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We found low self-perceived HIV risk and sub-optimal PrEP adherence despite moderate mHealth app acceptability and frequent self-reported engagement in risky sexual behaviors.

Making PrEP Smart: Persistence, Use, and Acceptability of a PrEP Adherence and HIV-Self Testing App Among Women in the South Bronx, New York City

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Background

- **Women continue to bear a significant burden of the HIV epidemic in the United States,** accounting for 18% of new diagnoses in 2022, but only 8% of PrEP users in 2023.
- Transgender people comprise an estimated 0.6% of the US population aged 13 years and older and are also disproportionately vulnerable to HIV, accounting for 2% of 2022 diagnoses.
- **New York City is a long-standing epicenter of the US HIV epidemic**, with the South Bronx consistently experiencing high rates of new HIV diagnoses.
- **Digital health interventions, including mobile health (mHealth) tools, have the potential to facilitate a wide range of HIV prevention** interventions in non-clinical settings, including supporting PrEP adherence, HIVST, and remote data collection for prevention research.
- This pilot study evaluated the use and acceptability of "SmartPrEP", a mobile app designed to support PrEP adherence and HIV self- and partner-testing, among cis- and transgender women.

Methods

- We conducted a **12-month, single-arm, open-label, pilot study** among **cis- and transgender women** to assess PrEP adherence and acceptability of a smartphone app designed to support HIV prevention.
- **Non-pregnant adults aged ≥18 years who self-identified as cis- or transgender women, were eligible for PrEP and were either not currently taking PrEP, or reported PrEP use for < 3 months, or inconsistent PrEP use of any duration, were eligible to participate.**
- Study follow-up consisted of six in-person visits (enrollment, month 1, and three additional quarterly visits) which included assessments of sexual behavioral risk, **and nineteen interview-administered questions on acceptability of the SmartPrEP app (1 low – 5 high).**
- **The SmartPrEP app facilitated daily remote collection** of logged PrEP doses, reasons for missing a PrEP dose, and results of any HIV self-testing conducted by the participant and/or partners, and their results.

Results

- Between January 2022 - August 2023, 104 individuals were pre-screened, with 52 completing a full screening visit at the research site. Among those screened as eligible, **40 participants enrolled in the study, with 18 (45%) completing the full one-year study follow-up.**
- Participant median age was 30 years, 70% (n=28) identified as cisgender women, 30% (n=12) as transgender women, 48% (n=19) Hispanic, and 43% (n=17) as Black. Most participants were not in a relationship (70%) and were not employed (58%) [Table 1].
- In the 6 months prior to enrollment, **35%(n=14) of participants believed they were at risk of HIV**, despite **90% (n=36) reporting ≥1 risk behavior, and 25% (n=10) > 4 HIV risk behaviors [Table 1]**
- **Twenty percent of participants (n=8) had a history of PrEP use**, but only 7.5% (n=3) reported daily PrEP use within the past months [Table 1].
- **At 12 months, 28 of 36 participants (78%) self-reported an average of 0-3 PrEP pills per week, five (14%) reported an average of 3-5 weekly PrEP pills, and only three (8%) reported close to optimal adherence with an average of 5-7 weekly PrEP pills [Figure 1].**
- **Four participants conducted an at-home HIV test (self or partner testing) using the SmartPrEP app.** The two most common reasons for at-home testing were concern about partners' sexual behavior and wanting to know their own HIV status [Figure 1].
- Among the 18 participants who completed twelve months of follow-up, **median app acceptability (1 – low, 5 high) peaked at month 6 (median: 3.90, IQR: 3.58 – 4.05) and showed moderate, consistent acceptability until month twelve (median: 3.71. IQR: 3.47-3.16).**

Conclusions

This 12-month pilot study evaluating a mHealth app among cis and transgender women found low levels of PrEP adherence as recorded in the app, despite moderate app acceptability. Low PrEP use, in addition to low HIV risk perception and limited use of HIV self/partner testing via the app, suggest that more active PrEP awareness and navigation strategies are needed to increase uptake among PrEP-indicated women.

Figure: *Heatmap of Weekly PrEP Adherence (# "Yes" Responses to Daily Dosing Query per Week and HIVST Use (N=40)*

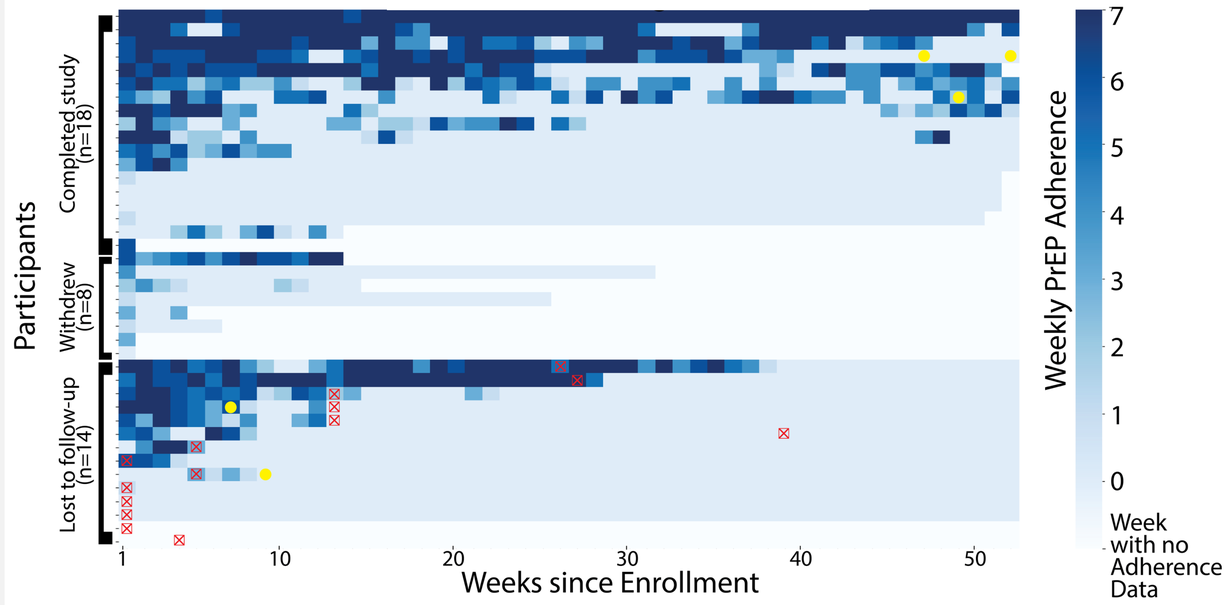

Table: *Participant Demographics and Behavior Associated with PrEP Indication*

Demographics	Percent (%)	Count (N=40)
Age [median (IQR)]	30 (24 - 35)	
Gender identity:		
Cisgender Female	70	28
Transgender Female	30	12
Relationship status:		
Married/civil union/legal partnership	7.5	3
In a relationship	22.5	9
Single/divorced/widowed	70	28
Employment status:		
Full-time employment	27.5	11
Part-time employment	15	6
Not employed	57.5	23
Education:		
Completed Primary school	20	8
Completed Secondary School	30	12
Completed Technical School	5	2
Some College/university or higher	22.5	9
Completed College/university or higher	22.5	9
Race and Ethnicity:		
Hispanic	47.5	19
African American, Afro-Carribean, or Black	35	14
White or Caucasian	10	4
Multiracial	5	2
Philipino	2.5	1
Have you ever been diagnosed with anxiety, depression, bipolar disorder, schizophrenia or any other psychiatric illness?		
Yes	52.5	21
No	47.5	19
Do you have a Primary Care Provider ?		
Yes	67.5	27
No	32.5	13

Sexual Behaviors and Sexual Health		
Do you personally believe you are at risk of getting HIV?		
Yes	35	14
No	57.5	23
Don't' Know	7.5	3
In the last 6 months, have you taken medications because of a possible exposure to HIV?		
Yes	10	4
No	90	36

Sexual Behaviors and Sexual Health		
Question	Percent (%)	Count (N)
In the last 6 months, have you been diagnosed with a sexually transmitted infection (STI)?		
Yes	20	8
No	77.5	31
Don't Know	2.5	1
In the last 6 months, have you had anal or vaginal sex with more than one sexual partner?		
Yes	57.5	23
No	37.5	15
Don't Know	5	2
In the last 6 months, have you had anal or vaginal sex with a male partner who may have sexual partners who identify as cis-gender males, or were assigned male at birth?		
Yes	25	10
No	52.5	21
Don't Know	22.5	9
In the last 6 months, have you had anal or vaginal sex without using a condom with a person whose HIV status was unknown?		
Yes	37.5	15
No	50	20
Don't Know	12.5	5
In the last 6 months, have you engaged in anal or vaginal sex without using a condom with a person who is HIV positive and has an unsuppressed viral load?		
Yes	5	2
No	80	32
Don't Know	15	6
In the last 6 months, have you been involved in transactional sex (i.e., sex for money, drugs, food, or housing), including commercial sex work?		
Yes	20	8
No	75	30
Don't Know	5	2
In the last 6 months, have you had sex with partners who may be involved in transactional sex (i.e., sex for money, drugs, food, or housing), including commercial sex work?		
Yes	20	8
No	55	22
Don't' Know	25	10
Have you ever used pre-exposure prophylaxis (PrEP)?		
Yes	20	8
No	80	32
Have you taken PrEP within the last 6 months?		
Yes	87.5	7
No	12.5	1

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