.10)	0.32				
Time since last clinic visit < 4 months 4 -12 months >12 months	 Reference -0.11 (-0.61 to 0.39) 0.05 (-0.71 to 0.81)	 0.89				
Reported condomless anal sex with a man in past 12 months	0.34 (-0.08 to 0.76)	0.11				
Currently in relationship with HIV-positive partner	0.20 (-0.54 to 0.94)	0.59				
Received STI treatment in past 12 months	0.27 (-0.13 to 0.67)	0.19				
Use of PEP in past 12 months	0.10 (-0.40 to 0.59)	0.70				
Any high risk behavior	0.45 (-0.09 to 0.99)	0.10				
Use of crystal meth in past 12 months	0.51 (-0.14 to 1.20)	0.12				
Use of poppers in past 12 months	-0.20 (-0.61 to 0.21)	0.34				
Non-prescription IVDU in past 12 months	0.54 (-0.42 to 1.50)	0.27				
Exchange sex for drugs, money, housing in past 12 months	0.45 (-0.34 to 1.24)	0.26				

Figure 1. Likert scale responses for each peer attribute

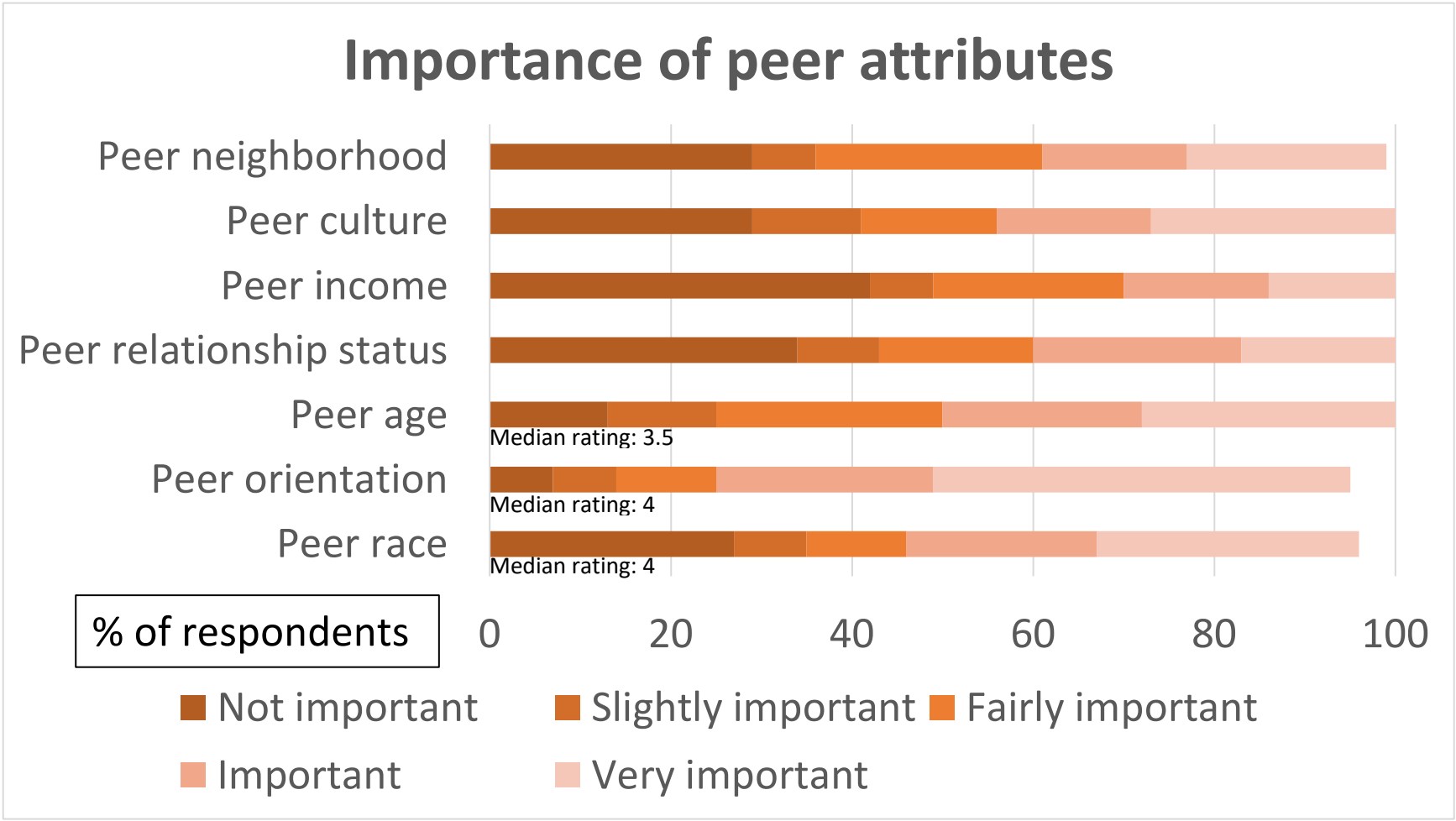
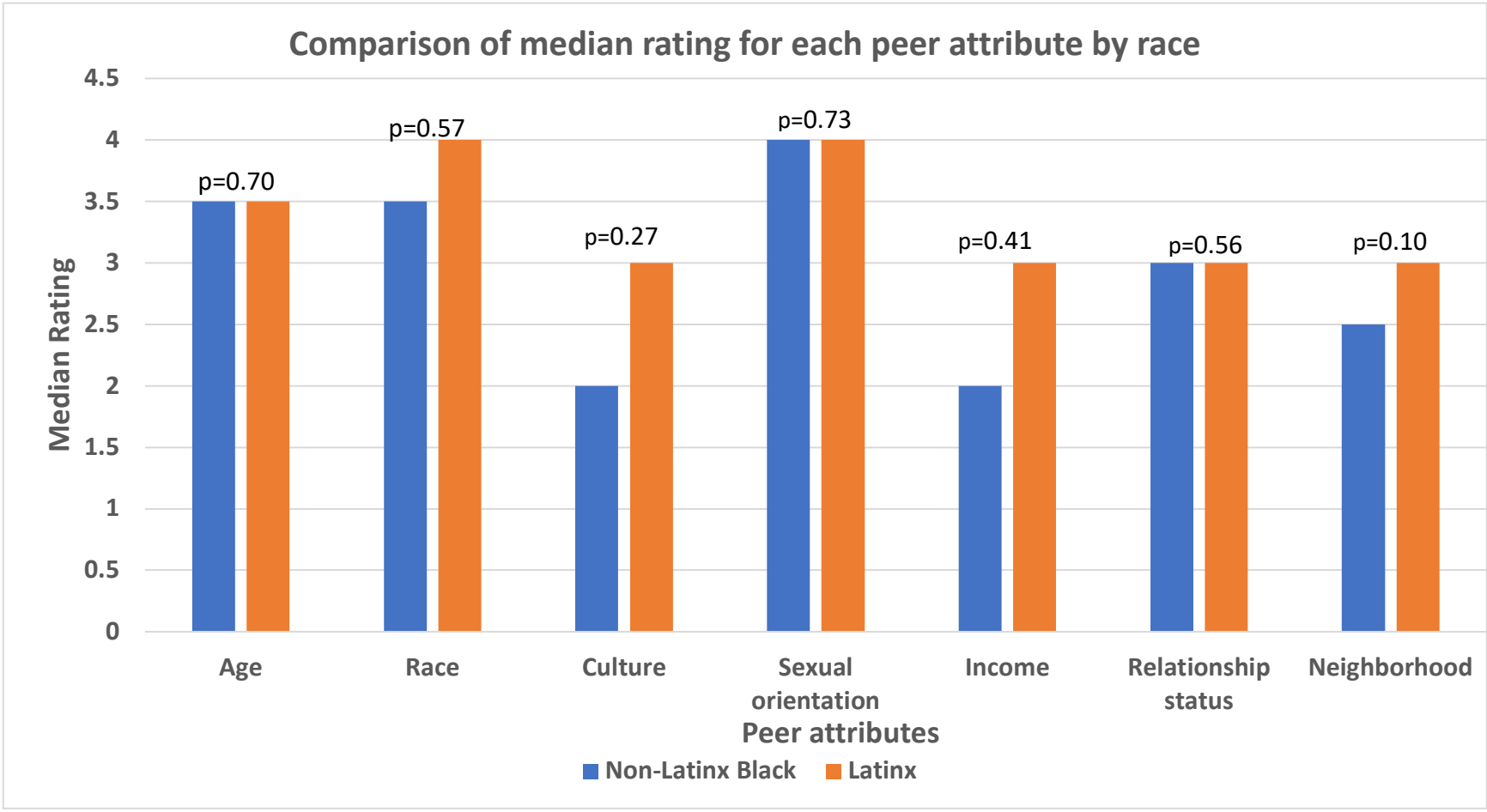


Figure 2. Comparison of median rating for each peer attribute by race/ethnicity



Likert scale: (1) Not important (2) Slightly important (3) Fairly important (4) Important (5) Very important

P-values calculated using the Wilcoxon rank-sum test.

Table 3. Correlation of peer characteristic rating with peer navigator acceptability

Characteristic	Spearman correlation (ρ)	P-value
Same age	0.29	0.01
Same race	0.27	0.01
Same culture	0.35	0.0008
Same orientation	0.30	0.01
Same income	0.20	0.08
Same relationship status	0.20	0.07
Same neighborhood	0.34	0.001

Figure 3. High risk sexual behavior and PrEP interest

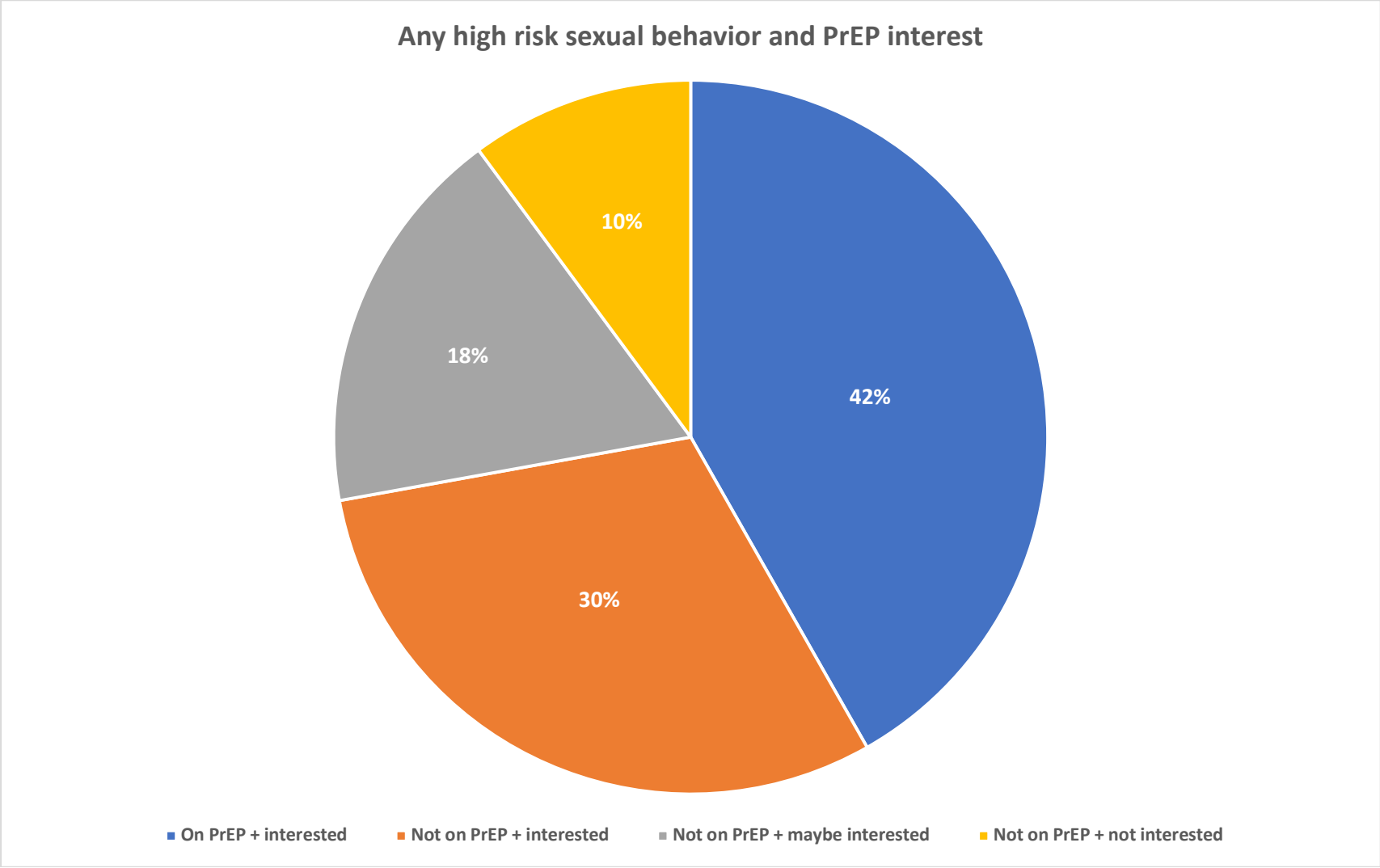
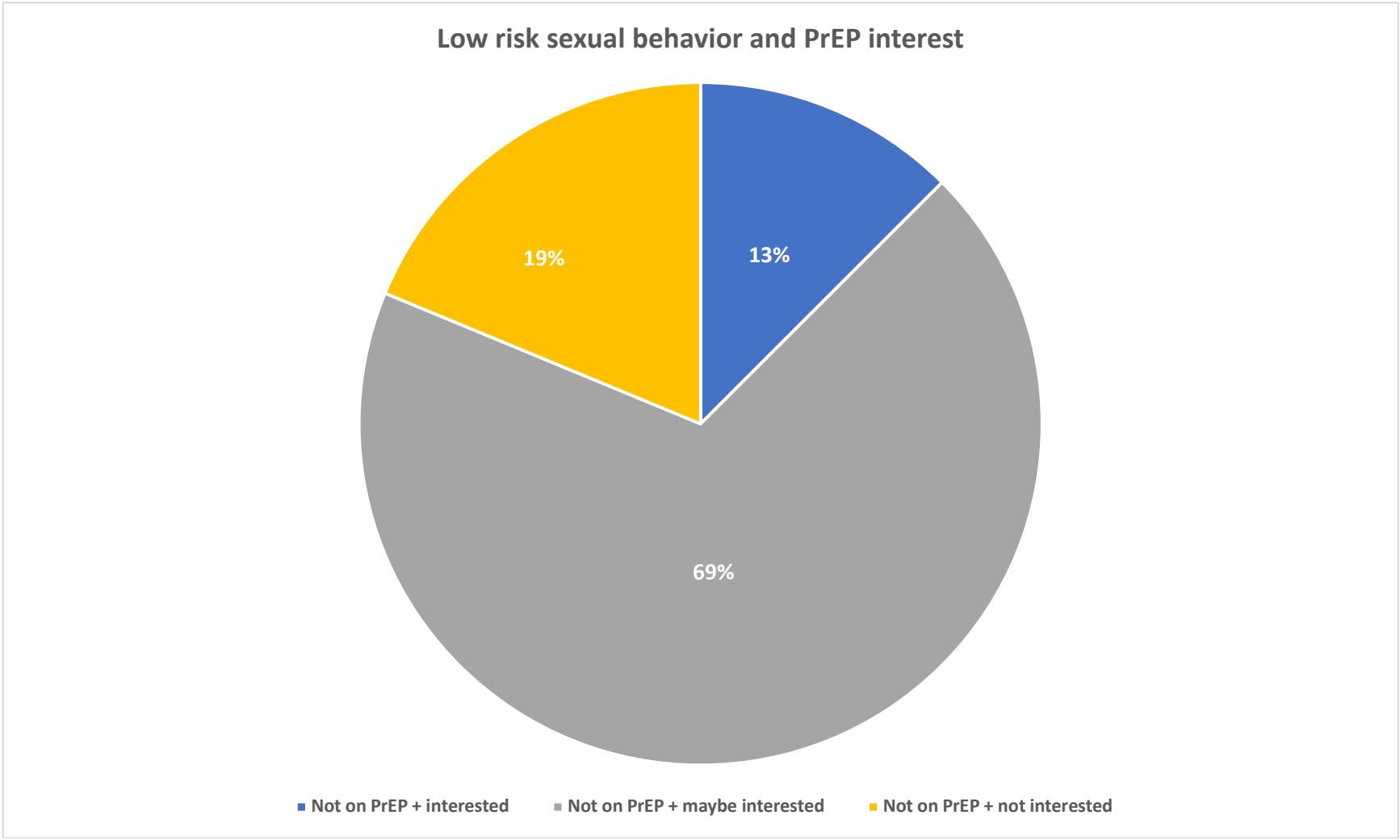


Figure 4. Low risk sexual behavior and PrEP interest



*None of the individuals with low risk sexual behavior reported being on PrEP