


# Get PrEP (pre-exposure prophylaxis and pregnancy termination): an exploration of the values, attitudes and preferences regarding HIV and PrEP among women seeking abortion

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## ABSTRACT

**Introduction** Pre-exposure prophylaxis (PrEP) for the prevention of HIV transmission is under utilised by women in the US. Women seeking abortion have a higher HIV prevalence than women who continue prenatal care and could benefit from HIV risk assessment and PrEP counselling. We assessed the knowledge, attitudes, and preferences of women seeking abortion care regarding their HIV risk and knowledge of PrEP, and identified individual and system barriers to PrEP access.

**Methods** We performed a cross sectional descriptive study of English speaking women at a freestanding abortion clinic through an anonymous survey. Participants with indications for PrEP care included those who performed sex work, experienced a recent sexually transmitted infection, or had multiple sexual partners and inconsistent condom use. We performed descriptive statistics on response data; Wilcoxon tests were used to compare continuous variables across groups.

**Results** 64 (32.3%) participants had indications for PrEP, but only 31 (16.1%) had previous knowledge of PrEP. After the concept was explained, attitudes towards PrEP were generally positive, and 54 participants (27.8%) would consider starting PrEP in the next 6 months. Participants were most interested in receiving PrEP care from their primary care provider rather than from an abortion clinic.

**Conclusions** Among women seeking abortion, women vulnerable to HIV infection outnumbered those with PrEP knowledge by 2 to 1. Prior knowledge of PrEP as an HIV prevention method was low, but women found PrEP acceptable.

## Key messages

- Among women seeking abortion care, women vulnerable to HIV infection outnumbered those with knowledge of pre-exposure prophylaxis (PrEP) as an HIV prevention strategy by 2 to 1.
- Among women seeking abortion care, PrEP as a method of HIV prevention was acceptable.

While women reported preferring to receive PrEP from a primary care provider, the abortion clinic visit may also represent an important time for HIV education and risk screening.

## INTRODUCTION

Approximately 468 000 American women were estimated to be at risk of HIV infection in 2014<sup>1</sup>; each year 7500 become infected.<sup>2</sup> In addition to traditional strategies that reduce exposure, such as condom promotion and treatment of infected individuals, more recently, the introduction of pre-exposure prophylaxis (PrEP), or the daily use of antiretroviral therapy by uninfected individuals vulnerable to HIV exposure, has offered a more effective user-controlled method of HIV prevention. When used properly, PrEP is highly effective, preventing infection in 90% of sero-discordant couples.<sup>3</sup> However, only less than 1% of at risk American women currently use PrEP,<sup>4</sup> highlighting the need for formative implementation research to

understand acceptability, feasibility and inform interventions to address this gap.

Existing evidence regarding American women's PrEP preferences demonstrates a general lack of awareness of PrEP.<sup>5</sup> This continues to be true among women seeking healthcare services,<sup>6–9</sup> and lies in contrast with the awareness of PrEP among the communities of men who have sex with men.<sup>8</sup> However, when women are made aware of PrEP, a majority would consider taking a daily medication to prevent HIV.<sup>6</sup>

A new avenue to reach women vulnerable to HIV infection is the introduction of PrEP at the time of abortion. Compared with women that receive prenatal care, women who terminate a pregnancy have a higher prevalence of HIV infection,<sup>10–13</sup> and therefore a likely increased prevalence of vulnerable behaviours. Such women could therefore benefit from assessment of HIV risk, as well as PrEP education, counselling, and provision or referral for PrEP care. We aimed to understand the knowledge of HIV risk and PrEP use among this vulnerable patient population, and to characterise their values and preferences to determine if the abortion visit is a time where PrEP education or referral would be acceptable.

## METHODS

### Ethics

The study was reviewed by the institutional review board of Northwestern University prior to participant recruitment and was found to be exempt.

### Study design

We performed a cross sectional descriptive study assessing the knowledge, attitudes, and preferences of women seeking abortion on HIV and PrEP between August 1 and October 30, 2018. Participants were recruited by convenience sample from a freestanding, urban family planning clinic in Chicago (Illinois, USA). Women were recruited to participate in an anonymous, self-administered, one time 10 min survey. Once a woman had completed her intake appointment, research staff approached her individually to introduce the study. Interested individuals were brought to a semi-private room where they could anonymously enter their eligibility criteria into an electronic survey for participation assessment. Women were eligible to participate if they were at least 18 years old, spoke English and were presenting for abortion care between 5 weeks 0 days and 23 weeks and 6 days gestation. Women with known HIV infection, those who had previously completed the survey, those unwilling or unable to consent and those unable to self-administer the survey as a result of language or literacy barriers were excluded. After screening questions were answered on the tablet, consent to participate was anonymously requested. If a woman elected to participate, the survey automatically continued. Each survey was given a unique study number, and no identifying

information was collected. The survey was administered and stored through REDCap (Research Electronic Data Capture), a secure, web based, electronic data capture application hosted by Northwestern University.<sup>14</sup> After completion of the survey, participants were remunerated with a \$20 gift card for their time. The survey was only administered in English.

### Patient and public involvement

Patients were not involved in the development of this study.

### Questionnaire

The survey was adapted for use in women seeking abortion from an existing knowledge, attitude and preference survey regarding HIV risk perception and PrEP use in women, created by one of the authors (LRH).<sup>15</sup> The survey focused on six domains: participant demographics, HIV risk behaviours, HIV knowledge, self-perceived HIV risk, PrEP knowledge and attitudes, and preferences for receipt of PrEP related care. Domains and example questions are presented in online supplemental table 1. Attitudes towards HIV and PrEP were assessed using a five point Likert scale from “strongly agree” (1) to “strongly disagree” (5). Behaviours that were considered indications for PrEP were taken from Centers for Disease Control and Prevention Clinical Practice Guideline,<sup>16</sup> and included those who had performed sex work, experienced a recent sexually transmitted infection, or had more than one recent sexual partner and inconsistent condom use.

### Analysis

A sample size calculation determined we needed 187 participants to provide a confidence interval of  $\pm 7\%$ , assuming 50% response to the question, “Before today, had you ever heard about PrEP?”, a confidence level of 95% and a population of 4000 patients per year. Recruitment was therefore planned for 200 patients.

We performed descriptive statistics of participant demographics as well as knowledge and attitudes of HIV and PrEP. Wilcoxon (Mann–Whitney) rank sum tests were used to compare HIV attitudes between PrEP candidates and non-candidates. Multiple logistic regression was used to examine the relationship between PrEP use and variables of interest while controlling for possible confounders such as HIV risk factors, insurance status, race and educational level. Forest plots were used to demonstrate the difference in odds ratio of interest of PrEP use for each variable of interest. A p value  $< 0.05$  was considered statistically significant for all analyses. As these analyses were purely exploratory in nature, we did not plan to account for multiple hypothesis tests. Analyses were conducted using SAS software V.9.4 (SAS Institute, Inc, Cary, North Carolina, USA) or R 3.3.3.

## RESULTS

Overall, 245 women were recruited for participation; 31 individuals declined participation and 14 were

ineligible. No participants were ineligible because of HIV(+) status. A total of 200 participants were recruited and completed the survey; two responses were lost, leaving 198 survey responses for analysis.

The demographic information of the study participants is presented in table 1. Almost two-thirds (65.7%) of participants self-identified as non-Hispanic Black and 8.6% as non-Hispanic white; 8.6% identified as Hispanic. Over one-half (56.2%) of participants reported at least some post-secondary education. The majority had public insurance and reported having a primary care provider.

With regard to the risk factors for HIV acquisition among the participants, 6.7% reported a diagnosis of gonorrhoea and 3.6% a diagnosis of syphilis in the last 6 months. Almost one-third (30.5%) had more than one vaginal sexual partner in the last 6 months, and only 4.3% of the participants reported always using condoms during vaginal intercourse in the last 6 months (table 1).

These risk factors resulted in 64 (32.3%) participants having indications for PrEP referral according to the Clinical Practice Guideline from the Centers for Disease Control and Prevention (figure 1).<sup>16</sup> The majority of participants with indications for PrEP referral met the criteria because they reported having more than one sexual partner in the last 6 months and less than perfect condom use (53 (82.8%)).

HIV knowledge assessment found a number of misconceptions (online supplemental table 2), with close to half (47.0%) of participants unaware that pregnancy and childbirth are times when HIV can be transmitted; 13.1% of participants believed that sharing a drinking glass could be a time when a person could acquire HIV and 16.6% of participants believed that there are medications that can cure HIV.

One in 10 (10.5%) participants self-assessed their risk of HIV infection as moderate or higher, and another 1 in 10 (11.3%) worried about becoming infected with HIV at least or more than a moderate amount of time (table 2). Participants who were candidates for PrEP therapy were more likely to estimate a higher chance of HIV infection than participants who were not candidates for PrEP therapy (median response 3 (“small”) (Q1–Q3 1–3) vs 1 (“zero”) (Q1–Q3 1–2),  $p < 0.01$ ) and were more likely to worry about infection with HIV (median response 2 (“rarely”) (Q1–Q3 1–3) vs 1 (“none of the time”) (Q1–Q3 1–2),  $p < 0.01$ ) (online supplemental table 3).

When participants were asked whether they had prior knowledge of PrEP, only 31 (16.1%) responded affirmatively. Only 5 (16.1%) of the participants with prior knowledge of PrEP received that information from a medical provider (table 2). Attitudes were assessed by participant’s agreement with sample statements as measured on a five point Likert scale, from strongly agree to strongly disagree. Attitudes towards PrEP were generally positive; for example,

**Table 1** Demographics of survey participants

Characteristic	Median (Q1–Q3) or n (%)
Age (years) (n=198)	26 (22–30)
Race (n=198)	
Non-Hispanic Black	130 (65.7)
Non-Hispanic white	17 (8.6)
Hispanic	17 (8.6)
Other	34 (17.2)
Education (n=194)	
Less than high school	1 (0.5)
Some high school	13 (6.7)
High school or general education degree	71 (36.6)
Some college	83 (42.8)
Bachelor’s degree	20 (10.3)
Graduate degree	6 (3.1)
Health insurance (n=193)	
Private	37 (19.2)
Public	128 (66.3)
Other	5 (2.6)
No	22 (11.4)
Don’t know	1 (0.5)
Sexually transmitted infections (n=193)	
Chlamydia	17 (8.8)
Gonorrhoea	7 (3.6)
Syphilis	4 (2.1)
Vaginal sex partners in the last 6 months (n=190)	
1	132 (69.1)
2	45 (23.6)
3 or more	13 (6.9)
Condom use during vaginal sex (n=141)	
Always	6 (4.3)
Most of the time	19 (13.5)
Sometimes	49 (34.8)
Never	67 (47.5)
Anal sex partners in the last 6 months (n=189)	
0	154 (81.5)
1	30 (15.9)
2 or more	5 (2.6)
Exchanged sex for money, drugs, gifts or housing in last 6 months (n=193)	
Yes	3 (1.6)
No	189 (97.9)
I don’t want to respond	1 (0.5)
Regular healthcare provider or clinic (n=194)	
Yes	153 (78.9)
No	41 (21.1)
Location of regular healthcare provider or clinic (n=153)	
Health centre	36 (23.5)
Doctor’s office	101 (66.0)

Continued

Characteristic	Median (Q1–Q3) or n (%)
Health management organisation	4 (2.6)
Pharmacy clinic	5 (3.3)
Emergency department	1 (0.7)
Somewhere else	6 (3.9)

the median response was “agree,” to the statements, “People who are on PrEP are making a smart decision to protect their health” and “PrEP is highly effective at preventing HIV if taken every day.” There was limited stigma, with 58.4% disagreeing with the statement, “People who are on PrEP sleep around.” Just over a quarter (27.8%) of participants reported they might, probably or definitely would start taking PrEP in the next 6 months (table 2 and online supplemental table 2).

We performed a multiple logistic regression to predict the participants who would be most interested in starting PrEP. The odds of starting PrEP in Black women was 2.133 times higher (95% CI 1.008 to 4.513,  $p=0.0475$ ) (figure 2), compared with other races when controlling for HIV risk factors, insurance status and education level.

With regard to preferences for PrEP care, participants were most likely to report wanting to receive information on PrEP from their primary care provider (50.0%) or from a family planning clinic (50.5%); participants also reported these two care locations to be trusted information sources (online supplemental table 2). These settings were also where participants would prefer to start PrEP care (primary care provider 59.9%, family planning clinic 25.0%). Participants listed side effects (67.7%), therapeutic compliance (25.3%) and cost (21.7%) as the most common concerns regarding PrEP implementation.

## DISCUSSION

We found that PrEP knowledge among women seeking abortion care in our study was low, but attitudes towards its use were generally positive. Twice as many participants had indications for PrEP as were aware of its existence; and a similar proportion were interested in initiating care. Study participants would like to receive information regarding PrEP as well as PrEP care from their primary care provider.

To our knowledge, this is the first study assessing the knowledge, attitudes and preferences regarding PrEP care among women seeking abortion. Women presenting for abortion care have an increased prevalence of risk factors for HIV acquisition compared with women seeking prenatal care.<sup>10–13</sup> Given the commonality of abortion,<sup>17</sup> this is an important population to understand. Our finding of low prior knowledge of PrEP, in comparison with vulnerable male populations (67%),<sup>18</sup> is similar to previous studies of heterosexual women performed at sexually transmitted disease and family planning clinics (9–27%).<sup>8,9,18</sup> Interest in PrEP in our study was lower than assessed in two of these studies (57–60%). While this may reflect the difference in setting, it is also possible the assessment of interest with a scale rather than a bivariate response had an influence.

Our findings also demonstrated that Black race was predictive of an increased interest in PrEP use compared with non-Black participants, similar to other studies on PrEP acceptability.<sup>6,19</sup> The interest in receiving PrEP care from a trusted clinician, such as a primary care provider, was similar to the sentiments expressed by participants in a recent focus group analysis of family planning clinic attendees in the Southern US.<sup>9</sup> Our participants did not wish to receive this care in an abortion clinic, which may represent their perceived stigma associated with abortion provision. Further research on implementation should focus on how

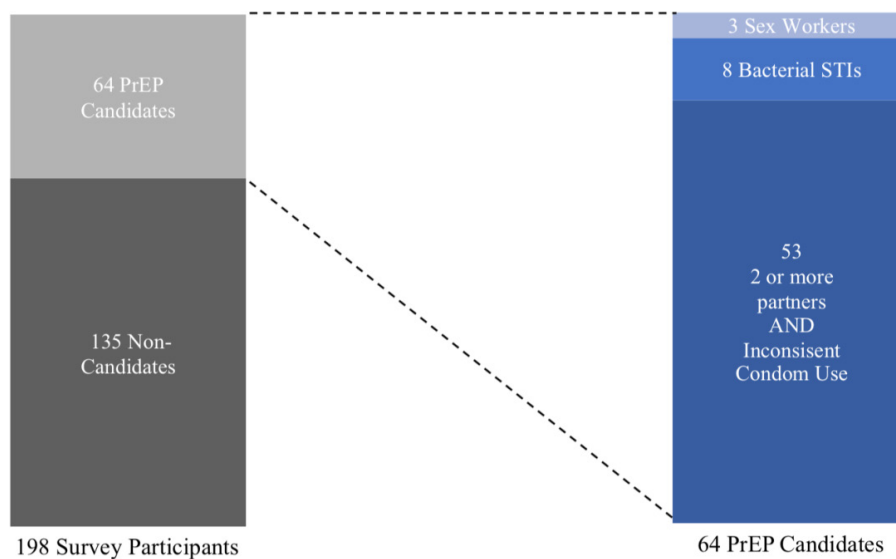


Figure 1 Pre-exposure prophylaxis (PrEP) candidate flow diagram. STIs, sexually transmitted infections.



**Table 2** Select HIV and pre-exposure prophylaxis knowledge, attitudes and preferences

Attitudes, knowledge and preferences	n (%)
HIV attitudes	
"I think my chances of getting infected with HIV are:" (n=193)	
Zero	96 (49.7)
Almost zero	35 (18.1)
Small	42 (21.8)
Moderate	14 (7.3)
Large	3 (1.6)
Very large	3 (1.6)
"I worry about getting infected with HIV:" (n=193)	
None of the time	91 (47.2)
Rarely	52 (26.9)
Some of the time	28 (14.5)
A moderate amount of time	8 (4.1)
A lot of the time	7 (3.6)
All of the time	7 (3.6)
PrEP knowledge	
"Before today, had you ever heard about PrEP?" (n=193)	
Yes	31 (16.1)
No	145 (75.1)
I don't know	17 (8.8)
Where did you hear about PrEP? (n=31)*	
Advertisement	10 (32.3)
Friend/family	6 (19.4)
Online/social media	9 (29.0)
Medical provider	5 (16.1)
HIV counsellor	2 (6.5)
Somewhere else	9 (29.0)
Has a medical provider ever told you to consider taking PrEP? (n=31)	
Yes	1 (3.2)
PrEP attitudes† (1=strongly agree, 5=strongly disagree)	
"HIV(−) individuals who are at high risk of HIV infection should take PrEP." (n=194)	1 (1–2)
"PrEP is highly effective at preventing HIV if taken every day." (n=194)	2 (1–3)
"PrEP is only for men who have sex with men or gay men." (n=193)	5 (4–5)
PrEP preferences	
"How likely do you think it is that you will start taking PrEP in the next 6 months?" (n=194)	
Definitely will not take PrEP	30 (15.5)
Probably will not take PrEP	36 (18.6)
Might take PrEP	35 (18.0)
Probably will take PrEP	9 (4.6)
Definitely will take PrEP	10 (5.2)
Don't know	74 (38.1)

Continued

**Table 2** Continued

Attitudes, knowledge and preferences	n (%)
"If you wanted to get information on PrEP, where would you want to get that information?" (n=198)*	
Friend/family	22 (11.1)
Regular primary care provider	99 (50.0)
Another doctor or nurse	52 (26.3)
Family planning clinic	100 (50.5)
Another clinic or medical provider	45 (22.7)
Internet/social media	63 (31.8)
HIV prevention organisation	81 (40.9)
Somewhere else	14 (7.1)
"If you were to start PrEP, where would you want to have your first PrEP related visit?" (n=192)	
My regular primary care provider	115 (59.9)
Family planning clinic	48 (25.0)
STI† clinic	9 (4.7)
Pharmacy	3 (1.6)
Abortion clinic	3 (1.6)
Somewhere else	14 (7.3)

Questions have variable response rates as participation in each question was voluntary and participants could opt not to respond.

\*Response is "choose all that apply," so will sum to greater than 100%.

†Response is scale of 1–5, where 1=strongly agree, 5=strongly disagree.

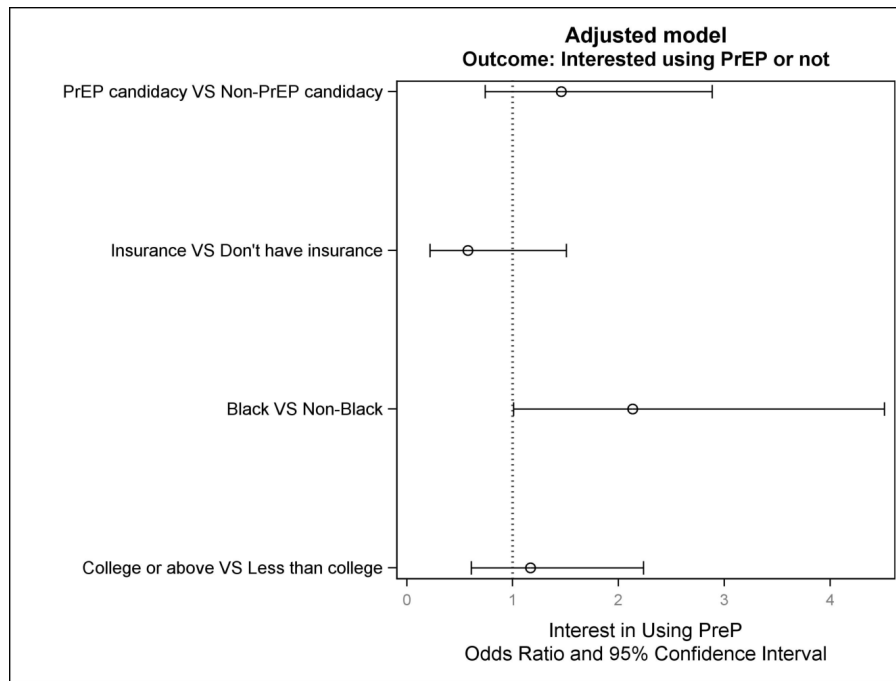
PrEP, pre-exposure prophylaxis; STI, sexually transmitted infection.

women seeking abortion and at risk for HIV would envision the most efficient and effective process of referral for PrEP care, especially as same day initiation has shown promise in other vulnerable populations.<sup>20</sup>

While we were most interested in identifying avenues to increase PrEP uptake in a population with significant need, further work will need to explore possible unintended consequences of its use in vulnerable women. This could include an increase in behaviours that would put the user at risk of pregnancy and acquisition of sexually transmitted infections, or exposure to an unnecessary medication.<sup>21</sup> Interestingly, while a quarter of participants identified adherence as a concern if they were to take PrEP, only a few participants felt that PrEP would increase risky behaviours (online supplemental table 2).

### Limitations

Our study had a number of limitations. This is a descriptive study with a relatively small sample size of English speaking women seeking care in one city and one clinic, which limits the generalisability of the response data. Our participants' knowledge, attitudes and preferences likely do not represent those of rural or coastal American women, or immigrant women. We collected a convenience sample, which can cause selection bias. Although declinations to participate were low, it is possible the nominal remuneration attracted more low income participants than is representative of



**Figure 2** Association between respondent demographics and reported interest in using pre-exposure prophylaxis (PrEP).

the larger clinic population. We did not collect demographic information on women who declined participation to provide comparison. Finally, as this was cross sectional in design, we are unable to determine if the exposure variables we examined, such as race, education and sexual risk behaviours, preceded the outcome variables of interest, such as the HIV risk perceptions and PrEP interest of the participants.

## CONCLUSION

Knowledge of PrEP as a method of HIV prevention continues to be low among US women, but acceptability of PrEP in the same population is high. In our current study, patients seeking care at a freestanding abortion clinic reported a number of risk factors for HIV infection. Given these findings, women presenting for abortion may represent an important population to target for HIV and PrEP education. Further research is needed to understand risk factors for HIV acquisition as well as knowledge of and attitudes towards PrEP in a larger and more diverse population of women seeking abortion. These studies can further advance insights into the potential role of abortion clinics in increasing uptake of PrEP, and inform implementation strategies to best reach PrEP-eligible women in this setting. Evaluation of the knowledge and attitudes of abortion providers to inform training and other support to provide PrEP referral is needed.

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**Competing interests** None declared.

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**Patient consent for publication** Not required.

**Ethics approval** This study was reviewed by the institutional review board of Northwestern University prior to participant recruitment and was found to be exempt.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** No data are available. Deidentified participant data are stored in REDCap, licensed by Northwestern University. Data can be made available after a data use agreement between institutions is arranged and approved by Northwestern's Office of Sponsored Research.

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