



Intimate Partner Violence, HIV Pre-Exposure Prophylaxis (PrEP) Acceptability, and Attitudes About Use: Perspectives of Women Seeking Care at a Family Planning Clinic

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Abstract

Pre-exposure prophylaxis (PrEP) presents an opportunity to expand prevention options for women at risk for HIV infection. Yet, women's PrEP use remains low and relatively little is known about PrEP acceptability and attitudes among a sub-population of women at risk for HIV—those experiencing intimate partner violence (IPV). A cross-sectional survey included closed and open-ended questions to assess IPV, PrEP acceptability, and attitudes about PrEP use among women seeking care at an urban family planning clinic in Pittsburgh, Pennsylvania ($N=145$). Approximately 70% of women reported being willing to use PrEP with the key reasons for potential use including previous STI diagnosis, inconsistent condom use, and lack of or dishonest conversations with partners. Among women reporting recent IPV (41%), potential barriers to PrEP included concerns around drug effects, access/affordability, and adherence. Over half of women reporting recent IPV reported concerns around partner reaction impacting potential PrEP use. Results from this mixed-methods study highlight the need for a woman-centered PrEP intervention that uniquely includes awareness raising and understanding of PrEP for women, as well as reflects the context of IPV in decision-making and care.

Keywords Pre-exposure prophylaxis (PrEP) · HIV prevention · Intimate partner violence · Women

Introduction

Pre-exposure prophylaxis (PrEP), a daily oral emtricitabine-tenofovir (Truvada) medication, is a promising biobehavioral HIV prevention method used to reduce HIV incidence among people who are uninfected but at high risk for HIV infection [1–3]. The emergence of PrEP presents a new opportunity for a woman-controlled HIV prevention strategy [4–6], yet use remains low. In the United States, only 7% of PrEP users are women despite representing 19% of all new HIV diagnoses [7]. As recognition of the value of PrEP use for HIV prevention among women grows, researchers are increasingly exploring issues related to women's PrEP

acceptability and willingness to use the medication [6, 8–11].

PrEP expands the HIV prevention options for women in abusive or controlling relationships. In particular, PrEP offers several advantages over other existing prevention strategies for women experiencing IPV, including autonomous or covert use and not needing to be taken at time of sexual activity [12]. For example, PrEP, unlike condoms, is not partner dependent, allowing women to use without their partner's involvement or knowledge. Further, oral PrEP allows women to discreetly use the prevention method and is likely preferred over other PrEP formulations (e.g., vaginal microbicides) which may create additional lubrication and concerns that partners would be able to tell when they were used [9, 13]. Since PrEP does not need to be taken right at the time of sexual activity for prevention is also important as women experiencing IPV may not have control over when or how a sexual encounter occurs.

Substantial evidence from other existing and experimental HIV prevention methods highlights how IPV significantly constrains women's acceptability and use of prevention methods (e.g., male and female condoms, vaginal

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microbicides) [9, 13–17]. For example, IPV limits women's ability and self-efficacy to request or negotiate condom use [14, 15], willingness to use vaginal microbicides [13], and desire to use microbicides covertly to avoid arguments, accusations of infidelity, or more abuse [16]. Yet, despite the advantageous of PrEP for women's use within contexts of IPV, limited research has explicitly focused on the complex and intersecting issues of PrEP acceptability among women in violent intimate relationships. An enhanced understanding of the considerations necessary for PrEP delivery and implementation in the context of IPV, including PrEP acceptability and attitudes about use, is crucial. Existing research suggests that women who have experienced IPV may be concerned about their partner interfering with their PrEP use [18, 19] and that IPV may have implications on PrEP adherence [18]. Future investigation should include an examination of factors such as how IPV may impact women's PrEP decision-making and adherence concerns, fears associated with partner, or underestimated risk of HIV and prevention.

Women's health care settings, such as OB/GYN practitioners and family planning clinics, are being increasingly recognized as important settings for discussing IPV and HIV prevention [20]. Sexual and reproductive health care settings are often women's source of usual care [21], where women seek care regularly and for a variety of services (e.g., contraception, STI testing and treatment, pregnancy-related services, cancer screening, referrals) [22], and who provide care to un- or under-insured women who may not be seeking healthcare elsewhere [21, 22]. Furthermore, women identify family planning clinics as a comfortable setting for discussing sexual behavior, IPV, and HIV prevention [20, 23], and a setting that they would specifically like to receive PrEP [8].

The current study uses quantitative and qualitative data drawn from a sample of women seeking care at an urban family planning clinic to: (1) explore HIV risk, PrEP acceptability, and attitudes about PrEP use and (2) examine the impact of recent IPV experience on PrEP acceptability and attitudes.

Methods

Study Design

This mixed methods study examines cross-sectional survey data collected from women seeking care at a family planning clinic in Pittsburgh, Pennsylvania from September 2018 to January 2019. The study clinic has been offering PrEP for free or at low-cost to those without health insurance since 2017 and routinely screens patients for intimate partner violence. Eligible women who presented for care during data collection were recruited to participate prior to their clinic visit. Patients were eligible for the study if they were female,

18 years of age or older, able to read English, reported sex with a male partner within previous 12 months, and concerned about HIV infection or interested in HIV prevention. The HIV concern inclusion criteria ensured that the sample was knowledgeable and/or interested in learning about PrEP as a HIV prevention method. Clinic staff shared study recruitment flyers with all women at check-in. The flyers provided a brief description of the study, the inclusion criteria, a statement about compensation, and next steps for those interested. Women were given the choice to complete the survey at the clinic using an electronic tablet or online; an online survey link was included on the flyer for those interested in completing the survey outside of the clinic setting. The PI (TLO) was at the study clinic during the recruitment period and provided additional information to those who expressed interest or had questions about the study.

Informed consent and eligibility screening were completed prior to survey administration. Informed consent, eligibility screening, and the survey were all done using the secure, web-based survey service Qualtrics [24]. Eligible participants completed a self-administered brief anonymous survey that took 10–15 minutes to complete. Women who participated in-person utilized a password protected electronic tablet in the clinic waiting room; those who participated outside the clinic via the online survey link utilized personal electronic devices. Following survey completion, participants were provided with a list of local resources (e.g., support services for IPV, mental health, and HIV) and given \$10.00 as a thank you for their participation. All study materials and protocols were approved by the University of Pittsburgh Institutional Review Board.

Measures

The survey included a mix of closed and open-ended questions and all data were self-reported. Close-ended measures were selected based on existing PrEP acceptability evidence, known factors influencing HIV risk, and when available, established valid and reliable measures. Open-ended questions were developed for this study and designed to capture context around willingness to use PrEP. The open-ended questions did not force a response in order to proceed through the survey, yet over 98% of participants responded to at least one open-ended question.

PrEP Acceptability, Awareness, and Use

PrEP acceptability was measured through a single item of willingness to use PrEP on a 4-point scale ranging from “no, definitely not” to “yes, definitely”. Specifically, the item asked, “Would you be willing to take a pill every day if you could protect yourself from getting HIV during sex?” and was informed by previous work in the PrEP field [19, 23,

25, 26]. A brief description of PrEP was provided immediately before the question and included facts on what PrEP is, how it is administered and functions, potential side effects, follow-up requirements, and associated costs. The responses were then collapsed into a dichotomous indicator of PrEP acceptability variable where acceptability was indicated as yes to the responses of probably or definitely willing to use PrEP. An open-ended question asked about reasons why participants would be willing/not willing to use PrEP and was based on their PrEP acceptability response. For example, additional description of why participants were willing to use PrEP was requested of those who indicated that they would “yes, probably” or “yes, definitely” be willing to use PrEP and were asked to respond to the following question: “We are interested in understanding more about your willingness to use PrEP. In the space below, please tell us more about why you would be willing to use PrEP.” PrEP awareness and use were assessed via four questions, including aware of PrEP, know others who have used PrEP [26, 27], as well as previous or current use of PrEP (developed by study team).

PrEP Attitudes

Attitudes towards PrEP were assessed with items drawn from existing PrEP research, including 28 items from Holloway and colleagues [27], who identified eight unique factors to assess attitudes about PrEP using principal component analysis (i.e., access/affordability, stigma, drug effects, perceived benefits, risk compensation, lack of perceived need, mistrust, and adherence). Six additional statements were added to be reflective of women’s HIV prevention within an IPV context (e.g., covert use, in control of HIV prevention, partner reaction) [9, 12, 28, 29]. Specifically, the statements: “PrEP would allow me to be in control of protecting myself from getting HIV” to the category perceived benefits and “It would be difficult for me to take a pill every day because I would hide it from my sexual partner(s)” to adherence. Four items comprised a new category (partner reaction) which included known factors related to women’s use of HIV prevention strategies (e.g., suggestion of infidelity, dishonesty, or a casual attitude toward one’s partner) to explore attitudes towards partner reactions impacting women’s PrEP acceptability [12, 29]. Participants were asked to rate their agreement on 4-point scale ranging from “strongly disagree” to “strongly agree” to the 34 statements about their attitudes towards willingness to use PrEP. The statements were asked across nine categories: (1) access/affordability (6 items; e.g., “I wouldn’t be able to afford PrEP”), (2) stigma (5 items; e.g., “I would be concerned about my sexual partner(s) finding out if I started taking PrEP”), (3) partner reaction (4 items; e.g., “I would be concerned that my sexual partner(s) would think I was having sex with other people if I started

taking PrEP”), (4) drug effects (5 items; e.g., “I am concerned about side effects or feeling sick from taking PrEP”), (5) perceived benefits (5 items; e.g., “Taking PrEP would be a good way to protect myself from getting HIV), (6) risk compensation (2 items; e.g., “I am concerned that I would take more sexual risks if I started taking PrEP”), (7) lack of perceived need (2 items; e.g., “I don’t need PrEP because I’m not at risk for getting HIV”), (8) mistrust (2 items; e.g., “I don’t trust drug companies”), and (9) adherence (3 items; e.g., “It would be difficult for me to remember to take PrEP every day”). Items were reverse coded so that higher scores reflected increased perception of the items as being a barrier to potential PrEP use. A summary dichotomous variable was created for each of the nine categories where barrier attitudes were indicated by agreement (i.e., strongly agree or agree) with at least one statement within each category.

Open-ended questions asked participants to describe perceived factors, such as relationship, community, or society factors, impacting women’s willingness to use PrEP. For example, participants were asked: “What are some other relationship things that may impact, positively or negatively, a woman’s willingness to use PrEP?”.

Intimate Partner Violence

Intimate partner violence experience was assessed with items drawn from the Revised Conflict Tactics Scale Short Form [30] and existing relevant work [15]. Eight dichotomous (yes/no) items assessed experience of physical (2 items; e.g., “partner pushed, shoved, or slapped you”), sexual (4 items; e.g., “partner insisted on sex when you did not want to”), and psychological (2 items; e.g., “partner insulted or swore or shouted or yelled at you”) IPV by any male sexual partner (e.g., a date, boyfriend, husband, or any other sexual partner). All items assessed IPV experience within the previous 12 months. Summary dichotomous variables were created for any experience of IPV within the previous 12 months, as well as across each violence type.

HIV Risk Behaviors and Perceptions

Five individual measures assessed HIV risk behaviors and were drawn from existing relevant work. HIV risk behaviors were measured with consistent condom use (i.e., frequency of use during vaginal or anal sex with a man) [31]; STI diagnosis [15]; and number of male sexual partners, transactional sex, and sex with partner of unknown HIV status [32]. All five items were assessed for within the previous 12 months. For example, STI diagnosis was measured according to how many times participants had tested positive for an STI (e.g., been told by a doctor or health care professional that they had a sexually transmitted infection (such as chlamydia, gonorrhea, syphilis, herpes, genital warts, or Hepatitis B))

[15]. HIV-related risk perception was measured through two questions of previous HIV testing (developed by study team) and HIV worry in the next six months [23].

Sociodemographic Characteristics

Participant characteristics included age, race, ethnicity, sexual orientation, education, income, relationship status, health insurance, and reason for clinic visit. Participants indicated their race by selecting one or more of the following categories: American Indian or Alaska Native, Black or African American, Native Hawaiian or Other Pacific Islander, White, and Other. Race was collapsed into three categories due to small numbers across categories.

Analysis

Quantitative

Responses to the close-ended measures were used to generate frequencies and bivariate associations between barriers to PrEP acceptability and recent IPV experience. Multiple logistic regression models were then used to examine the relationship between PrEP acceptability (i.e., willingness to use) and PrEP attitudes while adjusting for potentially confounding variables. Separate regression models were then generated for recent IPV, controlling for age, race, ethnicity, sexual orientation, and education. Analyses were conducted in StataSE (v.15.1), and statistical significance was set at $p \leq 0.05$.

Qualitative

Text responses from the open-ended questions were classified by the project PI (TLO) using broad thematic codes consistent with study aims. Specific codes related to the topic of interest (e.g., attitudes towards PrEP use) were then examined for recurring sub-themes (e.g., fear of side effects). Illustrative qualitative quotes are used in the results section to elaborate on and provide context to the quantitative findings addressing PrEP acceptability and attitudes about use. QSR International's Nvivo 12 qualitative data analysis software [33] was used to manage, code and extract the text data.

Results

Participant Characteristics

Table 1 presents descriptive characteristics of the 145 female study participants. A majority of participants had a college degree or more (55%), earned less than \$20,000 annually (57%), and identified as white (72%). Approximately 10% of

women identified as Hispanic or Latina. The average age of participants was 25 years. Approximately a fifth (19%) of the participants did not have health insurance, and 38% received Medicaid/Medical Assistance. Close to half of the participants were in a serious relationship (42%), while the others described their relationship status as casually dating (40%) or single (18%). One fifth of participants (20%) reported coming to the clinic for STI testing and services.

HIV Risk

A third of women (33%) reported more than two male sexual partners in the past 12 months (Table 1). Over three-quarters (86%) engaged in inconsistent or no condom use in the past 12 months. Past-year STI diagnosis was reported by 15%. One-fifth (21%) of women reported sex in the past 12 months with a male partner whose HIV status was unknown; 6% reported their current partner at risk of HIV through sexual or drug using behavior; and 2% had traded sex or sexual acts within the past 12 months in exchange for money, drugs, shelter, gifts, or other resources. A majority (80%) of women had received an HIV test in their lifetime. Almost a third (31%) were a little or very worried about HIV infection in the next six months.

PrEP Acceptability

Two participants reported using PrEP previously (Table 1). A little over a third (35%) had heard of PrEP prior to study participation, and 13% reported knowing someone who had taken PrEP previously. Approximately 70% of participants reported that they would be willing to take PrEP. When asked to describe, in response to an open-ended question, reasons why they would be willing to use PrEP, participants' responses included description of poor outcomes from sex such a previous STI diagnosis, as well as an identification of their risk and concern for their sexual health. For example, one participant described the following as why they would be willing to use PrEP:

I am someone who usually participate[s] in unprotected sex. I was in a relationship for over a year and was active with just that person. He recently cheated and gave me gonorrhea. We broke up but occasionally and stupidly I have casual sex with this individual. So, I worry about my health sometimes due to our history. Also, before reading the information about HIV I never really thought about my chances of getting it because I thought it's commonly found in the LGBT community.

Women also described how their own HIV risk behaviors affected their interest in using PrEP: "I would be willing to use due to [my] inconsistent usage of condoms and amount of partners in the past 12 months", "I am very interested in

Table 1 Characteristics of women seeking care at a family planning clinic

	Total <i>n</i> = 145 (100%) <i>n</i> (%)	Recent IPV <i>n</i> = 59 (40.7%) <i>n</i> (%)
Age, years [mean (range)]	25.2 (18–45)	24.9 (18–40)
Race		
Black or African American	23 (15.8)	9 (15.2)
White	104 (71.2)	41 (71.1)
Asian, Multiracial, and All Other Races	18 (12.4)	8 (13.6)
Ethnicity		
Hispanic or Latina	15 (10.3)	5 (8.47)
Sexual orientation		
Heterosexual	96 (66.2)	33 (56.0)
Lesbian, bisexual, queer, pansexual, other	49 (33.8)	26 (44.1)
Education completed		
Less than college	64 (44.1)	36 (61.0)
College degree or more	81 (55.8)	23 (38.9)
Income status		
Less than \$20,000	82 (56.9)	35 (59.3)
\$20,000 or more	62 (43.1)	24 (40.6)
Relationship status		
Single	26 (17.9)	11 (18.6)
Casually dating	57 (39.3)	23 (38.9)
Serious relationship, including marriage	62 (42.7)	25 (42.3)
Sexual partners		
2 or less	88 (60.6)	33 (55.9)
More than 2	57 (39.3)	26 (44.1)
Condom use		
Never or inconsistently	124 (85.5)	58 (98.3)
Every time	21 (14.4)	1 (1.69)
STI diagnosis		
None	122 (84.1)	49 (83.1)
At least once	23 (15.8)	10 (16.9)
Sex with partner of unknown HIV status		
None	115 (79.3)	44 (74.5)
At least once	30 (20.6)	15 (25.4)
HIV worry		
Not worried at all	100 (68.9)	36 (61.0)
A little or very worried	45 (31.0)	23 (38.9)
Aware of PrEP		
No	94 (64.8)	43 (72.8)
Yes	51 (35.1)	16 (27.1)
Know others who have used PrEP		
No	126 (86.8)	11 (68.7)
Yes	19 (13.1)	5 (31.3)
Willing to use PrEP		
No	44 (30.3)	17 (28.8)
Yes	101 (69.6)	42 (71.1)

protecting myself in any way I can. I casually date and some of my male partners also have had male partners in the past and I would like to be as safe as possible”, and “I am sexually active and the person I am with has no interest in using

condoms though I have them”. A lack of communication with sexual partners or not knowing when partners lie, and opportunity to be in control of one’s HIV prevention, was also described as reasons for a willingness to use PrEP:

I do not always talk to my partners about their sexual history before having sex. I also don't always know if my partners are telling me the whole truth about their sexual histories. I would feel more in control of my own health by taking PrEP.

PrEP Attitudes

Women identified a number of issues that might impact their willingness to use PrEP (Table 2). PrEP drug effects was the most frequently indicated barrier to women's potential PrEP use, reported by 93% of participants. When asked, in an open-ended question, to further explain potential factors impacting women's PrEP acceptability, women described specific concerns for perceived drug effects, including the short and long-term side effects and newness of PrEP. For example, one participant stated the following:

One of my main concerns before taking any medicine is of the short and long-term side effects. Especially in new medications that haven't been around for a long time, it is pretty much impossible to know all of the side effects and there are numerous examples in history of drugs that seemed safe being devastatingly the opposite. Anyway, I would just want to know what's in the drug before I take it, and all available info so I could feel fully informed of the decision and the accompanying risks I would be taking. Which is funny because it's not like I am this careful about other stuff I put in my body.

Over half of women identified adherence concerns (63%) as a barrier to PrEP use and frequently described in the open-ended questions issues around prescription requirement (e.g., daily dosing) and frequency of follow-up visits. For example, one participant wrote, "I would be more willing to use [PrEP] if it wasn't a daily pill. If it was a shot I

would be more willing" and another reported, "My willingness to take PrEP may be affected just by the amount of times I would need to see a doctor". Issues of PrEP access/affordability was often identified, with 61% of women indicating it would impact their potential use of PrEP. In the qualitative data, women described concerns of cost, insurance, and transportation to doctors' visits when elaborating on perceived factors impacting willingness to use PrEP.

Almost half of women selected partner reaction (44%) as a barrier to their willingness to use PrEP and frequently expressed in open-ended questions accusations of cheating, mistrust by partners, and fear of partner finding out about PrEP use as impacting women's PrEP decision-making: "A woman's significant other can accuse her of cheating or leave her if they found out or take offense" and "They might be afraid to tell their partner or them finding out". As illustrated in the following quote, women's concern about their partner's reaction to taking PrEP might influence her decision to use PrEP even when there were HIV risk concerns:

Partners jealousy or suspicion I feel would likely make women less likely to want to take PrEP even if she was possibly [at] risk [for HIV].

Intimate Partner Violence

Over 40% of women reported any recent (past 12 months) intimate partner violence. Most women who reported recent IPV specified psychological partner violence (33%), followed by sexual violence (20%); approximately 10% of women had a recent history of physical violence. Table 2 describes the relationship between participants' experiences with recent IPV and their PrEP attitudes. Among women disclosing recent IPV, barriers impacting potential PrEP use most frequently identified included drug effects (96%), access/affordability (76%), adherence (74%), partner reaction (54%), and stigma (49%). Lack of perceived need was identified the least (28%).

Intimate Partner Violence and PrEP Attitudes

Recent IPV experience was significantly associated with a number PrEP attitudes in bivariate analyses, including access/affordability, stigma, partner reaction, and adherence. Women who reported recent IPV were more likely than those who did not to express concerns about PrEP access and affordability (OR 3.21; 95% CI 1.54–6.69, $p < 0.01$), and specific factors of price, insurance, and unreliable healthcare were described by women with recent IPV as factors impacting PrEP acceptability. Recent IPV experience was significantly associated with stigma as a barrier to PrEP use (OR 2.00; 95% CI 1.01–3.95, $p < 0.05$). In response to the open-ended associated question, one participant noted, "Society

Table 2 Attitudes towards PrEP use among women seeking care at a family planning clinic

PrEP Attitudes	Total $n = 145$ (100%) n (%)	Recent IPV $n = 59$ (40.7%) n (%)
Access/affordability	88 (60.6)	45 (76.2)
Stigma	57 (39.3)	29 (49.1)
Partner reaction	64 (44.1)	32 (54.2)
Drug effects	135 (93.1)	57 (96.6)
Perceived benefits	46 (31.7)	19 (32.2)
Risk compensation	64 (44.1)	26 (44.1)
Lack of perceived need	53 (36.5)	17 (28.8)
Mistrust	50 (34.4)	25 (42.3)
Adherence	91 (62.7)	44 (74.5)

may think [a] woman already has HIV rather than prevention” and another stated, “The stigma of women hav[ing] many sexual partner[s] plays a part in women taking advantage of things like this”.

Women reporting recent IPV were also significantly more likely to identify partner reaction as a barrier to potential PrEP use compared to women not disclosing recent IPV (OR 2.00; 95% CI 1.01–3.92, $p < 0.05$). Qualitative text from women who reported recent IPV experience highlights accusations of cheating as barriers to women’s PrEP acceptability: “If their partner was abusive emotionally or physically he or she may accuse them of things they aren’t guilty of.” As illustrated in the following quote, abusive partners in general were also described as impacting women’s willingness to use PrEP:

The type of relationship, monogamous or open/casual, as well as the safety and degree of open mindedness within the relationship (for example, a partner who is manipulative or pressures the other into doing things sexual or otherwise). Also, the uncomfortable discussion it may bring up.

Women reporting recent IPV were also more likely to identify concerns about adherence as a barrier to PrEP use compared to women who did not report recent IPV (OR 2.43; 95% CI 1.18–5.01 $p < 0.05$). Consistent healthcare, high pill burden, and follow-up required were described in the open-ended questions as specific adherence barriers among women disclosing recent IPV. One participant stated, “Women already face much of the responsibility for birth control so adding another pill to their regimen might be a pain.” Recent IPV experience was not significantly associated in bivariate analyses with PrEP attitudes of perceived benefits, risk compensation, perceived need, and mistrust.

Intimate Partner Violence, PrEP Attitudes, and PrEP Acceptability

Results from multivariable logistic regression analyses exploring the relationship between PrEP attitudes and PrEP acceptability are presented in Table 3 for the total sample and for the sub-sample of women who reported recent IPV. After controlling for age, race, ethnicity, sexual orientation, and education among women who reported recent IPV, those who identified mistrust of drug companies and healthcare providers were less willing to use PrEP compared to those who did not identify mistrust as a barrier (AOR 0.22; 95% CI 0.06–0.89, $p < 0.05$). Lack of perceived need and perceived benefits were statistically significant with willingness to use PrEP (i.e., acceptability) regardless of recent IPV experience. The qualitative text comments highlight how many women do not perceive a need for PrEP because they do not consider themselves at risk for HIV. One participant

noted: “Many women may think that being heterosexual is a protective factor against HIV”. And another pointed to the continued need for information and education to help women understand HIV risk: “I think most women aren’t fully aware of their risk of HIV. So if more women learned about their risk I think it would be good for society as more people are protected.”

Discussion

This mixed methods study contributes important information about women’s PrEP attitudes and acceptability, and to the increasing research investigating the potential for PrEP to expand HIV prevention options for women in abusive and controlling relationships. These results provide guidance on women’s attitudes towards PrEP use, willingness to use, and the relationship between IPV and PrEP acceptability. This study also supports the feasibility of discussing IPV experiences and PrEP interest with women, as well as the perceived barriers to PrEP decision-making within the context of IPV. PrEP acceptability was high with 70% of this sample of women seeking care at an urban family planning clinic reporting a willingness to use PrEP to protect against HIV. While awareness of PrEP was low prior to study participation, women were generally supportive of PrEP once they learned more about it. The open-ended survey questions provide context of how women’s willingness to use PrEP is related to such things as a STI diagnosis, inconsistent condom use, number of partners, and lack of or dishonest conversations with partners. These study results are fairly consistent with existing research including a nationally representative survey of U.S. women which found a high acceptability of PrEP, where 64% of women aged 20–29 years and 59% of women aged 30–45 years reported they would take a daily pill to prevent HIV [6]. Among 191 U.S. women recruited through online and community flyers, approximately a quarter (25%) of those who reported IPV within the past six months were aware of PrEP and 45% were interested in learning more about PrEP [34]. Braksmajer et al.’s [28] study involving in-depth interviews with 26 women disclosing IPV within the past six months in the United States found that approximately half of participants expressed an interest in taking PrEP.

Women identified drug effects, adherence, access and affordability, and partner reaction as primary barriers impacting their willingness to use PrEP. Women’s description of factors impacting PrEP acceptability in the open-ended questions illustrate specific concerns of things such as short and long-term side effects, newness of PrEP, drug prescription requirements (e.g., daily dosing), frequency of follow-up visits required, cost, insurance, and transportation to doctor visits. Study results are consistent with existing

Table 3 Multivariable logistic regression of attitudes on PrEP acceptability among all participants and those reporting recent IPV

Models ^a	Total (<i>n</i> = 145) AOR (95% CI)	Recent IPV ^b (<i>n</i> = 59) AOR (95% CI)
Access/affordability		
Not a barrier	-Ref-	-Ref-
Barrier	1.05 (0.50, 2.22)	0.57 (0.12, 2.82)
Stigma		
Not a barrier	-Ref-	-Ref-
Barrier	0.90 (0.42, 1.91)	1.12 (0.33, 3.82)
Partner reaction		
Not a barrier	-Ref-	-Ref-
Barrier	0.98 (0.46, 2.08)	1.17 (0.34, 4.02)
Drug effects ^c		
	–	–
Perceived benefits		
Not a barrier	-Ref-	-Ref-
Barrier	0.25 (0.11, 0.59)**	0.21 (0.04, 0.95)*
Risk compensation		
Not a barrier	-Ref-	-Ref-
Barrier	0.85 (0.40, 1.81)	0.51 (0.14, 1.78)
Lack of perceived need		
Not a barrier	-Ref-	-Ref-
Barrier	0.11 (0.05, 0.27)***	0.06 (0.01, 0.30)***
Mistrust		
Not a barrier	-Ref-	-Ref-
Barrier	0.60 (0.27, 1.32)	0.22 (0.06, 0.89)*
Adherence ^c		
Not a barrier	-Ref-	–
Barrier	0.37 (0.16, 0.88)*	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

^aModels were run for each barrier individually, and all were adjusted for age, race, ethnicity, sexual orientation, and education completed

^bSeparate regression models were generated for participants who reported recent IPV, controlling for age, race, ethnicity, sexual orientation, and education

^cVariable was not included in model due to little variation in data

research, which highlights that a lack of interest or openness to PrEP among women has involved similar factors including low risk perception, medicine concerns (e.g., high pill burden, side effects), cost, mistrust of medical institutions or pharmaceutical companies, newness of drug, stigma, and lack of communication among community members and healthcare providers [8, 9, 29, 35]. This study also found partner reaction as an important barrier to potential PrEP use among all women and accusations of cheating, mistrust by partners, and fear of partner finding out about PrEP use were specifically described in open-ended questions as factors impacting women's willingness to use PrEP. Focus groups in Washington, D.C. also report that a concern of hostile reactions or suspicions towards those who take PrEP and allegations of infidelity and mistrust by partners were described by women [29]. Further, Willie et al.'s [36] qualitative interviews with 19 women living in Connecticut who reported

physical and/or sexual IPV in the past six months found that male partners' reactions (including hypothetical reaction) influenced women's interest and intention to use PrEP and recommend the need for health care communication around women's risk reduction strategies to include relational barriers to PrEP engagement. While partner reaction was not originally included in the scale of PrEP attitudes, study findings, together with existing research, underscore that partner reaction is an important area in understanding women's PrEP acceptability and decision-making.

Considerably high prevalence of IPV were disclosed among this sample with 41% of women reporting recent experience of physical, sexual, or psychological violence by an intimate partner. The IPV prevalence in this sample are slightly higher than those reported in existing prevalence research in the region. For example, Decker et al. [15] found lower prevalence among a similar population of

women seeking care at 24 free-standing Title X family planning clinics in Western Pennsylvania with past three-month physical or sexual IPV reported among 11% of the participants ($N=3504$). Recent IPV experience was significantly associated with barriers of access/affordability, stigma, partner reaction, and adherence in bivariate analyses. Descriptions of a lack of consistent healthcare, a high pill burden, the follow-up required, and accusations of cheating from the qualitative open-ended questions provide important insight into specific barriers perceived to impact PrEP use among women with recent IPV. Further, abusive and controlling behaviors of partners were frequently described, both by women reporting recent IPV and those not disclosing recent IPV, as factors impacting women's willingness to use PrEP.

Mistrust of drug companies and healthcare providers emerged as a barrier to PrEP use among women who reported recent IPV in multivariable logistic regression analyses and is consistent with existing research [8, 9, 29, 35]. Research findings from in-depth interviews with 26 women disclosing IPV within the past six months in the United States found that women's concerns of long-term health outcomes combined with medical mistrust resulted in disinterest in using PrEP, leading the authors to recommend that medical mistrust be openly discussed among women when assessing PrEP acceptability [28]. Lack of perceived need was also significantly associated with willingness to use PrEP among women who reported recent IPV in multivariable regression analyses. Garfinkel et al. [23] suggest that women may not connect IPV experiences with increased HIV risk after finding that among women seeking care at a family planning clinic, PrEP acceptability was significantly lower among women with a history of IPV relative to women without an abuse history (57% vs. 62%, AOR 0.71; 95% CI 0.59–0.85, $p < 0.001$).

Future PrEP intervention development may need clear information and discussions around such things as medical and pharmaceutical mistrust, women's HIV risk perceptions, as well as perceived issues of short and long-term side effects. Further research is also needed to fully understand the considerations necessary for engaging women in PrEP discussions and implementing PrEP care that prioritizes women's safety. Questions remain around what messaging is appropriate to help women understand and explain their need for PrEP, where and by whom should PrEP be discussed and distributed, potential uptake considerations including the importance of unmarked packaging and medical and health insurance records, and suggested services to support adherence and retention in care (e.g., safety planning, covert use, burden of follow-up visits required). Our finding that concerns related to the frequent medical follow-ups is a barrier to PrEP use is supported by existing work [11], which also identified that safety planning with women regarding PrEP use may need to take place.

While PrEP offers several advantages over other existing HIV prevention strategies (e.g., autonomous or covert use and not needing to be taken at time of sexual activity), and has the potential to expand prevention options for women in abusive and controlling relationships, IPV experiences and fears associated with partner may impact women's PrEP decision-making and use. Over half of women reporting recent IPV in this study reported issues around partner reaction impacting potential PrEP use. These study findings contribute to the growing discussion of potential implications of abusive partners on women's willingness to use PrEP. Other research suggests that women who have experienced IPV may be concerned about their partner interfering with their PrEP use [26, 28]. Braksmajer et al.'s interviews [28] among women in violent intimate relationships in the United States found that a third of participants described potential partner interference as a barrier to PrEP use, that most women would not use PrEP covertly, and that many feared increased violence if their partner were to discover covert PrEP use. Another study found that past-year sexual IPV and lifetime psychological IPV were associated with believing a partner would prevent your PrEP use among women and men in the United States [26]. Additional research is needed to further understand the considerations necessary for engaging women in PrEP discussions and implementing PrEP care that prioritizes women's safety.

This study has limitations worth noting. The relatively small sample size limited our ability to identify statistically significant differences between groups, including comparisons between women based on abuse experiences. The fairly homogenous sample of women included may have also limited the study. Future research should examine whether IPV and barriers to PrEP acceptability vary between women with different sociodemographic backgrounds (e.g., age, race, income) or geographic setting (e.g., non-urban clinics). A potential for underreporting of sensitive and stigmatized behaviors such as experience of violence may also be present. However, the high prevalence of IPV reported suggest that this was likely not an issue and the approach used is consistent with guidelines for assessing IPV [30, 37]. Also, most participants had not heard of PrEP prior to study participation and were then asked to offer their attitudes towards their potential PrEP use. Attitudes towards PrEP use may have varied if participants were more familiar with PrEP or were given additional time to consider it. The inclusion of open-ended survey questions provided context of factors impacting women's PrEP use; however, it was not possible to probe or ask follow-up questions to elicit additional information. Future research should include qualitative methods to more fully examine perceived barriers to women's PrEP use. Finally, this study included a convenience sample and findings may not necessarily be generalizable to all

women. While family planning clinics provide an appropriate setting for discussing sexual behavior and HIV prevention, results might not be reflective of all women who may benefit from PrEP but are not engaged in care at family planning clinics.

Findings from this mixed methods study provides valuable insights into PrEP acceptability among women in general, and specifically, among those in abusive and controlling relationships. While a high percentage of women were willing to use PrEP, a number of potential barriers were identified. The limited awareness of PrEP and misconceptions around PrEP (e.g., effectiveness, side effects, who is able to use) support the need to increase PrEP awareness and understanding among all women, including women with IPV experience. Study findings also suggest that clear information and discussions about pharmaceutical and healthcare provider mistrust, HIV risk perception, concerns and fears around intimate partner reaction, as well as issues of perceived short and long-term PrEP side effects are important for women's willingness to use PrEP. While our study findings contribute to an enhanced understanding of the importance of increased awareness raising and PrEP understanding for women and the importance of IPV and relationship dynamics in PrEP decision-making, additional research is needed to support development of a woman-centered PrEP intervention that reflects the context of IPV [28, 38]. The value of family planning clinics as a comfortable setting for discussing sexual behavior, IPV, and HIV prevention [20, 23], underscores the need for additional research to explore such a setting for implementation of trauma-informed HIV prevention and PrEP care among women. Specific attention to intervention development research around key questions of advertisement, access, uptake, and adherence is necessary to focus development of a woman-centered PrEP intervention that reflects the context of IPV.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in this study involving human participants were in accordance with the ethical standards of the University of Pittsburgh Institutional Review Board.

Informed Consent Informed consent was obtained from all individual participants included in the study.

References

- Centers for Disease Control and Prevention. Preexposure prophylaxis (PrEP) for HIV prevention 2014. https://www.cdc.gov/hiv/pdf/PrEP_fact_sheet_final.pdf.
- Food and Drug Administration. Truvada for PrEP fact sheet: ensuring safe and proper use 2012. <https://www.fda.gov/downloads/NewsEvents/Newsroom/FactSheets/UCM312279.pdf>.
- Fonner VA, Dalglisch SL, Kennedy CE, Baggaley R, O'Reilly KR, Koechlin FM, et al. Effectiveness and safety of oral HIV preexposure prophylaxis for all populations. *Aids*. 2016;30(12):1973–83.
- Koechlin FM, Fonner VA, Dalglisch SL, O'Reilly KR, Baggaley R, Grant RM, et al. Values and preferences on the use of oral pre-exposure prophylaxis (PrEP) for HIV prevention among multiple populations: a systematic review of the literature. *AIDS Behav*. 2017;21(5):1325–35.
- Chen NE, Meyer JP, Springer SA. Advances in the prevention of heterosexual transmission of HIV/AIDS among women in the United States. *Infect Dis Rep*. 2011;3(1):e6.
- Rubtsova A, Wingood GM, Dunkle K, Camp C, DiClemente RJ. Young adult women and correlates of potential adoption of pre-exposure prophylaxis (PrEP): results of a national survey. *Curr HIV Res*. 2013;11(7):543–8.
- AIDSVu. National Women and Girls HIV/AIDS Awareness Day 2018 2018. <https://aidsvu.org/resources/nwghaad2018/>.
- Auerbach JD, Kinsky S, Brown G, Charles V. Knowledge, attitudes, and likelihood of pre-exposure prophylaxis (PrEP) use among US women at risk of acquiring HIV. *AIDS Patient Care STDS*. 2015;29(2):102–10.
- Flash CA, Stone VE, Mitty JA, Mimiaga MJ, Hall KT, Krakower D, et al. Perspectives on HIV prevention among urban black women: a potential role for HIV pre-exposure prophylaxis. *AIDS Patient Care STDS*. 2014;28(12):635–42.
- Wingood GM, Dunkle K, Camp C, Patel S, Painter JE, Rubtsova A, et al. Racial differences and correlates of potential adoption of preexposure prophylaxis: results of a national survey. *J Acquir Immune Defic Syndr*. 2013;63(Suppl 1):S95–101.
- Collier KL, Colarossi LG, Sanders K. Raising Awareness of Pre-Exposure Prophylaxis (PrEP) among Women in New York City: community and provider perspectives. *J Health Commun*. 2017;22(3):183–9.
- Braksmajer A, Senn TE, McMahon J. The potential of pre-exposure prophylaxis for women in violent relationships. *AIDS Patient Care STDS*. 2016;30(6):274–81.
- Weeks MR, Mosack KE, Abbott M, Sylla LN, Valdes B, Prince M. Microbicide acceptability among high-risk urban US women: experiences and perceptions of sexually transmitted HIV prevention. *Sex Transm Dis*. 2004;31(11):682–90.
- Bergmann JN, Stockman JK. How does intimate partner violence affect condom and oral contraceptive Use in the United States? A systematic review of the literature. *Contraception*. 2015;91(6):438–55.
- Decker MR, Miller E, McCauley HL, Tancredi DJ, Anderson H, Levenson RR, et al. Recent partner violence and sexual and drug-related STI/HIV risk among adolescent and young adult women attending family planning clinics. *Sex Transm Infect*. 2014;90(2):145–9.
- Stockman JK, Syvertsen JL, Robertson AM, Ludwig-Barron NT, Bergmann JN, Palinkas LA. Women's perspectives on female-initiated barrier methods for the prevention of HIV in the context of methamphetamine use and partner violence. *Womens Health Issues*. 2014;24(4):e397–405.
- Wingood GM, DiClemente RJ. The effects of an abusive primary partner on the condom use and sexual negotiation

- practices of African-American women. *Am J Public Health.* 1997;87(6):1016–8.
18. Roberts ST, Haberer J, Celum C, Mugo N, Ware NC, Cohen CR, et al. Intimate partner violence and adherence to HIV Pre-exposure Prophylaxis (PrEP) in African women in HIV serodiscordant relationships: a prospective cohort study. *J Acquir Immune Defic Syndr.* 2016;73(3):313–22.
 19. Willie T, Kershaw T, Campbell JC, Alexander KA. Intimate partner violence and PrEP acceptability among low-income, young black women: exploring the mediating role of reproductive coercion. *AIDS Behav.* 2017;21(8):2261–9.
 20. Hoover K, editor Women and PrEP Implementation. US Women & PrEP Working Group; 2014 June 30, 2014.
 21. Frost JJ. US women's use of sexual and reproductive health services: trends, sources of care and factors associated with use, 1995–2010. New York: Guttmacher Institute; 2013.
 22. Frost JJ, Gold RB, Bucek A. Specialized family planning clinics in the United States: why women choose them and their role in meeting women's health care needs. *Womens Health Issues.* 2012;22(6):e519–e525525.
 23. Garfinkel DB, Alexander KA, McDonald-Mosley R, Willie TC, Decker MR. Predictors of HIV-related risk perception and PrEP acceptability among young adult female family planning patients. *AIDS Care.* 2017;29(6):751–8.
 24. Qualtrics. Provo, Utah, USA. 2005.
 25. Eisingerich AB, Wheelock A, Gomez GB, Garnett GP, Dybul MR, Piot PK. Attitudes and acceptance of oral and parenteral HIV preexposure prophylaxis among potential user groups: a multinational study. *PLoS ONE.* 2012;7(1):e28238.
 26. Willie TC, Stockman JK, Overstreet NM, Kershaw TS. Examining the impact of intimate partner violence type and timing on pre-exposure prophylaxis awareness, interest, and coercion. *AIDS Behav.* 2018;22(4):1190–200.
 27. Holloway IW, Tan D, Gildner JL, Beougher SC, Pulsipher C, Montoya JA, et al. Facilitators and barriers to pre-exposure prophylaxis willingness among young men who have sex with men who use geosocial networking applications in California. *AIDS Patient Care STDS.* 2017;31(12):517–27.
 28. Braksmajer A, Leblanc NM, El-Bassel N, Urban MA, McMahon JM. Feasibility and acceptability of pre-exposure prophylaxis use among women in violent relationships. *AIDS Care.* 2019;31(4):475–80.
 29. Goparaju L, Praschan NC, Warren-Jeanpiere L, Experton LS, Young MA, Kassaye S. Stigma, partners, providers and costs: potential barriers to PrEP uptake among US women. *J AIDS Clin Res.* 2017;8(9):730.
 30. Straus MA, Douglas EM. A short form of the revised conflict tactics scales, and typologies for severity and mutuality. *Violence Victims.* 2004;19(5):507–20.
 31. Fonner VA, Kennedy CE, O'Reilly KR, Sweat MD. Systematic assessment of condom use measurement in evaluation of HIV prevention interventions: need for standardization of measures. *AIDS Behav.* 2014;18(12):2374–86.
 32. Centers for Disease Control and Prevention/US Public Health Service. Preexposure prophylaxis for the prevention of HIV infection in the United States—2017 Update: a clinical practice guideline.; 2018 x.
 33. QSR International. Nvivo 12 Mac. 2018.
 34. Willie TC, Stockman JK, Keene DE, Calabrese SK, Alexander KA, Kershaw TS. Social networks and its impact on women's awareness, interest, and uptake of HIV pre-exposure prophylaxis (PrEP): implications for women experiencing intimate partner violence. *J Acquir Immune Defic Syndr.* 2018;80(4):386–93.
 35. Kwakwa HA, Bessias S, Sturgis D, Mvula N, Wahome R, Coyle C, et al. Attitudes toward HIV pre-exposure prophylaxis in a United States urban clinic population. *AIDS Behav.* 2016;20(7):1443–500.
 36. Willie TC, Keene DE, Kershaw TS, Stockman JK. “You Never Know What Could Happen”: women's perspectives of pre-exposure prophylaxis in the context of recent intimate partner violence. *Women's Health Issues.* 2020;30(1):41–8.
 37. World Health Organization. Putting women first: ethical and safety recommendations for research on domestic violence against women. Geneva: World Health Organization; 2001.
 38. Aaron E, Blum C, Seidman D, Hoyt MJ, Simone J, Sullivan M, et al. Optimizing delivery of HIV preexposure prophylaxis for women in the United States. *AIDS Patient Care STDS.* 2018;32(1):16–23.

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