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Facilitators of PrEP Persistence among Black and Latinx Transgender Women in a PrEP Demonstration Project in Southern California

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ABSTRACT

Black and Latinx transgender women in the United States (U.S.) are at disproportionately high risk for HIV. Although HIV pre-exposure prophylaxis (PrEP) reduces the risk of HIV infection, uptake and persistence (i.e., ability to continue taking PrEP over time) can be a challenge for Black and Latinx transgender women due to myriad social and structural forces. In this qualitative study, we present unique data on the facilitators of PrEP persistence from Black and Latinx transgender women who initiated PrEP and exhibited varying levels of persistence during a demonstration project in Southern California. PrEP persistence was assessed by collecting quantitative intracellular tenofovir-diphosphate (TFV-DP) levels on dried blood spot (DBS) samples collected at weeks 12 and 48. Informed by the socioecological framework, we conducted and analyzed interviews using qualitative content analysis to determine themes on the facilitators of PrEP persistence. Individual-level facilitators included the use of reminders, having high individual-level HIV risk perception, feeling empowered to take PrEP, and reporting having improved peace of mind and mental health because of taking PrEP. Interpersonal/Community-level facilitators included feeling motivation to prevent HIV in the community, motivation to prevent HIV in the context of sex work, and having high community-level risk perception. Structural-level facilitators included having positive experiences in affirming healthcare settings and having PrEP visits combined with other gender-related healthcare visits. Interventions aiming to increase PrEP uptake and persistence among Black and Latinx transgender women in the U.S. should harness the multiple levels of support exhibited by those who were able to start and persist on PrEP in the face of the myriad social and structural barriers.

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Introduction

Human immunodeficiency virus (HIV) prevalence rates among transgender women (TGW) are much higher than in the general population of adults in the U.S. (18.4%-30.6%^{1,2} vs. 0.3%-0.4%),³ with the odds of becoming HIV-positive estimated to be 34 times higher for TGW than for other U.S. adult populations.¹ HIV prevalence is especially high among racial/ethnic minority TGW, with an estimated 44% of Black TGW and 26% of Latinx TGW living with HIV as compared to 7% of White TGW.^{2,4-10} This high HIV prevalence has been attributed to the oppression, stigmatization, discrimination, harassment, violence

victimization, and economic oppression Black and Latinx TGW face.¹¹⁻¹⁴ Structural barriers to employment, legal recognition, housing, income security, and affordable healthcare, and lack of gender-affirming healthcare are examples of systematic inequality linked to increased behavioral risk for HIV and reduced engagement in protective behaviors among TGW.^{1,15-21}

Although HIV pre-exposure prophylaxis (PrEP) significantly reduces the risk for HIV transmission,²² uptake is low among TGW of color²³ due to a multitude of factors, including intersectional stigma and discrimination at the structural, community, and individual levels.²⁴ Rates of PrEP uptake and persistence (i.e., ability to continue taking PrEP over time) lag

behind other sexual and gender minority groups, with only about 17% of PrEP-eligible, Black and Latinx TGW reporting PrEP use.^{24,25} Moreover, TGW of color report high levels of medical mistrust,^{26–28} which is negatively associated with engagement in HIV prevention services such as PrEP.^{14,26,29–36} Previous studies also suggest that gender-related stigma and discrimination, and early PrEP marketing campaigns that predominantly targeted sexual minority men are likely contributing factors to the observed lag in uptake of PrEP among TGW of color.^{14,37,38}

Socioecological frameworks posit that individuals exist within larger systems (e.g., microsystem, mesosystem, exosystem, and macrosystem) and these higher level systems directly influence individual behavior.³⁹ Consistent with findings from previous studies,^{40,41} we previously found barriers to PrEP uptake and persistence that spanned multiple individual, interpersonal, community, and structural socioecological levels among Black and Latinx TGW.¹⁴ These barriers included concerns about the cost of the medication and accompanying labs, concerns about possible side effects or drug-hormone interactions, having mental health or substance use issues, lack of support from intimate/romantic partners, having problematic past experiences with providers and in healthcare settings, and experiencing community-level stigma around taking PrEP. In addition, salient structural barriers included unreliable transportation, lack of employment, and housing insecurity.¹⁴

Historically, HIV prevention research has conflated sexual minority men with TGW,^{11,40} creating a gap in our understanding of the specific HIV prevention needs of TGW.^{11,42,43} In particular, there has been a dearth of work examining the facilitators of PrEP persistence among TGW of color. Existing risk-reduction approaches demonstrate the importance of focusing on the facilitators of HIV prevention engagement among TGW such as increasing community and family support, having culturally appropriate and welcoming services and providers, and promoting resilience.^{44–46} Much of the prior HIV prevention literature written on TGW of color has focused on individual- and community-level deficits, which can serve to further marginalize and stigmatize these women. To date, the facilitators that empower TGW of color to begin and remain persistent on PrEP have been largely unstudied and are likely vital to the development of trans-centered PrEP programming. Understanding the unique, asset-based facilitators of PrEP persistence among TGW of color may help inform future HIV prevention strategies that harness the vitality of resiliency and perseverance among this

population. In this study, we used a socioecological framework to guide the development of the interview protocol and thematic content analysis to investigate the multilevel facilitators of PrEP uptake and persistence among Black and Latinx TGW over the course of a 48-week PrEP demonstration project.

Methods

Parent study

The 23 participants in the current study were recruited from a larger PrEP demonstration project among trans and non-binary identified persons conducted by the California Collaborative Treatment Group (CCTG) (NCT3086200). The parent study sought to enroll a diverse cohort of trans and non-binary individuals into a large-scale PrEP demonstration project that engaged multiple large healthcare delivery organizations as research partners. The parent study randomized participants to assess whether individualized Text messaging for Adherence Building (iTAB)⁴⁷ with or without brief motivational interviews to encourage PrEP adherence in transgender individuals, improved PrEP adherence in transgender and non-binary individuals. Further methodology for the parent study has been reported elsewhere.¹⁴

Current study

The goal of this study was to gain a deeper understanding of the facilitators of PrEP uptake and persistence experienced among a sample of Black and Latinx TGW who had been provided tenofovir/emtricitabine (TDF/FTC) for PrEP as part of a larger demonstration project. Inclusion criteria for this sub-study included: 1) identifying as either a Black or Latinx TGW and 2) having completion of week 12 of the parent study when objective intra-erythrocytic intracellular PrEP drug levels were collected via dried blood spot (DBS) assay for all participants. Of the 23 participants recruited, 43.5% (n=10) were in the iTAB plus motivational interviewing condition and the remaining 56.5% (n=13) were in the iTAB alone condition. The condition participants were assigned to was unknown to the interviewer staff at the time of interview. While the barriers to PrEP uptake and adherence among these TGW of color have been previously published,¹⁴ we sought to gain further insight into the facilitators of sustained PrEP use over time (e.g., persistence) among those TGW who demonstrated protected levels of PrEP (i.e., 4 or more doses taken per week) at some point during the 48 week study. Semi-structured interview

questions focused on the supports that facilitated PrEP uptake and persistence (e.g., “please tell me about any experiences of support you have had from family or friends that helped to keep taking your PrEP each day;” “please tell me about what kinds of tools, programs or services have helped you to start PrEP and to take it every day”).

Data collection

From July 2018 through August 2019, 30 TGW (16 Latinx, 10 Black, and 4 mixed Black and Latinx race) participated in one-on-one, semi-structured interviews in either English (n=25) or Spanish (n=5) held in private offices of either the Los Angeles LGBT Center or the Family Health Centers of San Diego. Because the current analyses focused on the facilitators of PrEP use, 7 TGW were excluded from these analyses because the laboratory results indicated that their intra-erythrocytic intracellular PrEP drug levels did not reach protective levels at any assessment point where DBS were collected yielding a final sample of 23 (13 Latinx, 6 Black, and 4 mixed Black and Latinx race). Interviews lasted approximately one hour and were conducted by trained study staff who were members of the trans community and familiar to participants from their involvement in the parent project.

Interviewers followed a semi-structured qualitative interview guide developed by the study team in collaboration with community members and key stakeholders. The interview questions were informed by the socioecological framework and were developed based on hypothesized barriers and facilitators of PrEP uptake and persistence identified in previous work with TGW as well as the expert opinions of the research team and key community stakeholders. Questions asked about general attitudes, experiences, and beliefs about PrEP, as well as the individual, interpersonal, community, and structural level factors that were hypothesized to potentially influence PrEP uptake and persistence. After the interview, participants completed a brief socio-demographic survey and were compensated \$50 for their participation.

Participant interviews were audio-recorded and transcribed for data analysis. All study protocols were approved by the Institutional Review Boards of the RAND Corporation and the University of California, San Diego.

PrEP drug concentrations

PrEP uptake and persistence were assessed in the parent demonstration project by collecting quantitative

intracellular tenofovir-diphosphate (TFV-DP) levels in retrospect on batched, banked DBS samples at week 12 and week 48 of the parent demonstration project. Once analyzed, the DBS results were then linked back to study participants through their assigned unique participant identification numbers. TFV-DP steady-state concentration levels of > 699 fmol/punch were considered to be protective (4-7 doses/week).^{48,49} For the purposes of the current analyses, participants who were found to have protective TFV-DP levels at both 12 weeks and 48 weeks were considered to have a “high-high” level of persistence (i.e., considered PrEP persistent for study duration), participants who were found to have suboptimal TFV-DP levels at week 12 but protective TFV-DP at week 48 were considered to have a “low-high” level of persistence, participants who were found to have protective TFV-DP levels at week 12 but suboptimal TFV-DP levels at week 48 were considered to have a “high-low” level of persistence. Because these analyses were focused on the self-reported facilitators of PrEP persistence, those who were found to have suboptimal TFV-DP levels at both week 12 and week 48 were not included in the current analyses.

Data analytic methods

A full overview of the data analytic methods based on the consolidated criteria for reporting qualitative research (COREQ) checklist⁵⁰ has been published previously.¹⁴ Briefly, the facilitators of PrEP uptake and persistence were coded according to standard qualitative content analytic methods.⁵¹ Two members of the study team (AO, EDS) independently read 10% of the interviews and applied a thematic analysis approach to identify key themes across the interview data.⁵²⁻⁵⁴ The analysts discussed the identified themes with the research team to generate a preliminary codebook including deductive (*a priori*) codes and subcodes, and inductive codes and subcodes grounded in the data. A draft codebook was developed, refined, and finalized after the team read the transcripts and provided multiple iterations of feedback. Researchers then applied the finalized codebook to code all transcripts using a qualitative data analysis system (NVIVO 12).⁵⁵ Twenty percent of randomly selected transcripts were double coded by a second study member resulting in excellent inter-rater reliability (Cohen’s Kappa = 0.84). Coding discrepancies were discussed among team members until consensus was reached. After coding, key themes were identified by researchers (AO, EDS) using inductive reasoning methodology.⁵⁶

Results

Participant characteristics

The socio-demographic characteristics of the TGW in this study are presented in Table 1. The average age of the TGW participants was 30.7 years [standard deviation (SD) = 8.6]. More than half (56.5%, n = 13) identified as Latinx, a fourth (26.1%, n = 6) identified as Black/African American, and the others identified as mixed Black and/or Latinx with other race/ethnicity (17.4%; n = 4). Most participants (65.2%, n = 15) identified their gender identity as TGW/trans female/transfeminine and almost half (47.8%, n = 11) reported their sexual identity as straight/heterosexual. The majority of participants (60.8%, n = 14) had an Associate's degree or higher, and 65.2% (n = 15) reported being legally employed during the previous 6 months. Most participants reported having stable

Table 1. Transgender women demographic characteristics (N = 23).

	Mean (SD); N (%)
Age (Years; Range 21–47)	30.73 (8.55)
Racial/Ethnic Identity	
Latinx	13 (56.5)
Black	6 (26.1)
Mixed Black and/or Latinx with other	4 (17.4)
Interview Language (Preferred), English	19 (82.6)
Current Gender Identity (may select multiple)	
Transgender woman/Transgender female/Transgender feminine	15 (65.2)
Non-Binary/Gender queer/Gender nonconforming	2 (8.7)
Female/Woman	6 (26.1)
Current Sexual Identity (may select multiple)	
Straight/Heterosexual	11 (47.8)
Bisexual	3 (13.0)
Gay/Lesbian/Same gender loving	3 (13.0)
Pansexual	3 (13.0)
Asexual or Demisexual	2 (8.7)
Other/Queer/Transgender or Nonconforming Oriented	3 (13.0)
Educational Attainment	
Less than High School or High School diploma/GED	9 (39.1)
Some college/Associate's degree	7 (30.4)
Bachelor's degree or more	7 (30.4)
Legal Employment (last 6 months)	15 (65.2)
Housing Status	
Stably housed	17 (73.9)
Supportive/Transitional Housing	3 (13.0)
Shelter, streets, squatting, or abandoned building	3 (13.0)
Relationship Status	
Single	16 (69.6)
In a committed relationship or married	4 (17.4)
Open relationship/other partners	3 (13.0)
Engaged in Sex Work (last 12 months)	9 (39.1)
PrEP Persistence (Measured with Dried Blood Spot Assay)	
High-High (adherent at baseline or week 12 and week 48)	12 (52.2)
Low-High (non-adherent at baseline or week 12 but adherent at week 48)	5 (21.7)
High-Low (adherent at baseline or week 12 but not at week 48)	6 (26.1)

housing (73.9%, n = 17) and being single (69.6%, n = 16). Over one third (39.1%, n = 9) reported having engaged in sex work during the previous year.

PrEP persistence

Results of TFV-DP DBS assay revealed 12 (52.2%) had high-high levels of persistence (meeting our criteria for persistence at both 12- and 48-week study visits), 5 (21.7%) had low-high levels of persistence, and 6 (26.1%) had high-low levels of persistence. Among the Black/African American TGW in this sample, 3 (50.0%) had high-high levels of persistence, 2 (33.3%) had low-high levels of persistence, and 1 (16.7%) had high-low levels of persistence. Among Latinx TGW, 7 (53.8%) high-high levels of persistence, 2 (12.5%) had low-high levels of persistence, and 4 (17.4%) had high-low levels of persistence. Among mixed race/ethnicity TGW, 2 (50.0%) high-high levels of persistence, 1 (25.0%) had a low-high level of persistence, and 1 (25.0%) had a high-low level of persistence. Our analysis did not reveal differences in facilitators discussed with respect to race or ethnicity among these TGW of color. While 64% of the participants were in the 21-29 years old range, there were no significant differences in the level of uptake or persistence on PrEP based on age in the current sample.

Findings

During content analysis we identified facilitators of PrEP uptake and persistence that we were able to categorize at the individual-, interpersonal/community-, and structural-levels (Table 2).

Individual-level facilitators

We identified four individual-level facilitators to PrEP uptake and persistence from the interviews: Use of

Table 2. Facilitators of PrEP uptake and persistence by level of influence.

Level of Influence	Facilitator
Individual-Level	Use of Reminders
	Having High Individual-level HIV Risk Position
	Feeling Empowered to Take PrEP and Having Improved Peace of Mind/Mental Health
Interpersonal / Community-Level	Motivation to Prevent HIV in the Community
	Motivation to Prevent HIV in the Context of Sex Work
Structural-Level	High Community-level HIV Risk Perception
	Having Positive Experiences in Affirming Healthcare Settings
	Having a PrEP Visit Combined with other Gender-Related Healthcare

Reminders, Having High Individual-level HIV Risk Perception, Feeling Empowered to Take Control of One's Sexual Health, and Improved Peace of Mind or Mental Health.

Use of reminders. Participants in the study were encouraged to set phone alarms or use a pillbox to remember to take their PrEP pills each day. Most study participants mentioned that the use of reminders helped them to remain persistent on PrEP, whether it be in the form of a daily pillbox, a keychain that had a compartment for PrEP pills, or a phone alarm.

“I always have my keys on me. I just pop a few of my PrEP pills in there. I can have extra ones with me, and when I forget to take them, I'll have them on me wherever I go.” (27-year-old, Latinx, high-high level of persistence)

Several participants in the study arm who received text message reminders to take PrEP mentioned that they found these text message reminders to be helpful in sustaining their PrEP use.

“I would have to say the reminders on the phone, the text reminders from an outside source...those little messages and reminders here and there, they kind of help get me into [taking PrEP]. And, I try to stay consistent with it.” (23-year-old, Latinx, high-high level of persistence)

Aside from simply serving as a reminder to take their PrEP, some participants mentioned that the knowledge that the message content was not autogenerated but coming from a real person, particularly if it was accompanied by an inspirational or motivation message, made a difference to them. One participant also stated that having to actively respond to the text message added a level of accountability that they found to be associated with an increased likelihood of taking their PrEP that would not have necessarily been there if they were not asked to respond to the text message.

Having high individual-level HIV risk perception. For many participants, having personal awareness that they were at risk for HIV from partners who may be having sex with multiple partners or who may use drugs also motivated some participants to take PrEP.

“I made the decision to take PrEP... I was having sex with my partner, and he also had a girlfriend, she also has sex elsewhere. And I also take care of myself by using condoms to prevent venereal diseases. And [my partner] is also a person who uses and has used drugs for many years. And for prevention, because

I was very much at risk, and I was not using PrEP and now that I use PrEP I feel safer.” (23-year-old, Black, high-high level of persistence)

Beyond knowing that one was at risk for HIV, participants also mentioned knowing that they belong to multiple minoritized groups that are impacted by social and structural forces associated with increased risk of HIV as being a motivator for them to take PrEP.

“I think for me it was just the fear of getting HIV. That alone was a huge motivator. I just feel like... there's a lot of intersectionality that I have. I'm gender nonconforming. I'm Black. I was assigned male at birth, and so there's these expectations of masculinity and all of that kind of thing and just like a lot sort of coming together. And I think statistically I'm at very high risk.” (24-year-old, Black, low-high level of persistence)

The above participant exhibited a low-high level of persistence meaning they were not observed to be at a protective PrEP level at week 12 of the study but by week 48 they were at a protective level. This delay in the uptake of PrEP, may have been due to an increased understanding or recognition of risk that come about during the study period, possibly in part due to increased information about HIV risk and PrEP provided as a part of study participation. Alternative explanations may include an increase in risk behavior or a hesitancy to start PrEP due to concerns related to the medication that reduced over time.

Feeling empowered and having improved peace of mind and mental health. Some participants mentioned that taking PrEP contributed to feeling more empowered in their lives overall. There was a sense among some participants that they live in constant danger as TGW, and that PrEP was one way of taking back some control of their health. These women described that by taking PrEP it reduced some of their overall health-related anxiety, improved their confidence, and helped improve their overall mental health.

“I feel safe, I feel more confident, more trustworthy of myself because I know that it will protect me from this disease that I think we are all afraid of.” (26-year-old, Latinx, high-high level of persistence)

Some participants recognized that PrEP was especially important to take in the context of engaging risk behaviors, they stated it gave them peace of mind and improved mental health, knowing that they were protecting themselves and their partners from HIV.

“I started having a lot of sex... I was like, ‘wait, maybe it's smart if I go on PrEP?...[Before, I] did the

same risk behaviors, just was very uncomfortable and insecure about what the outcomes would be... And then I took PrEP, and I did the same risk behaviors but just felt like my mental health was like better because I didn't – wasn't as concerned about that transmission." (24-year-old, Latinx, high-high level of persistence)

One participant who described having been sexually assaulted in the past, expressed that taking PrEP made her feel protected from HIV should she ever be victimized again.

"I've been sexually assaulted in the past... if it actually happened again, than I'll at least be protected, you know, by [PrEP]." (29-year-old, Black & Latinx, high-high level of persistence)

Interpersonal/community-level facilitators

We identified three interpersonal and/or community-level facilitators of PrEP persistence from the interviews: Motivation to take PrEP to Help Prevent HIV in the Trans Community, Motivation to Prevent HIV Transmission in the Context of Sex Work, and High Community-level Risk Perception.

Motivation to prevent HIV in the trans community. Participants were highly motivated to prevent the spread of HIV among their sex partners and their community. There was recognition that the trans community is small and participants mentioned that their motivation for taking PrEP extended beyond their own risk, to being highly motivated to protect others in the trans community, stating that members of the trans community need to look out for one another.

"[I] think we have to support each other in the trans community, talk, give each other advice because someone who is not trans is not going to do this. So, we must support each other, and protect each other from HIV, like me, for example, I did not know about PrEP until I met other TGW. So, that helped me because I had no knowledge of PrEP." (26-year-old, Latinx, high-high level of persistence)

Motivation to prevent HIV in the context of sex work. It was mentioned that PrEP may be particularly empowering for TGW in the context of sex work as they may find it more difficult to advocate for safer sex practices with partners who are potentially using substances and/or may become violent.

"A lot of my sex worker friends, they want [PrEP] because... There's a lot of violence in sex work. Sometimes they'll throw the girls around. Or, if they're getting high and doing it, it makes it difficult

for them, in that moment, if they're too high, to actually pull out the condom and stuff like that. Yeah, there's a whole lot of fear in our niche of our community. So, I feel like that's a huge reason [to take PrEP]." (27-year-old, Latinx, high-high level of persistence)

High community-level HIV risk perception. A participant discussed being motivated to take PrEP because they had the awareness that they belonged to both racial/ethnic and gender minority communities and thus they were members of a particularly vulnerable population.

"I know the statistics of how vulnerable my population, my community, as African American and as Transgender folks...I was always afraid that I was going to get HIV...We lived in a world at the time that felt like regardless of how safe you were being, you weren't sexually attractive if you didn't allow someone to have this bareback fun." (27-year-old, Latinx, high-high level of persistence)

Other participants stated being motivated to take PrEP as an adaptive response to the fear of HIV that has been socialized among certain LGBT identities. The decision to take PrEP in the context of this identity-based fear felt like an empowering way to take care of one another within the LGBT community.

"I feel like there's a lot of fear in the LGBT community about diseases. Especially a lot of HIV-related diseases. There's a lot of fear, and that's just pushed on us basically from the moment we walk over to the LGBT side. There's not a lot of empowerment. I feel like PrEP can be super empowering because it's not just taking care of yourself, you are taking care of the LGBT community." (27-year-old, Latinx, high-high level of persistence)

Structural-level facilitators

We identified two structural-level facilitators of PrEP uptake and persistence: Having Positive Experiences in Affirming Healthcare Settings and Having a PrEP Visit Combined with Other Gender-related Healthcare.

Having positive experiences in affirming healthcare settings. Participants discussed the experience of receiving affirming treatment at their medical appointments as being a key reason for their decision to begin PrEP. The experience of not feeling judged, misgendered, or misnamed was seen as particularly protective for engagement in PrEP care.

"That was like what made me want to come for a study...that comfort that I received the first time that I came with the doctor here. Like I wasn't like - like I didn't feel judged, I didn't feel like any - like she was

looking at me a certain type of way. Like it looked like she was looking - like just the fact that they called me [by my name] for the first time. Like when they called me in, I was like, ‘Oh, wow.’” (34-year-old, Latinx, high-low level of persistence)

While we observed protective levels of PrEP at week 12 with the above participant, protective levels were no longer observed at week 48. This may have been due to fluctuating risk behaviors, or due to the myriad social and structural barriers to PrEP that some participants reported, suggesting that some participants may need higher levels of ongoing support in order to maintain ongoing PrEP persistence.

Other participants shared that they felt a connection to their community through PrEP and being able to access PrEP through clinics serving the LGBTQ+ community. Receiving their health care in an affirming place, where they saw their community reflected, was a deciding factor for them to initiate PrEP.

“Yes, wanting to contribute to research and be part of a community, being more connected to my community. I think if it was probably just—if there wasn’t this study or if I wasn’t able to access PrEP at like an LGBTQ clinic or community center, I wouldn’t be taking it. I like coming here because I feel more connected to my community, and I think that’s one of the main reasons I’m taking PrEP.” (24-year-old, Latinx, high-high level of persistence)

Pairing PrEP with other gender-related healthcare. Participants mentioned that the ability to combine their PrEP visits with other gender-related healthcare, including pairing their PrEP visits with visits for hormone replacement therapy was particularly helpful.

“Being able to talk to my doctor about PrEP and my hormones at the same time has been huge for me. I think if it wasn’t for starting hormones, it would have been much harder to take [PrEP].” (27-year-old, Latinx, high-high level of persistence)

Beyond pairing their PrEP and gender-related visits, some participants found it particularly useful to combine taking their PrEP pills with when they take their hormones each day.

“Before I got on hormones, I never was on a daily pill routine of like medicine that I have to take on a daily, or weekly, or anything like that, so just the fact that I can add [PrEP] into whatever I’m taking like before bed or stuff like that, that’s what made [taking PrEP] easy for me and made it possible.” (34-year-old, Latinx, high-low level of persistence)

Again, it is important to note that while this participant mentioned combining her PrEP medication

with her hormone medications as a facilitators, protective levels were no longer observed at week 48. This again may have been due to fluctuating risk behaviors, changes in hormone therapy, or the many competing social and structural barriers to PrEP that have previously been reported among TGW.

The below participant mentioned that they were even able to forgo the text message reminders because pairing their PrEP with their other medications has been working very well for them.

“I got rid of the alert because I just got used to taking it [PrEP] with my estrogen. And, at the time, my Spironolactone and now I just remember to take it with my bone density medication.” (30-year-old, Black, high-high level of persistence)

Discussion

While the majority of previous research on PrEP among TGW has been related to knowledge, awareness, and willingness to use PrEP,^{41,57–60} this research focuses on the specific facilitators of PrEP persistence among Black and Latinx TGW. We identified several individual, interpersonal/community, and structural facilitators of PrEP persistence. This study extends the previous research that has focused on the barriers to PrEP persistence among gender minority communities to specifically focus on the facilitators that support PrEP persistence among a sample of Black and Latinx TGW many of whom have been able to persist on PrEP despite experiencing myriad obstacles.^{14,40,41}

We hope studies such as this one can help counter the misinformation and devaluing of transgender people by providing insights into how to achieve better health outcomes for this marginalized group.

The data presented in this paper come from a sociopolitical time when the lives and rights of TGW of color are constantly threatened with acts of violence and anti-trans legislation. This study suggests that motivations for taking PrEP among these Black and Latinx TGW extends beyond the individual-level (e.g., desire to protect oneself from HIV infection) to larger motivations to take care of one another in the broader trans community. These TGW emphasized their motivation to take PrEP in order to protect their partners and other the members of the trans community from HIV. Future intervention efforts that leverage the interpersonal and community-level motivations expressed by these women about “looking out for [their] own community” may be particularly effective. Interventions focused on PrEP uptake and persistence among TGW of color should harness the highly networked communities of TGW and the altruistic

motivations for taking PrEP to protect other members of the TGW community along with as the feelings of empowerment and peace of mind that accompanies taking PrEP. Participants emphasized importance of offering PrEP along with other services that are provided “for the community, by the community” as TGW generally greatly value the health of their fellow community members. Pursuing a goal like PrEP persistence alongside other members of a group with shared identity may also help to improve group member motivation and accountability.^{61–63}

Participants in the current study described the experience of having gender-affirming and empowering interactions with healthcare providers as a particularly salient facilitators of PrEP uptake and persistence among the TGW interviewed. This finding is consistent with studies that have found that receiving quality, affirming health services in a welcoming and trans-friendly environment was associated with increased engagement in sexual health services⁴² and where trans clients can connect and derive support from one another as well as from their providers.^{64,65} Gender affirmation⁴³ and healthcare empowerment⁶⁶ have been shown to moderate the deleterious impact that trans-related discrimination has on rates of viral suppression among Black and Latinx TGW with HIV.⁶⁷ Guidelines for gender-affirming care of trans and non-binary people include ensuring a safe and welcoming environment by utilizing a patient’s gender identity, and taking a gender-affirming approach for any physical exams.⁶⁸ When HIV is discussed, prevention and care strategies should be adapted to the patient’s gender identity and be discussed in the broader context of health for trans persons (i.e., hormone replacement therapy, mental health, etc.).⁶⁸ Further work is needed to assess the overall impact that the model of gender affirmation⁴³ and healthcare empowerment⁶⁶ have on PrEP uptake and persistence in among TGW of color.

Some participants in the current study specifically indicated that pairing their PrEP care and PrEP medications with their gender-related care and use of hormones was particularly useful for consistently taking PrEP. This finding is consistent with work that has shown how current hormone use is significantly associated with engagement in the HIV care continuum for Black and Latinx women with HIV.⁶⁶ Comprehensive whole health and wellness-focused prevention services offered in community settings that simultaneously acknowledge and seek to reduce some of the other multilevel social (e.g., oppression, stigma) and structural (e.g., housing insecurity, legal challenges, under employment) barriers to care^{15,16,19,21,69–72}

are likely to be among the most effective ways of engaging Black and Latinx TGW in PrEP care.

The findings from this paper should be interpreted with the following limitations in mind. The interviews took place while the demonstration project was ongoing, and while all participants had completed the 12-week visit, the 48-week DBS data had not been assessed at the time of all interviews, so we were unable to specifically ask those who stopped taking PrEP midway through the study why they did not persist. Moreover, because some study participants received brief motivational interviewing and text message support for PrEP adherence from the parent study, they may have been primed to discuss these reminders as facilitators of their persistence. Importantly, we did not find differences observed differences in objective drug concentration levels among the 23 participants in this qualitative study according to study arm. Future studies should aim to assess the barriers and facilitators of PrEP uptake and persistence among a larger sample of TGW of color outside the context of a PrEP intervention. Despite these limitations, major strengths of the study include a focus on the facilitators of PrEP uptake and persistence among Black and Latinx TGW who had objective drug concentration measurement, as opposed to self-reported use.

Conclusions

This study is among the first to elucidate the individual-, interpersonal/community-, and structural-level facilitators of PrEP uptake and persistence among a sample of Black and Latinx TGW participating in a PrEP demonstration project. The participants described a high level of resilience, agency, and fortitude as both individuals and as members of their community. The current findings are hopeful and suggest that PrEP persistence is possible in the face of myriad oppressive social and structural forces impacting TGW of color. These findings suggest that programs looking to facilitate PrEP uptake and bolster persistence among TGW may have the highest likelihood of success by actively leveraging the networks of TGW to promote PrEP as community-level protection and as a way of taking care of one another in the trans community. Interventions that encourage group-level goal setting with accountability and support from peers are also likely to be helpful. Moreover, these findings suggest that to be maximally effective, PrEP and other sexual health programs for TGW should be housed in healthcare spaces that are welcoming and gender-affirming, that utilize care coordination

and reminder tools, and where clients can address gender transition, mental health, and other care needs. Understanding the factors that bolster and leverage resilience are paramount for informing ongoing efforts to enhance HIV prevention and promote health equity among Black and Latinx TGW.

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No potential conflict of interest was reported by the authors.

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References

- [1] Baral SD, Poteat T, Strömdahl S, Wirtz AL, Guadamuz TE, Beyrer C. Worldwide burden of HIV in transgender women: a systematic review and meta-analysis. *Lancet Infect Dis*. 2013;13(3):214–222. doi:10.1016/S1473-3099(12)70315-8.
- [2] Herbst JH, Jacobs ED, Finlayson TJ, et al. Estimating HIV prevalence and risk behaviors of transgender persons in the United States: a systematic review. *AIDS Behav*. 2008;12(1):1–17. doi:10.1007/s10461-007-9299-3.
- [3] Centers for Disease Control and Prevention (CDC). *HIV Surveillance Report*. Atlanta, GA: CDC; 2013.
- [4] Zimmerman RS, Benotsch EG, Shoemaker S, et al. Mediation models linking psychosocial context, mental health problems, substance use, and HIV risk behaviors in transgender women. *Health Psychol Behav Med*. 2015;3(1):379–390. doi:10.1080/21642850.2015.1093423.
- [5] Wilson EC, Santos G-M, Raymond HF. Sexual mixing and the risk environment of sexually active transgender women: data from a respondent-driven sampling study of HIV risk among transwomen in San Francisco, 2010. *BMC Infect Dis*. 2014;14(1):1. doi:10.1186/1471-2334-14-430.
- [6] Nuttbrock L, Hwahng S, Bocking W, et al. Lifetime risk factors for HIV/STI infections among male-to-female transgender persons. *J Acquired Immune Deficiency Syndromes*. 2009;52(3):417–421. doi:10.1097/QAI.0b013e3181ab6ed8.
- [7] Kenagy GP. HIV among transgendered people. *AIDS Care*. 2002;14(1):127–134. doi:10.1080/09540120220098008.
- [8] Centers for Disease Control and Prevention. *HIV Testing at CDC-Funded Sites, United States, Puerto Rico, and the US Virgin Islands, 2008–2009*. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention; 2011.
- [9] Austin A, Craig SL. Transgender affirmative cognitive behavioral therapy: Clinical considerations and applications. *Prof Psychol: Res Pract*. 2015;46(1):21–29. doi:10.1037/a0038642.
- [10] Poteat T, Reisner SL, Radix A. HIV epidemics among transgender women. *Curr Opin HIV AIDS*. 2014;9(2):168–173. doi:10.1097/COH.0000000000000030.
- [11] Jaspal R, Kennedy L, Tariq S. Human immunodeficiency virus and trans women: a literature review. *Transgend Health*. 2018;3(1):239–250. doi:10.1089/trgh.2018.0005.
- [12] Becasen JS, Denard CL, Mullins MM, Higa DH, Sipe TA. Estimating the prevalence of HIV and sexual behaviors among the US transgender population: a systematic review and meta-analysis, 2006–2017. *Am J Public Health*. 2019;109(1):e1–e8. doi:10.2105/AJPH.2018.304727.
- [13] Jennings Mayo-Wilson L, Benotsch EG, Grigsby SR, et al. Combined effects of gender affirmation and economic hardship on vulnerability to HIV: a qualitative analysis among US adult transgender women. *BMC Public Health*. 2020;20(1):1–17. doi:10.1186/s12889-020-08902-3.
- [14] Ogunbajo A, Storholm ED, Ober AJ, et al. Multilevel barriers to HIV PrEP uptake and adherence among black and hispanic/latinx transgender women in Southern California. *AIDS Behav*. 2021;25(7):2301–2315. doi:10.1007/s10461-021-03159-2.
- [15] Fletcher JB, Kisler KA, Reback CJ. Housing status and HIV risk behaviors among transgender women in Los Angeles. *Arch Sex Behav*. 2014;43(8):1651–1661. doi:10.1007/s10508-014-0368-1.
- [16] Poteat T, Wirtz AL, Radix A, et al. HIV risk and preventive interventions in transgender women sex workers. *The Lancet*. 2015;385(9964):274–286. doi:10.1016/S0140-6736(14)60833-3.

- [17] Herman, J. L JS, Rankin S, Keisling M, Mottet L, Anafi M. *The Report of the 2015 U.S. Transgender Survey*. Washington, DC: National Center for Transgender Equality; 2016.
- [18] Poteat T, Scheim A, Xavier J, Reisner S, Baral S. Global epidemiology of HIV infection and related syndemics affecting transgender people. *J Acquired Immune Deficiency Syndromes*. 2016;72(Suppl 3):S210–S219. doi:10.1097/QAI.0000000000001087.
- [19] Operario D, Soma T, Underhill K. Sex work and HIV status among transgender women: systematic review and meta-analysis. *J Acquired Immune Deficiency Syndromes*. 2008;48(1):97–103. doi:10.1097/QAI.0b013e31816e3971.
- [20] Reisner SL, Radix A, Deutsch MB. Integrated and gender-affirming transgender clinical care and research. *J Acquired Immune Deficiency Syndromes*. 2016;72(Suppl 3):S235–S242. doi:10.1097/QAI.0000000000001088.
- [21] Brennan J, Kuhns LM, Johnson AK, Belzer M, Wilson EC, Garofalo R. Syndemic theory and HIV-related risk among young transgender women: the role of multiple, co-occurring health problems and social marginalization. *Am J Public Health*. 2012;102(9):1751–1757. doi:10.2105/AJPH.2011.300433.
- [22] Deutsch MB, Glidden DV, Sevelius J, et al. HIV pre-exposure prophylaxis in transgender women: a subgroup analysis of the iPrEx trial. *The Lancet HIV*. 2015;2(12):e512–e519. doi:10.1016/S2352-3018(15)00206-4.
- [23] Grant RM, Anderson PL, McMahan V, et al. Uptake of pre-exposure prophylaxis, sexual practices, and HIV incidence in men and transgender women who have sex with men: a cohort study. *Lancet Infect Dis*. 2014;14(9):820–829. doi:10.1016/S1473-3099(14)70847-3.
- [24] Poteat T, Wirtz A, Malik M, et al. A gap between willingness and uptake: findings from mixed methods research on HIV prevention among black and Latina transgender women. *J Acquired Immune Deficiency Syndromes*. 2019;82(2):131–140. doi:10.1097/QAI.0000000000002112.
- [25] Eaton LA, Matthews DD, Driffin DD, et al. A multi-US city assessment of awareness and uptake of pre-exposure prophylaxis (PrEP) for HIV prevention among black men and transgender women who have sex with men. *Prev Sci*. 2017;18(5):505–516. doi:10.1007/s11121-017-0756-6.
- [26] D'Avanzo PA, Bass SB, Brajuha J, et al. Medical mistrust and PrEP perceptions among transgender women: a cluster analysis. *Behav Med*. 2019;45(2):143–152. doi:10.1080/08964289.2019.1585325.
- [27] Bauermeister JA, Meanley S, Pingel E, Soler JH, Harper GW. PrEP awareness and perceived barriers among single young men who have sex with men. *Curr HIV Res*. 2013;11(7):520–527. doi:10.2174/1570162x12666140129100411.
- [28] Brooks RA, Landovitz RJ, Kaplan RL, Lieber E, Lee SJ, Barkley TW. Sexual risk behaviors and acceptability of HIV pre-exposure prophylaxis among HIV-negative gay and bisexual men in serodiscordant relationships: a mixed methods study. *AIDS Patient Care STDS*. 2012;26(2):87–94. doi:10.1089/apc.2011.0283.
- [29] Braun HM, Candelario J, Hanlon CL, et al. Transgender women living with HIV frequently take antiretroviral therapy and/or feminizing hormone therapy differently than prescribed due to drug–drug interaction concerns. *LGBT Health*. 2017;4(5):371–375. doi:10.1089/lgbt.2017.0057.
- [30] Lacombe-Duncan A. An intersectional perspective on access to HIV-related healthcare for transgender women. *Transgend Health*. 2016;1(1):137–141. doi:10.1089/trgh.2016.0018.
- [31] Mizuno Y, Beer L, Huang P, Frazier EL. Factors associated with antiretroviral therapy adherence among transgender women receiving HIV medical care in the United States. *LGBT Health*. 2017;4(3):181–187. doi:10.1089/lgbt.2017.0003.
- [32] Rodriguez A, Agardh A, Asamoah BO. Self-reported discrimination in health-care settings based on Recognizability as transgender: a cross-sectional study among transgender US citizens. *Arch Sex Behav*. 2018;47(4):973–985. doi:10.1007/s10508-017-1028-z.
- [33] Sevelius JM, Patouhas E, Keatley JG, Johnson MO. Barriers and facilitators to engagement and retention in care among transgender women living with human immunodeficiency virus. *Ann Behav Med*. 2014;47(1):5–16. doi:10.1007/s12160-013-9565-8.
- [34] Sevelius JM, Saberi P, Johnson MO. Correlates of antiretroviral adherence and viral load among transgender women living with HIV. *AIDS Care*. 2014;26(8):976–982. doi:10.1080/09540121.2014.896451.
- [35] Williamson C. Providing care to transgender persons: a clinical approach to primary care, hormones, and HIV management. *J Assoc Nurses AIDS Care*. 2010;21(3):221–229. doi:10.1016/j.jana.2010.02.004.
- [36] Xavier J, Bradford J, Hendricks M, et al. Transgender health care access in Virginia: a qualitative study. *Int J Transgenderism*. 2013;14(1):3–17. doi:10.1080/15532739.2013.689513.
- [37] Radix AE, Harris AB, Goldstein ZG. How can we improve uptake of oral HIV pre-exposure prophylaxis for transgender individuals? *Expert Rev Anti Infect Ther*. 2020;18(9):835–838. doi:10.1080/14787210.2020.1759418.
- [38] Wood S, Gross R, Shea JA, et al. Barriers and facilitators of PrEP adherence for young men and transgender women of color. *AIDS Behav*. 2019;23(10):2719–2729. doi:10.1007/s10461-019-02502-y.
- [39] Bronfenbrenner U. *Ecological Systems Theory*. London, United Kingdom: Jessica Kingsley Publishers; 1992.
- [40] Sevelius JM, Keatley J, Calma N, Arnold E. 'I am not a man': trans-specific barriers and facilitators to PrEP acceptability among transgender women. *Glob Public Health*. 2016;11(7–8):1060–1075. doi:10.1080/17441692.2016.1154085.
- [41] Restar AJ, Kuhns L, Reisner SL, Ogunbajo A, Garofalo R, Mimiaga MJ. Acceptability of antiretroviral pre-exposure prophylaxis from a cohort of sexually experienced young transgender women in two US cities. *AIDS Behav*. 2018;22(11):3649–3657. doi:10.1007/s10461-018-2127-0.
- [42] Rebchook G, Keatley J, Contreras R, et al. The transgender women of color initiative: implementing and evaluating innovative interventions to enhance engage-

- ment and retention in HIV care. *Am J Public Health*. 2017;107(2):224–229. doi:10.2105/AJPH.2016.303582.
- [43] Sevelius JM. Gender affirmation: a framework for conceptualizing risk behavior among transgender women of color. *Sex Roles*. 2013;68(11–12):675–689. doi:10.1007/s11199-012-0216-5.
- [44] Lacombe-Duncan A, Logie CH, Newman PA, Bauer GR, Kazemi M. A qualitative study of resilience among transgender women living with HIV in response to stigma in healthcare. *AIDS Care*. 2020;32(8):1008–1013. doi:10.1080/09540121.2020.1728212.
- [45] Matsuno E, Israel T. Psychological interventions promoting resilience among transgender individuals: Transgender resilience intervention model (TRIM). *Counseling Psychologist*. 2018;46(5):632–655. doi:10.1177/0011000018787261.
- [46] Meyer IH. Resilience in the study of minority stress and health of sexual and gender minorities. *Psychol Sexual Orientation Gender Diversity*. 2015;2(3):209–213. doi:10.1037/sgd0000132.
- [47] Moore DJ, Jain S, Dubé MP, et al. Randomized controlled trial of daily text messages to support adherence to preexposure prophylaxis in individuals at risk for human immunodeficiency virus: the TAPIR study. *Clin Infect Dis*. 2018;66(10):1566–1572. doi:10.1093/cid/cix1055.
- [48] Anderson PL, Liu AY, Castillo-Mancilla JR, et al. Intracellular tenofovir-diphosphate and emtricitabine-triphosphate in dried blood spots following directly observed therapy. *Antimicrob Agents Chemother*. 2018;62(1), e01710-17. doi:10.1128/AAC.01710-17.
- [49] Landovitz RJ, Beymer M, Kofron R, et al. Plasma tenofovir-levels to support adherence to TDF/FTC pre-exposure prophylaxis for HIV prevention in MSM in Los Angeles, California. *J Acquired Immune Deficiency Syndromes (1999)*. 2017;76(5):501–511. doi:10.1097/QAI.0000000000001538.
- [50] Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care*. 2007;19(6):349–357. doi:10.1093/intqhc/mzm042.
- [51] Mayring P. Qualitative content analysis. *Companion Qual Res*. 2004;1:159–176.
- [52] Ryan GW, Bernard HR. Techniques to identify themes. *Field Methods*. 2003;15(1):85–109. doi:10.1177/1525822X02239569.
- [53] Applied Thematic Analysis. Thousand Oaks, CA; 2012. <https://methods.sagepub.com/book/applied-thematic-analysis>. Accessed December 28, 2021.
- [54] Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology*. 2006;3(2):77–101. doi:10.1191/1478088706qp0630a.
- [55] Edhlund B, McDougall A. *Nvivo 12 Essentials*. Lulu.com; 2019.
- [56] Elo S, Kyngäs H. The qualitative content analysis process. *J Adv Nurs*. 2008;62(1):107–115. doi:10.1111/j.1365-2648.2007.04569.x.
- [57] Garnett M, Hirsch-Moverman Y, Franks J, Hayes-Larson E, El-Sadr WM, Mannheimer S. Limited awareness of pre-exposure prophylaxis among black men who have sex with men and transgender women in New York city. *AIDS Care*. 2018;30(1):9–17. doi:10.1080/09540121.2017.1363364.
- [58] Hoagland B, De Boni RB, Moreira RI, et al. Awareness and willingness to use pre-exposure prophylaxis (PrEP) among men who have sex with men and transgender women in Brazil. *AIDS Behav*. 2017;21(5):1278–1287. doi:10.1007/s10461-016-1516-5.
- [59] Wilson E, Chen Y-H, Pomart WA, Arayasirikul S. Awareness, interest, and HIV pre-exposure prophylaxis candidacy among young transwomen. *AIDS Patient Care STDS*. 2016;30(4):147–150. doi:10.1089/apc.2015.0266.
- [60] Reback CJ, Clark KA, Rüniger D, Fehrenbacher AE. A promising PrEP navigation intervention for transgender women and men who have sex with men experiencing multiple syndemic health disparities. *J Community Health*. 2019;44(6):1193–1203. doi:10.1007/s10900-019-00705-x.
- [61] Kullgren JT, Troxel AB, Loewenstein G, et al. Individual-versus group-based financial incentives for weight loss: a randomized, controlled trial. *Ann Intern Med*. 2013;158(7):505–514. doi:10.7326/0003-4819-158-7-201304020-00002.
- [62] Fryer RG, Levitt SD, List J, Sadoff S. *Enhancing the Efficacy of Teacher Incentives through Loss Aversion: A Field Experiment*. Cambridge, MA: National Bureau of Economic Research; 2012.
- [63] Babcock P, Bedard K, Charness G, Hartman J, Royer H. Letting down the team? Social effects of team incentives. *J Eur Econ Assoc*. 2015;13(5):841–870. doi:10.1111/jeea.12131.
- [64] Pinto RM, Melendez RM, Spector AY. Male-to-female transgender individuals building social support and capital from within a gender-focused network. *J Gay Lesbian Soc Serv*. 2008;20(3):203–220. doi:10.1080/10538720802235179.
- [65] Sevelius JM, Glidden DV, Deutsch M, et al. Uptake, retention, and adherence to pre-exposure prophylaxis (PrEP) in TRIUMPH: a peer-led PrEP demonstration project for transgender communities in Oakland and Sacramento, California. *J Acquired Immune Deficiency Syndromes*. 2021;88(S1):S27–S38. doi:10.1097/QAI.0000000000002808.
- [66] Sevelius JM, Xavier J, Chakravarty D, Keatley J, Shade S, Rebchook G. Correlates of engagement in HIV care among transgender women of color in the United States of America. *AIDS Behav*. 2021;25(Suppl 1):3–10. doi:10.1007/s10461-021-03306-9.
- [67] Sevelius J, Chakravarty D, Neilands TB, et al. Evidence for the model of gender affirmation: the role of gender affirmation and healthcare empowerment in viral suppression among transgender women of color living with HIV. *AIDS Behav*. 2021;25(Suppl 1):64–68. doi:10.1007/s10461-019-02544-2.
- [68] UCSF Transgender Care DoFaCM, University of California San Francisco. *Guidelines for the Primary and Gender-Affirming Care of Transgender and Gender Nonbinary People*. San Francisco, CA; 2016.
- [69] Neumann MS, Finlayson TJ, Pitts NL, Keatley J. Comprehensive HIV Prevention for Transgender Persons. *Am J Public Health*. 2017;107(2):207–212. doi:10.2105/AJPH.2016.303509.

- [70] James S, Herman J, Rankin S, Keisling M, Mottet L, Anafi M. *The Report of the 2015 US Transgender Survey*. Washington, DC: National Center for Transgender Equality; 2016.
- [71] Poteat T, Scheim A, Xavier J, Reisner S, Baral S. Global epidemiology of HIV infection and related syndemics affecting transgender people. *J Acquired Immune Deficiency Syndromes (1999)*. 2016;72(3):S210–S219. doi:10.1097/QAI.0000000000001087.
- [72] Reisner SL, Radix A, Deutsch MB. Integrated and gender-affirming transgender clinical care and research. *J Acquired Immune Deficiency Syndromes (1999)*. 2016;72(3):S235–S242. doi:10.1097/QAI.0000000000001088.