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Identifying Key Factors to PrEP Initiation and Persistence among YMSM through Focus Groups and Surveys in Two High Priority Settings

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Abstract

Cisgender men are diagnosed with HIV at a rate four times greater than cisgender women, with 71% of infections attributed to male-male sexual contact. Despite expanding accessibility, pre-exposure prophylaxis (PrEP) for HIV prevention is initiated by only 30% of people with PrEP indications. Five focus groups with 42 young men who have sex with men from New York and Alabama were conducted to identify key factors to PrEP initiation and persistence. Thirty focus group participants completed a survey on demographics, PrEP choices and healthcare attitudes. Findings suggest provider competency significantly influences PrEP use due to stigmatization in medical settings. Participants noted benefits of PrEP including HIV protection and sexual empowerment, yet barriers like cost and side effects were prevalent. Our findings outline barriers and facilitators to PrEP use among young men who have sex with men in two high priority settings that will inform PrEP care updates in participating clinics.

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Keywords

PrEP; HIV; Young men who have sex with men; Focus groups

INTRODUCTION

Cisgender men are diagnosed with HIV at a rate of about four times greater than cisgender women, with about 71% of HIV infections attributed to male-male sexual contact (CDC, 2023). Further disparities exist between racial and ethnic groups, as the HIV incidence rate in Black men is eight times greater than White men and nearly two times greater than Latinx men (CDC, 2021a). Between January and June of 2023, approximately 76.6% of HIV diagnoses were among people aged between 13 and 44-years old, suggesting a need for interventions targeted toward younger populations (CDC, 2023). HIV pre-exposure prophylaxis (PrEP) is an effective and safe HIV prevention strategy with several PrEP regimens approved and recommended for use among men who have sex with men (MSM) (Grant et al., 2010; Landovitz et al., 2021; Mayer et al., 2020; Molina et al., 2015; Radix & Vail, 2021).

Daily oral PrEP pills were first approved for use in 2012 and long-acting injectable (LAI) PrEP was approved for use by the US Food and Drug Administration (FDA) in 2021 (CDC, 2021b). Clinical trials have also demonstrated HIV prevention efficacy of an on-demand (or 2-1-1) PrEP schedule that times doses of emtricitabine-tenofovir disoproxil fumarate (F/TDF) around sexual events among men who have sex with men (MSM) (Molina et al., 2015; Molina et al., 2022). Given PrEP's potential to curb HIV infections among vulnerable populations, it has been cited as a fundamental strategy in national initiatives such as Ending the HIV Epidemic (EHE) which aims to end the HIV epidemic in the United States by 2030 (Giroir, 2020).

The Centers for Disease Control and Prevention (CDC) estimates that 1.2 million people in the US have indications for PrEP (CDC, 2022). Despite expanding accessibility and an increasing number of PrEP options, PrEP use remains low among racial minorities. Additionally, adolescents and young adults had the greatest unmet need for PrEP among all age groups in 2021 (AIDSVu, 2022). Previous PrEP studies have identified pervasive socioeconomic barriers that limit access to PrEP for vulnerable populations, such as stigma, high costs, side effect concerns, medical mistrust, low PrEP awareness or misinformation about PrEP, and a lack of perceived need (Corneli et al., 2022; McKetchnie et al., 2023; Spieldenner et al., 2022; Watson et al., 2022; Wiginton et al., 2022) However, most of this data was collected through surveys rather than focus groups which have added advantages such as greater candor from participants (Leung & Savithiri, 2009).

In this mixed methods study, we aimed to identify key factors to PrEP initiation and persistence among MSM in two high priority regions, New York, New York (NYC) and Birmingham, Alabama (AL), as identified in the EHE plan (HIV.gov, 2023). Preliminary 2023 CDC PrEP data shows that in New York, approximately 44.4% of people with PrEP indications were prescribed PrEP (CDC, 2023). Alabama only had about 21.9% PrEP coverage (CDC, 2023).

We conducted focus groups with young cisgender MSM [YMSM] (k=5, n=42) and collected survey data (n=30) to better identify barriers and facilitators to PrEP uptake and persistence, and motivating factors for individuals to support implementation of HIV prevention activities. Information gathered from the focus groups and surveys will help inform site-specific knowledge and implementation of mChoice, a study with a mobile health (mHealth) intervention to support PrEP use and describe factors relating to PrEP choices among MSM in NYC and AL.

METHODS

Recruitment

Focus group participants were recruited via advertisements posted in sexual health clinics located in New York, NY and Birmingham, AL and through outreach calls made to participants who previously expressed interest in future research participation opportunities at the Columbia University School of Nursing in NYC. Additionally, advertisements were placed on social media channels with geotargeting to NYC and AL. To determine eligibility, participants either filled out a screener online or were screened by phone. Eligible participants 1) were between the ages of 18-39 years; 2) identified as cisgender male; 3) reported sexual activity with another man in the previous six months; and 4) self-reported negative or unknown HIV status. Participants signed e-consent through Research Electronic Data Capture (REDCap), a secure electronic data-capture system, with the opportunity to ask study staff any questions prior to participating in the focus group sessions. Participants were enrolled once consent was signed.

Implementation

Focus groups were conducted using secure HIPAA compliant Zoom technology and were audio-recorded for transcription. A total of five focus groups were held with an average of eight participants per group (range: 4-12). Each focus group was approximately 1.5 hours long. A single facilitator (PD) moderated each focus group using a semi-structured focus group guide, with open-ended questions intended to assess PrEP knowledge and experience, sources of PrEP information, barriers and facilitators to PrEP initiation and persistence, and factors that would encourage participation in a PrEP study. Participants received a $40 Amazon gift code as a token of appreciation.

Participants were also invited to complete a comprehensive survey following the focus group session. Focus group participants were contacted by email and text message to ascertain their interest in completing the survey and, if interested, sent a link to an e-consent form for the survey. Upon providing consent, participants were sent a link to a 30-minute online survey which gathered information about the participants' PrEP use/practices, utilization of healthcare services for PrEP, and associated beliefs and attitudes. A total of 30 focus group participants completed the survey and received a $30 Amazon gift code as a token of appreciation. The rest of the focus group participants (n=12) either did not respond or were not interested in completing the survey.

Focus Group Analysis

Following transcription, four members of the research team reviewed transcripts (PD, SS, MB, and SK). An initial codebook was developed guided by the Health Belief Model (HBM), which has been used to understand HIV prevention behaviors in prior studies (Felsher et al., 2018; Nwogwugwu et al., 2019). The HBM is a theoretical framework developed to explain an individual's engagement in preventative health behavior (Vincenzo et al., 2022). This framework hypothesizes that health-related action occurs according to three factors: 1) existence of sufficient motivation or health concern; 2) perceived vulnerability of a health problem; and 3) perceived benefit of preventative measures (Rosenstock et al., 1988). HBM codes were modified to align with themes of the focus group guide and refined iteratively until the codebook was finalized, resulting in the following codes: 1) modifying factors; 2) cues to action; 3) individual perceptions; 4) barriers; 5) facilitators; and 6) self-efficacy. The four reviewers independently coded each of the five focus groups using deductive content analysis and met to compare and synthesize definitions, examples, and sub-categories (Elo & Kyngas, 2008). Having multiple coders increases trustworthiness of the analysis (Morse, 2015).

Survey Data Analysis

The survey data was analyzed descriptively. In addition to sociodemographic data, the survey also included items to assess attitudes toward the healthcare system, such as level of comfort discussing different topics with healthcare providers using a scale created by Dr. Lisa Hightow-Weidman's research team (not yet published), history of HIV and STI testing, PrEP use and attitudes, using the PrEP difficulties scale, preferences regarding PrEP options, and PrEP persistence (Budhwani et al., 2022).

Ethics

This study was reviewed and approved by the Columbia University Institutional Review Board and the procedures followed were in accordance with the Helsinki Declaration as revised in 2013. The participants provided their written informed consent to participate in this study.

RESULTS

A total of 42 YMSM participated in focus groups. Of those 42, only 30 completed the survey for additional compensation. The majority of focus group participants (93%) were from NYC. Only 7% of participating YMSM were from AL. Most survey respondents identified as gay (76.7%) and never married (86.7%). Most were employed full-time (53.3%), had completed secondary or college-level education (63.3%), and had their own insurance (70%) with coverage through their own health plans (63.3%). Demographic and sociodemographic characteristics of respondents can be found in Table 1.

Prevalent themes from the modified HBM codebook included: 1) modifying factors; 2) cues to action; 3) individual perceptions; 4) barriers; and 5) facilitators. Although self-efficacy was included in our codebook, it was not found to be a common theme among the five focus groups and thus was not included in the results section. Table 2 presents major themes

with definitions and illustrative quotes from each thematic code. Survey responses provided context to focus group participants' PrEP experience as we found that although only 50% of respondents were currently using PrEP, most survey respondents (80%) had discussed PrEP with their provider in the last 6 months. The most common PrEP regimen currently used (40%) and ever used (70%) by participants was daily oral PrEP.

MODIFYING FACTORS

Comments about individual factors that influenced risk for acquiring HIV and/or the ability to engage in HIV prevention methods were coded under the theme of modifying factors. In general, survey respondents (85%) expressed low to moderate concern of HIV acquisition. Yet, factors such as sexual habits or behaviors and PrEP awareness led to engagement in PrEP care. Some participants indicated a correlation between a changing number of sexual partners and starting or stopping PrEP, and described PrEP as a way to remain protected against HIV while sexual activity may be unpredictable.

> "*I would say I usually would stay on PrEP during like a certain season…I would definitely say that I try to stick to a schedule because I don't know when I might have sex. It might be like really sporadic, so I just try to remember to take it daily…taking it every day like when I'm in school and stuff, helps me keep that habit and makes me feel safer."* (FG1).

In addition to habits and behaviors as motivation for PrEP use, participants suggested that awareness of PrEP and its efficacy contributed to interest. Overwhelmingly, YMSM focus group participants demonstrated a high degree of PrEP knowledge and awareness. Some participants were able to accurately speak about comparative benefits of different PrEP medications and strategies, such as LAIs. Survey data demonstrates that 90% of respondents had prior knowledge about daily oral PrEP, 63.3% about injectable PrEP, and 46.7% about intermittent oral PrEP (responses were not mutually exclusive).

CUES TO ACTION

Several critical "first step" opportunities for HIV prevention, namely for starting PrEP (initiation) or participating in HIV-prevention research, were mentioned in all focus groups and coded under the theme of cues to action. Items coded under the sub-theme of sources of PrEP information provided context as to where YMSM learn about PrEP. Medical settings, such as doctors' offices and clinics, participation in PrEP and sexual health research studies, ads from pharmaceutical companies and dating apps, high school and colleges classes, friends and partners were all mentioned as sources of PrEP information. The breakdown of avenues and sources of PrEP information was reinforced by survey responses. In particular, most participants indicated they got information from providers (80%), friends or relatives (30%), social media (23%), TV (20%), and a person they had sex with (17%) (responses were not mutually exclusive). When asked what would encourage them to participate in HIV-prevention research, participants stated that they viewed studies as a resource for further education on PrEP.

Although monetary incentives were noted as the primary driver for participation, some participants also mentioned that a benefit of study participation was the opportunity to contribute to research and understanding about PrEP use. One participant explained how the benefits of participating in a study may extend to others, "having a friend or family member that you know is sexually active, and you would want to ensure their safety" (FG4). These comments were categorized under the sub-theme of altruistic incentives.

Altruistic incentives were also coded as a driver to PrEP initiation, as several participants expressed a regard for others' health and safety when discussing PrEP use. Notably, one participant described this as an acknowledgement of the challenges encountered by an earlier generation, as they pertain to the consequences of HIV infection:

> "*As far as younger people taking PrEP, I don't know the numbers, I don't know how many younger people take PrEP. But I know, in the generation that I came up with, the consequences of HIV were quite visible to a generation that was very close to us. So, once you get further away from that, you kind of get this apathy that occurs in a younger generation. You sort of roll the dice so to speak. Now, that's really difficult to translate to a younger generation of people sometimes unless it personally affects them. So, I think the best way to really get someone to take PrEP is by really making it, in whatever form it takes, to have that personal attachment to it*" (FG2).

Additional reasons for PrEP initiation fell under the themes of individual perceptions and facilitators and were coded as such.

INDIVIDUAL PERCEPTIONS

Perceived susceptibility of acquiring HIV emerged as a relevant theme as it highlighted reasons for starting, continuing, or stopping PrEP. Participants felt they were at varying levels of risk (high or low) for HIV acquisition. Some believed they were at high risk due to factors such as having a sexual partner living with HIV. For these participants, PrEP was seen as a means of reducing anxiety surrounding sex.

> "*But it makes me feel a little safer knowing that I have a layer of protection against contracting HIV. I engage in sexual activity very regularly. And I like to know that that is something that I have protecting me*" (FG5).

Conversely, some participants stated that they were not taking PrEP due to circumstances which they believed decreased their risk for HIV acquisition, such as entering a monogamous relationship or abstaining from sex.

BARRIERS AND FACILITATORS

Identified obstacles that inhibit a person's ability to start (initiation) or continue to take (persistence) PrEP were coded as barriers. Common barriers to PrEP initiation and persistence were cost, side effects, lack of knowledge or awareness, access, and stigma. Participants who were at some point uninsured shared that PrEP was too expensive and others had to discontinue PrEP at some point due to an insurance change. While 93% of

survey respondents reported they were currently insured, 53.3% of respondents indicated that having to use insurance to get coverage for PrEP costs affected their decision to take PrEP.

Aside from financial barriers, side effects, or fear of side effects were a common barrier or a potential factor in decision making to PrEP initiation and persistence. This was also demonstrated in survey results where 70% indicated that side effects influenced their decision to take PrEP. These included both acute, short-term effects that are typically encountered when starting PrEP, as well as potential long-term side effects from prolonged use. For some, fear of side effects outweighed potential benefits of PrEP. Reluctance to start PrEP was also due to lack of understanding of how PrEP worked.

Despite interest in PrEP, access and stigma can inhibit patients' uptake and persistence to PrEP. Participants discussed how accessing the services needed to authorize PrEP prescriptions, such as testing, created a barrier that sometimes resulted in delayed PrEP refills. Survey responses indicated that PrEP follow-up appointments influenced 33% of participants' decisions to take PrEP. One participant noted that geography can present a barrier; such as in remote regions with fewer PrEP prescribers, however, they suggested that recent "PrEP-by-mail" services may be effective at overcoming this barrier. Ultimately, stigma emerged as one of the most notable sub-themes. Sources of this stigma varied. One participant noted that, while unfounded, concerns that one will be perceived as having HIV while taking PrEP persist.

> "*Well, I mean, I think is the idea of being seen as taking a pill that people might think…that you might have...HIV, because the medicine is…very similar. And again, there should not be a stigma about having HIV, but, you know, it still exists because of long history"* (FG3).

Another participant noted potential stigmatizing encounters with healthcare providers. Particularly, they highlighted the antiquated and stigmatizing medical diagnosis that may be used by prescribers.

> "*…but I watched as my doctor was like, initially trying to prescribe me PrEP, and he put in—what is it—like the diagnosis was like at-risk homosexual behavior or something…Like this was really awful"* (FG3).

Several sub-themes were coded as both a barrier and facilitator; the most significant being provider competency, or the level of respect displayed towards a person by a licensed provider. Similar to stigma, comments coded under the sub-theme of provider competency demonstrated delayed progress in terms of PrEP provision and knowledge among providers. Participants shared frustration with providers who made assumptions about their sexuality, were not educated about PrEP, and generally had poor bedside manner.

> "*I had a doctor who was really pushy and trying to get me to go on PrEP when I told him that I am with a partner and I'm not actually having sex with other people. So I really don't need it. And that actually put me really off from getting on PrEP. And so I think understanding that each patient's individual circumstance*

and tailoring that experience for the patient is really important. Like you can't just expect everyone to take PrEP" (FG3).

Focus group participants who responded to the survey reported a moderate level of certainty when answering questions related to discussing sexual activity and working out differences with their providers. When asked about their level of comfort discussing sexual activity openly with their healthcare providers, 50% of the survey respondents expressed that they were unsure to moderately sure in their ability to do so. A similar spread of responses was noticed when participants were asked about level of comfort in navigating differences that arose during provider visits.

Conversely, some participants described provider competency as a factor that promoted their ability to initiate or persist on a PrEP regimen, which was coded under the theme of facilitator. Support from providers who were non-judgmental and well-versed in PrEP provision was seen as one of the most important factors for PrEP initiation and persistence by participants.

"*...If you disclose to your doctor like oh, I'm gay, you know, just for medical reasons, and they are aware enough or educated enough about PrEP and other things, it would be nice just to have the option disclosed to you. You know, obviously, it's a choice at the end of the day, but it would be very nice to have a person who's educated enough to know that this is something that could benefit you*" (FG3).

Additionally, providers with similar identities to their patients were well-regarded: *"I get mine through my primary care who luckily is an older gay man so that made it very easy to ask him about it. Then, he prescribed it with no hesitation. It was a really great experience in that way"* (FG1).

Another sub-theme that was coded as both a barrier and facilitator was medical trust. Participants reported reluctancy to use PrEP because of poor experiences with providers and a general mistrust of the healthcare system due to experienced judgment by medical professionals. However, others stated that they had trust in the healthcare system which positively contributed to PrEP initiation and persistence.

Finally, the most frequently cited benefit of PrEP was protection against acquisition of HIV. Participants expressed feelings of security and ease of mind knowing that PrEP has a high efficacy in protecting against HIV. Some also mentioned they felt PrEP was a more effective form of protection than condoms. One participant thought of PrEP as "*wear[ing] a seatbelt"* (FG5). Participants felt that PrEP protected them and, consequently, contributed to sexual empowerment and liberation. PrEP was seen to reduce sex-related anxiety and to feel empowered when engaging in sexual activities.

DISCUSSION

HIV protection, sexual empowerment and perceived high susceptibility to HIV acquisition were identified as facilitators to PrEP uptake among focus group participants. Participants described that being patients of providers who were non-judgmental and well-versed in PrEP

provision was a key factor in their decision to start and adhere to PrEP. Many participants described a feeling of security knowing that PrEP has a high efficacy in protecting against HIV. This contrasted with an earlier national study of adolescents MSM who did not think that PrEP was very effective at preventing HIV without a condom (Gordián-Arroyo et al., 2020).

Other the other hand, several barriers to PrEP use persist. prevalent. Barriers such as side effects, cost, mistrust, and stigma have been noted in prior studies (Spieldenner et al., 2022; Watson et al., 2022; Wiginton et al., 2022). It is surprising that cost continues to be a common barrier when resources such as Ready, Set, PrEP exist for those who don't have health insurance coverage for prescription drugs (Services, 2023). This is especially noteworthy given that most participants (93%) were from NYC, a densely populated area with presumably easy access to these resources. This may be due to the fact that while most survey respondents had health insurance (93.3%), 53.3% of respondents indicated that having to use insurance would influence their decision to use PrEP.

Provider competency was frequently discussed across all focus group sessions. Studies have shown that while primary care providers have the potential to encourage PrEP use among patients, many do not feel comfortable discussing sexual activity with patients or lack sufficient knowledge on PrEP (Petroll et al., 2017; Storholm et al., 2021). An online survey found that only 28% of the 525 PCPs surveyed felt familiar with prescribing PrEP (Petroll et al., 2017). This data is reinforced by focus group participants who were stigmatized by their providers, such as the one participant whose provider created a false diagnosis of "*at-risk homosexual behavior"* as a result of his sexuality. Among all five focus groups, participants emphasized the importance of having a competent provider when it comes to starting or continuing a PrEP prescription. They expressed continued frustration with having to educate their providers on newer PrEP modalities. Stigmatization in a medical setting leads to larger issues such as medical mistrust, which was a common theme among participants.

This mixed method study was conducted within the context of the mChoice Study (U01PS005229) which will implement a provider training designed to provide PrEP clinical guidelines to clinicians and highlight the importance of cultural humility in PrEP care. The provider training will be delivered to providers from four participating clinics located in NYC and Birmingham, AL via an electronic learning tool. Each provider training module will include pre- and post- training assessments and situational judgement or clinical cases for enhanced learning. Focus group findings related to provider competency and perceived stigma support the need for implementation of this provider training module.

As most participants were from NYC, perceptions of stigma and provider lack of knowledge related to PrEP care demonstrate a dated approach to healthcare delivery in NYC despite being situated in a politically progressive city and state. It is critical to highlight the significance of these barriers discussed in focus groups, as they indicate that HIV-negative people struggle to adhere to medication, even with knowledge and awareness of the benefits of PrEP.

Limitations

Although our study outlines important facilitators and barriers to PrEP uptake, there are limitations. The participants in our study were primarily White, non-Hispanic or Latino, and belonged to middle and upper socioeconomic classes. Thus, our results fail to accurately capture any barriers or facilitators to PrEP initiation and persistence that might be specific to YMSM from racial and/or ethnic minorities and lower socioeconomic classes, populations that are disproportionately affected by the HIV epidemic. Additionally, as 70% of participants who completed the survey indicated having their own insurance, and 63% being covered by a private health plan, it is important to note that barriers and facilitators to PrEP uptake and persistence may not be as well understood in a relatively high-income population that has reasonable access to PrEP. More specifically, we were not able to understand factors significant to PrEP initiation and persistence among people who do not have insurance.

The percentage of participants from Birmingham (~7%) who participated in focus groups is too minimal to identify region-specific commonalities and reach larger conclusions about PrEP understanding in the South. This is a limitation because CDC 2023 statistics demonstrate a PrEP coverage rate in AL to be about half of the rate in NYC and thus barriers and facilitators may be different in the two settings. Future studies may consider implementing enrollment restrictions based on race/ethnicity and geography to better facilitate the identification of culture-specific themes pertaining to PrEP uptake and use.

Given the low sample size for survey responses, we were unable to draw any significant relationships from our findings . Future studies should consider using a larger sample size if they intend to draw relationships among responses. Additionally, we were unable to compare focus group responses to survey responses. Meaning we did not know if individuals who made contributions during the focus groups were currently taking PrEP or not. Future studies may consider administering the survey to participants prior to them engaging in the focus groups to help increase the sample size for survey respondents and enable comparison between survey and focus group responses.

CONCLUSION

In summary, findings from this study demonstrate use of a modified Health Beliefs Model framework and survey results to better understand barriers and facilitators associated with PrEP use among YMSM in NYC and AL. Factors identified in this mixed methods study contribute significant findings to the PrEP and sexual health research community. Future research is needed to address barriers and facilitators specific to YMSM from different racial, ethnic, and geographical backgrounds. Our findings will enable us to better tailor an interventional study to improve YMSM PrEP adherence and provider PrEP care at four participating sites located in NYC and AL.

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Table 1.

Demographics and Socioeconomic Characteristics of Survey Respondents (n=30)

	N	%	Median	SD
Age (in years) *[a]*			27	3.75
Race*[a], [b]*				
African American or Black	7	23.3%		
American Indian or Alaskan Native	1	3.3%		
Asian	6	20.0%		
Native Hawaiian or Other Pacific Islander	0	0.0%		
White	17	56.7%		
Ethnicity *[a]*				
Hispanic - Mexican, Mexican American, or Chicano	2	6.7%		
Hispanic - Puerto Rican	0	0.0%		
Hispanic - Cuban or Cuban American	3	10.0%		
Hispanic - not listed	5	16.7%		
Not Hispanic or Latino	19	63.3%		
Sexual Orientation *[c]*				
Gay or Lesbian	23	76.7%		
Straight/Heterosexual	0	0.0%		
Bisexual	5	16.7%		
Something else	2	6.7%		
Don't Know	0	0.0%		
Marital Status				
Married	2	6.7%		
Living together as married	1	3.3%		
Separated	1	3.3%		
Divorced	0	0.0%		
Widowed	0	0.0%		
Never married	26	86.7%		
Don't Know	0	0.0%		
Employment Status				
Employed full-time	16	53.3%		
Employed part-time	5	16.7%		
Homemaker	0	0.0%		
Full-time student	4	13.3%		
Retired	0	0.0%		

	N	%	Median	SD
Unable to work for health reasons	0	0.0%		
Unemployed	5	16.7%		
Other	0	0.0%		
Don't Know	0	0.0%		
Highest level of Education				
Grades 1-8	0	0.0%		
Grades 9-11	0	0.0%		
Grades 12 or GED	6	20.0%		
Some college, Associate's Degree, or Technical Degree	5	16.7%		
Bachelor's Degree	9	30.0%		
Any post graduate studies	10	33.3%		
Never attended school	0	0.0%		
Don't Know	0	0.0%		
Household Income *[c]*				
$0-$24999	10	33.3%		
$24999-$49999	6	20.0%		
$50000-$74999	4	13.3%		
$75000-$99999	0	0.0%		
$100000 or more	7	23.3%		
Don't Know	3	10.0%		
Health Insurance Coverage				
Current Health Insurance Coverage				
Own Insurance	21	70.0%		
Covered by parent/guardian	6	20.0%		
Covered by spouse/partner	0	0.0%		
No Insurance coverage	2	6.7%		
Don't Know	1	3.3%		
Type of Health Insurance[a],[b]				
Private health plan - through an employer or purchased directly	19	63.3%		
Medicaid	6	20.0%		
Medicare	0	0.0%		
Some other government plan	2	6.7%		
TRICARE/CHAMPUS	0	0.0%		
Veterans Administration coverage	0	0.0%		
Some other health insurance	0	0.0%		
Don't Know	1	3.3%		

[a] Sample size varies due to missing responses/data

[b] The total percentage sum can be greater than 100% as participants could select multiple options

[c] The total percentage does not equal 100% due to rounding of decimals

Table 2.

Major Themes Organized by the HBM, Definitions and Illustrative Quotes

Thematic code	Exemplar(s)
1. **Modifying Factors:** Refers to key factors specific to a person that influences their risk for acquiring HIV and/or ability to engage with HIV prevention methods	
(1.1) Habits/Behaviors	*I have noticed that I have been a lot riskier when I started taking PrEP, you know, like having a lot more unprotected sex, though I have been more self-selecting. I like sleeping with dudes who are either on PrEP or are undetectable, while I don't use as much protection, I'm definitely more self-selecting.* (FG1)
(1.2) PrEP Awareness	*I was going to say there's three different forms of PrEP currently out, I believe; Descovy, Truvada, and Apretude. Apretude is the newer version. Apretude is an injection. A lot of people usually start with the pills for 30 days, and then they'll get to the injection. The first two months, it's once a month. And then they'll take it once every month after, following. And some of the clinical trials for Truvada is showing to affect the kidneys more than Descovy.* (FG5)
(2.0) Cues to Action: Critical "first steps" related to people engaging in opportunities for HIV prevention, such as research or initiating PrEP – PrEP initiation is defined as beginning treatment using currently available PrEP options after meeting clinical guidelines	
(2.1.1) Sources of information – PrEP research	*Like I've seen posters or flyers at the gym. I've seen ads on Grindr or something. Or just by getting texts from previous studies.* (FG5)
(2.1.2) Sources of information – PrEP initiation	*I've gotten my information from going to my doctor and also talking with my friends about it. I've also gotten a lot of information by going to the sexual health clinic and getting different pamphlets and information from them as well.* (FG3)
(2.2.1) Resources – PrEP research	*I would participate to increase my knowledge about PrEP. So in case I get interested in wanting to take PrEP, just to expand my knowledge on it* (FG4)
(2.3.1) Monetary incentives – PrEP research	*Yeah. I think most people are motivated to like take a study—I mean, the nice way of saying it is people want to help other people, but I also think that there needs to be like some kind of like compensation that encourages people to do it. Because as generous as people can be, there's definitely a—you gotta push more because like something you're getting after.* (FG3)
(2.4.1) Altruistic incentives – PrEP research	*I think that something else that would kind of be an internal incentive for someone is like to have their—like different kinds of people who have different kinds of experiences being able to tell their stories, and having those documented as part of research, I think.* (FG3)
(2.4.2) Altruistic incentives – PrEP adherence/persistence	*Why I continue using PrEP? Because I feel safe. It's a pill, but it's protecting me from… I'm not saying that people that have HIV doesn't live long, because they do. HIV is not a bad thing, but it's also something that we don't want an increase of people getting.* (FG4)
(3.0) Individual Perceptions: Refers to individual judgements of the risk of acquiring and level of burden associated to living with HIV	
(3.1.1) Perceived susceptibility – High risk	*Well honestly, I don't want to get HIV. That should be good enough, but also, my partner is HIV positive. And, I want to be able to enjoy sex without having to use a condom. I haven't used a condom in, I don't know, a decade now.* (FG2)
(3.1.2) Perceived susceptibility – Low risk	*I used to be on it, but then I stopped when I got into a monogamous relationship.* (FG1)
(4.0) Barriers. Obstacles that inhibit a person's ability to initiate PrEP or persist on PrEP – PrEP persistence is defined as compliance with all aspects of recommended PrEP care including medication persistence and follow-up visits/testing	
(4.1.1) Cost – Initiation	*I'm not currently on PrEP. And it's kind of because I'm not insured. I suppose with insurance, since I know it can be expensive for some people. That would encourage me to start PrEP.* (FG2)
(4.1.2) Cost – Persistence	*Honestly, the only thing that I had a problem with and I had to stop taking PrEP, it was because you know, all of a sudden I changed, you know, I had a different job and I didn't have insurance anymore and I couldn't take PrEP anymore. But other than that, it has been pretty straightforward.* (FG2)
(4.2.1) Stigma – initiation	*So, what I wanted to say is basically to remove—there's a stigma that exists about taking PrEP. Like, I mean, I think it's especially big in men that have sex with men, but in any, you know, anybody should be able to really take PrEP if, you know, that way they feel a lot more protected.* (FG3)
(4.2.2) Mistrust – Initiation	*And I think, you know, like even going to the pharmacy, it feels a little bit like awkward to ask for that prescription. The pharmacist is going to look at me, and especially if you are in a small place. You know, it's all of that. That you don't feel really safe of saying I'm taking PrEP as I could be taking any other medication.* (FG3)
(4.4.1) Lack of knowledge/ awareness - initiation	*I have never taken PrEP before. And I think part of my curiosity in getting involved in this study is because I thought maybe I could learn more information about it…So I think the only thing that's stopping me is the*

Thematic code	Exemplar(s)
	lack of knowledge and just knowing where to go, what to do, how much it costs. But I definitely am open to it (FG5)
(4.5.1) Side effects – initiation	*I take PrEP myself. But I'm going to talk about why other people might feel scared taking it is because the way that sometimes the doctors explain it to you. They say it's going to protect you from HIV, but it might affect your liver and it might affect this and it might affect other issues, health conditions. And when you hear other health conditions that it can affect by you taking the medication, it's like something that makes you run away, like; no I shouldn't take this or I prefer just not taking it.* (FG4)
(4.5.2) Side effects – persistence	*When I've been in a relationship, I actually stopped taking it because this could be just psychosomatic, but I was very nervous about the long-term effects of my health, on my kidneys, specifically. A lot of that kind of getting into my head. I'm on it now, but that idea still exists.* (FG2)
(4.6.1) Access – initiation	*Also, I think there's like geographical issues. If you're not close to like a pharmacy or like all that. So, I feel like—I don't know—there should be like a mail option for some people. I don't know if you can get it by mail or not, but it should be like—I don't see why it's—I feel like it's like if you don't have like a provider, you're not like doing that, it's definitely not as easy as it was for me for some people.*
(4.6.2) Access – persistence	*I've been on PrEP since 2021, off and on. Partly, some of my provider just not sending it at times, or just not always having the time to get tested. Hmm. Yeah, that's about it.* (FG5)
(4.8.1) Provider competence – initiation	*I wish my healthcare providers knew more about other options when it comes under the PrEP umbrella. I remember it always felt like with each new wave of medications coming out, I had to educate my doctor on what they were going to look into, rather than them telling me; hey, there's a new option.* (FG3)
(4.8.2) Provider competence – persistence	*But I found a lot of resistance and even just general lack of knowledge in the medical field. Like I remember going to urgent care less than a month after I first started. And they were like; why are you on this medication if you're not positive? Just I mean I think education has grown leaps and bounds since 2014. But even then, it just felt like there a lot of misinformation out there* (FG5)
(5.0) Facilitators. Refers to factors that promote a person's ability to initiate PrEP or persist on PrEP	
(5.1.1) HIV protection – initiation	*But my original reason for taking [PrEP], since I haven't been for the past year or so, is like what a couple of other people are saying. It's peace of mind. Like you really can't trust people. Like I wear a seatbelt because I don't know what other people on the road are going to do. And it's sort of a similar thing. It's like an extra precaution that you take because you don't really know what other people have going on.* (FG5)
(5.1.2) HIV protection – persistence	*It protects me from HIV. But a lot of people think that it protects me from everything else. No, it's not really protecting you from anything else. It's just protecting you from HIV. And so the good thing is that I take it, because you never know when condoms can break. So you can never trust that. So that's why I take PrEP.* (FG4)
(5.2.2) Sexual empowerment/ liberation - persistence	*I feel like since I started taking it, I feel like my energy surrounding how I engage with sex became less anxiety-driven. Just I've had way too many experiences that either sent me into either a guilt … I mean obviously, of course, there's so many STIs you can encounter with sex. And I always have to try to remind myself that I still have to get tested regularly and I still have to kind of like make mindful choices. But I feel much more, having that routine and having that layer of; I am taking something preventative, and working that into my daily life* (FG5)
(5.5.1) Medical trust – initiation	*I don't really feel skeptical about any of the [PrEP] information that I get. Everything seems to be pretty well-researched and cited. I think before any decisions, though, I always like talk about it with my doctor. So, I always have a trusted source before I make any kind of decisions.* (FG3)
(5.9.1) Provider competence – initiation	*I really enjoy it when the person has a good bedside manner. I want somebody who is educated, of course, in all forms of STI, and also somebody who is understanding that human beings are going to do what human beings do, you know. You don't want them looking down on you and saying, like, oh well, here it is again. You know, so more or less just someone who is very understanding would be nice.* (FG2)
(5.9.2) Provider competence – persistence	*Yes, I mean we kind of talked about this earlier, but I specifically like my provider because he is gay and he understands, and so there are some elements, as others have said, so I just don't have to explain. And, I also didn't have to navigate the weird territory of like macroaggressions. I've had friends who have told me horror stories about going to see their physician and them saying, like, yes, I've had sex with fifteen people in the last two months, and they're like, Jesus Crist! Fifteen people! You know, you really need to tone it down…* (FG1)