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Predictors of HIV-related risk perception and PrEP acceptability among young adult female family planning patients

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Abstract

HIV pre-exposure prophylaxis (PrEP) presents new opportunities for HIV prevention. While women comprise approximately 20% of new HIV infections in the US, significant questions remain about how to most effectively facilitate PrEP uptake for this population. Family planning clinics are a dominant source of health care for young women and support an estimated 4.5 million women annually. We explore characteristics associated with HIV risk perception and PrEP acceptability among young adult women seeking reproductive health services in a high-prevalence setting. A cross-sectional, clinic-based survey was conducted with women ages 18–35 (n=146) seeking health care at two family planning clinics in the greater Baltimore, Maryland area, from January to April, 2014. An estimated 22% of women reported being worried about HIV risk, and 60% reported they would consider taking a pill daily to prevent HIV. In adjusted models, HIV-related worry was associated with having no college education, being single or dating more than one person, practicing consistent condom use during vaginal sex, and having ever traded sex. PrEP acceptability was significantly associated with being Black (71% vs. 49%, AOR 2.23, CI: 1.89–2.64) and having ever traded sex (83% vs. 58%, AOR 4.94, CI: 2.00–12.22). For women with a history of intimate partner violence (IPV), PrEP acceptability was significantly *lower* (57% vs. 62%, AOR .71, CI: .59–.85) relative to their non-abused counterparts. Results suggest that family planning clinics may be a natural setting for PrEP discussion and roll-out. They should be considered in the context of integrating HIV prevention with reproductive health services. Women with a trauma history may need additional support for implementing HIV prevention in the form of PrEP.

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Introduction

HIV/AIDS is the leading cause of death for women of reproductive age (15 – 44) (WHO, 2013). Heterosexual transmission is the main infection pathway for women, comprising 84% of new infections among U.S. women in 2010 (CDC, 2015a). Understanding HIV risk perception among at-risk populations of women, including patients of clinic and community-based health services, is key for both behavioural and biomedical prevention. The emergence of HIV pre-exposure prophylaxis (PrEP) presents new opportunities for prevention (McMahon, Myers, & Kurth, et al., 2014; Cáceres, Koechlin, & Goicochea, et al., 2015; Gomez, Borquez, & Case, et al., 2013). When taken daily, oral PrEP has been shown to reduce the risk of HIV by 62% in sexually active heterosexual adults (Thigpen, Kebaabetswe, & Paxton, et al. 2012). Multiple international studies have demonstrated PrEP acceptability among at-risk women including sex workers.(Guest, 2010; Eisingerich, Wheelock, & Gomez, et al, 2012; Mutua Sanders, & Mugo, et al., 2012; Peng, Yang, & Zhang, et al., 2012; Zhao, Sun, & Xue, et al. 2011). While qualitative evidence indicates some acceptability among urban women at risk for infection in the US (Flash, Stone & Mitty, et al., 2014; Auerbach, Kinsky, & Brown, et al, 2015), relatively little quantitative data has emerged on acceptability among women, particularly with respect to HIV risk perception (Rubstova, Wingood, & Dunkle, et al., 2013), and many questions remain regarding PrEP delivery and implementation for women.

Women's HIV risk perceptions are key for successful PrEP delivery, risk-reduction counselling, and understanding needs for knowledge and behavioural prevention strategies. Women's HIV risk is shaped by both structural and behavioural risk factors, including intimate partner violence (IPV), sexual coercion, trading sex, and having multiple sexual partners; significant racial disparities render Black women at heightened risk of infection (Andersson, Crockroft, & Shea, 2008; Baral, Beyrer, & Muessig, et al., 2012; CDC, 2013a; CDC, 2014a; CDC, 2014b; El-Bassel, Gilbert, & Wu, et al., 2007; Miles, Le, & Wejnert, et al., 2013; Stockman, Campbell, & Celentano, et al., 2013). Yet some research on risk perception has generated counter-intuitive results. For example, multiple studies demonstrate low HIV risk perception among sex workers (Malta, Monteiro, & Lima, et al., 2008; Thakor, Kosambiya, & Desal, 2010; Ankomah, et al., 2011) and among women who have experienced IPV (Witte & Kendra, 2010; Corneli, McKenna, & Headley, et al., 2014). In a predominantly Black study population, Khawcharoenporn et al. found that high-risk participants had no or low risk perception and demonstrated inconsistent condom use, despite knowledge of STI risks. Clarifying drivers of risk perception among high-risk women is critical in recognizing and responding to potential deficits, and in conveying knowledge and optimizing behavioural and biomedical prevention, including PrEP.

The needs are biggest in the urban centers most affected by HIV. The greater Baltimore, MD area consistently ranks in the top 10 U.S. cities for the annual number of new HIV diagnoses

(CDC, 2010; CDC, 2013b; CDC, 2014c). Nationally, the racial disparities in HIV are significant, with an infection rate for Black women roughly 20 times that of white women. This disparity is further concentrated in Baltimore, where the infection rate among Black women was found to be five times that of the CDC's national estimate for Black women (Hodder, Justman, & Hughes, et al., 2012). In Baltimore, heterosexual transmission accounts for almost 40% of new HIV diagnoses compared with just 25% of heterosexually transmitted cases nationally (DHMH, 2015; CDC, 2013b). In 2012, women comprised over one in four (26.9%) new cases in the state, up from 14.9% in 1985 (DHMH, 2014). The epidemiological landscape of HIV in Baltimore highlights the vast unmet health needs among women and the opportunity for PrEP in this high-prevalence setting. It also points to Baltimore as a highly relevant setting for PrEP implementation research (CDC, 2014e).

The Title X family planning clinics that provide services for over 4.5 million women annually are a critical setting for understanding women's HIV risk perception and PrEP acceptability, as their patient population is at significant risk for infection (DHHS, 2015a). While these clinics focus on family planning, they provided STI screening to over 2.2 million women in 2011 and HIV testing for over 1.3 million patients, indicative of their dual role in reproductive and sexual health (DHHS, 2015a). Qualitative research indicates women's comfort in discussing sexual risk behavior with family planning providers (Auerbach et al., 2015). The integration of HIV prevention and care with reproductive health services for women is prioritized in national strategic plans for sexual reproductive health and HIV, including PEPFAR and the President's National HIV/AIDS Strategy (DHHS, 2015b; PEPFAR, 2009; The White House, 2015). With the emergence of PrEP and the need for effective implementation comes a renewed urgency in understanding HIV risk perception and PrEP acceptability in the reproductive health settings that women perceive as a natural conduit for discussion on sexual health (Auerbach et al., 2015).

To fill this gap, and to extend the currently limited evidence base on PrEP readiness and acceptability among high-risk women in the U.S, our study explores individual, behavioural, and structural factors associated with 1) HIV risk perception and 2) PrEP acceptability, among young adult female family planning patients. In doing so, it provides direction for PrEP implementation for high-risk heterosexual women, and explores the value of integrating this form of HIV prevention within family planning services for underserved women.

Methods

This study examines cross-sectional data that served as baseline for a prospective evaluation. Data were collected January – April, 2014, at two publicly-funded family planning clinics, one in Baltimore City (BC) and one in a northern suburb (NS). Eligible women who presented for care during times of data collection were recruited to participate in this survey prior to their clinical care. Participants were deemed eligible for the study if they were female, between the ages of 18 and 35, seeking services at one of the participating clinics, and were English speaking. Procedures generated a total of 146 participants (BC n = 75, NS n=71). Following informed consent, participants self-administered a brief (~15 minute) survey via Audio Computer Assisted Survey Instrument (ACASI); domains included

demographics, health care seeking patterns, sexual and reproductive health behaviour, violence experiences, and access to and engagement with local support services. Following completion, participants were offered a \$10 gift card and list of local resources for their participation. The Johns Hopkins and Maryland Department of Health and Mental Hygiene Institutional Review Boards approved all activities and procedures.

All data were self-reported. HIV-related risk perception was assessed with a single item, specifically “how worried are you about HIV in the next six months?”; with those who expressed either being somewhat or very worried about HIV risk classified as worried, compared with those who expressed no worry. PrEP acceptability was assessed via a single item, specifically, “would you consider taking a pill every day to prevent HIV in the next six months?” Additional items assessed lifetime history of partner violence, indicated by a ‘yes’ to at least one of three violence-related questions adapted from the revised Conflict Tactics Scale (Strauss, Hamby, Boney-McCoy, & Sugarman, 1996). Women who replied that they had sex without using a condom in the past three months when they wanted to use one were considered to have had recent coerced unprotected sex. Sex was defined to include vaginal or anal intercourse only. Consistent condom use during vaginal sex was defined by participants who reported always doing so, versus participants who reported ‘usually’, ‘sometimes,’ or ‘never’ using condoms (hereafter referenced as inconsistent use). Participants were classified as having traded sex if they reported ever having exchanged sex or sexual acts for money, drugs, shelter, gifts, or other resources. Additional items assessed demographics, sexual history, and sexual behaviour. Categorical variables were dichotomized for analysis.

Descriptive statistics were generated for sample demographic characteristics. Univariate analysis via the Wald Log-Linear X^2 tests are presented at a significance threshold of $p < .05$. These results, along with a stepwise model comparison procedure, identified eligible predictors for the multivariate analysis ($p < .05$). Subsequently, multivariate models were built to examine associations with HIV-related risk perception, and PrEP acceptability, respectively. Estimates for the association between the independent variables and HIV-related worry, as well as between the independent variables and PrEP acceptability, are reported for the full sample. Missing data was minimal, and was recoded to the mean response for condom use frequency (10%), and to the null or negative response for PrEP acceptability (<1%) and IPV history (2%); sensitivity analyses confirmed this approach. Analyses were conducted using STATA version 13 (Stata Corp., College Station, TX), and accommodated the clinic-clustered nature of the data.

Results

Demographics

The mean age of participants was 25.2 (range 18–35) in the overall sample (Table 1). The majority of participants in the sample were born in the United States, had some college experience or had completed college, were either married or in a serious relationship, and reported having sex with mostly or only men. Just over half of the sample identified as Black or African American (51.4%). The remaining sample comprised of participants who

identified as White, Hispanic/Latina, Asian, or Multiracial (48.6%). Fifteen percent of the sample reported having never been tested for HIV.

Risk Perception: Short-term HIV worry

Twenty-two percent of the sample reported worry about their short-term HIV risk. Roughly two-fifths of study participants had a lifetime history of IPV (38.4%) and just under a third had experienced coerced unprotected sex (29.5%) (Table 2). In the adjusted analysis, significant predictors of HIV-related worry included having no college education (28% vs. 19%, AOR 1.17, CI: 1.05–1.30), being single or dating multiple people (31 vs. 17%, AOR 1.96, CI: 1.85–2.07), reporting inconsistent (or no) condom use during vaginal sex (21% vs. 29%, AOR .47, CI: .23–.94), and having a lifetime history of trading sex (42% vs. 20%, AOR 3.0, CI: 1.16–7.78). Several additional factors were relevant bivariately but attenuated in the presence of other factors in the final model. Specifically, worry was greater among those who had experienced coerced unprotected sex compared with women who had not (37% versus 16%, OR 3.22, CI: 1.09–9.53); though this attenuated with the inclusion of trading sex.

Acceptability of PrEP

Over three-fifths of the sample (60.3%, 88/146) reported that they would consider taking a daily pill that protects against HIV (Table 3). In the adjusted model, Black women were more than twice as likely to consider taking PrEP as non-Black women (71% vs. 49%, AOR 2.23, CI: 1.89–2.64). Women who had ever traded sex were almost five times as likely to consider taking PrEP (83% vs. 58%, AOR 4.94, CI: 2.00–12.22). In addition, women with a lifetime history of IPV were significantly less likely to consider taking PrEP than those without a history of IPV (57% vs. 62%, AOR .71, CI: .59–.85). While PrEP acceptability was bivariately higher among women who were single or dating more than one person (69% versus 56%, OR 1.73, CI: 1.04–2.88) and those reporting inconsistent condom use (59% vs. 67%, OR .73, CI: .53–.99), these patterns attenuated in the multivariate model into non-significance. Short term HIV worry was not found to be associated with PrEP acceptability.

Discussion

This is the first study to explore HIV risk perception and PrEP acceptability among female family planning patients. More than one in five women (22%) expressed short-term worry about HIV. PrEP acceptability was high with a majority of women (60%), indicating they would consider taking an HIV prevention pill daily. Findings suggest the value of PrEP as a component of HIV prevention for the millions of U.S. women who seek clinical sexual and reproductive health care at family planning programs, particularly in settings of high HIV burden. Implementation considerations should be further shaped though feasibility assessment of PrEP delivery services in the family planning setting, inclusive of: confirmation of risk for HIV acquisition among patients, clinician and staff training, expansion of referral networks, bolstering services to monitor for incident infection and renal function, and cost and supply-chain considerations. Increased awareness is also key for supporting PrEP delivery in clinical settings (CDC, 2014e; CDC, 2015c).

One concerning finding in our study is that women with an IPV history demonstrated significantly *less* acceptability of PrEP as compared with their non-abused counterparts. Past evidence linking violence with HIV risk behavior and infection (Li Marshall, & Rees, et al. 2014) indicates abused women as a high priority population for HIV prevention, and addressing violence and trauma to improve HIV outcomes for women as a national priority (The White House, 2013; The White House, 2015). The lack of acceptability observed among women with an IPV history may reflect competing priorities, concerns about adherence, or potential fears about partner interference in or disapproval of her medication, as has been suggested (McClosky, Williams & Lichter, et al., 2007; Miller & Silverman, 2010). Our results contrast with recent findings from a national phone-based survey documenting higher PrEP acceptability among women with an IPV history (Rubstova, Wingood, & Dunkle, et al., 2013). Their findings, which appear to support the Health Belief Model, suggest that participants with a history of IPV have a higher HIV-risk perception and are therefore more likely to consider practicing preventive behaviors. In our clinic-based sample however, we identified no associations between lifetime history of IPV and HIV risk perception. This is consistent with past evidence that women may not connect abusive experiences with increased HIV risk and underestimate the need for prevention (Cole, Logan, & Shannon, 2008). Taken together, current findings suggest that women with a trauma history may require additional support, including trauma-informed care, to ensure appropriate and successful PrEP uptake and adherence (The White House, 2013).

Current findings provide what we believe is the first evidence of heightened HIV risk perception, and high acceptability of PrEP, among US women with a history of trading sex. Commercial sex is among the PrEP indicators enumerated in the 2014 CDC PrEP Guidelines (CDC, 2014d), reflecting the high prevalence of HIV among sex traders in the US (Miles, Le, & Wejnert, et al., 2013; Decker, Beyrer, & Sherman, 2014) and globally (Baral, Beyrer, & Muessig, et al., 2012). Current findings of greater HIV risk perception and PrEP acceptability among women who trade sex indicate the potential value and feasibility of PrEP roll-out to this population, whose HIV risk is shaped by a confluence of social, structural and behavioural factors. Findings confirm past research demonstrating that family planning clinic patient populations include women with recent and past sex trade histories (Decker, 2012), and suggest the potential value of this clinic setting in reaching women who trade sex.

Black women in our study were significantly more likely than women of other races to express PrEP acceptability, despite no evidence of difference in their HIV risk perception. The intensity of the HIV epidemic for Black women, particularly in Baltimore, is likely responsible (CDC, 2015b; Hodder, Justman, & Hughes, et al., 2012). Current evidence that over 70% of Black women would consider using PrEP suggests significant potential for implementation in this high-prevalence setting. Concerns that emerged from qualitative research with a predominantly Black sample of women included distrust of the medical system, concerns about insurance coverage, stigma, and the potential for sexual partners to misinterpret participants' use of PrEP as an indication that they are HIV positive (Auerbach, Kinsky, & Brown, et al. 2015); these issues must be addressed in implementation.

Additional determinants of increased HIV risk perception included not having completed college, and being single or dating multiple partners, perhaps reflective of perceived risk within their sexual networks. Sexual risk behaviour in the form of inconsistent condom use was inversely associated with risk perception, though we note that the relationships between consistent condom use behaviour and HIV risk perception is likely mutually reinforcing. In considering clinical implications of these findings, it is important for health care providers to be aware of potential ‘incongruence’ between perception and behaviour. For example, if providers rely on patient’s self-perceived risk without assessing behaviour directly, they may miss opportunities to provide appropriate testing or counselling (Pringle, Merchant, & Clark, 2013). While results indicate strong interest in PrEP, further programmatic and implementation research is needed to understand women’s ability to successfully adhere to PrEP, and optimize the role of family planning clinics in this process. In addition, providers should be aware of the potential disconnect between patient’s understanding of HIV-risk and their capacity to follow-through on prevention behaviours, such as adhering to PrEP long-term. Efforts to promote PrEP will likely require a series of complimentary interventions, including tailored communications activities that provide accurate information from trustworthy sources so that they are well-received by high-risk populations.

Limitations

Findings should be interpreted in light of several limitations. Our relatively small sample limited statistical power to detect smaller differences. All data were self-reported, and we were unable to ascertain HIV status and restrict analyses to those at risk for infection. HIV status may have influenced responses. While the clinic-based nature of our sample is well-suited to understand the perceptions and PrEP considerations of this important patient population, findings may not necessarily generalize to women of reproductive age in the underlying community. We did not obtain data on PrEP-related concerns and considerations including cost and potential side effects (Flash, Stone & Mitty, et al. 2014; Smith, Toledo & Smith, et al., 2012; Auerbach et al., 2015). Importantly, we did not assess accuracy of PrEP knowledge, which may affect perceived acceptability. We note that our measure of HIV-related worry was not associated with PrEP acceptability, suggesting complexities in understanding women’s consideration of PrEP relative to their self-reported risk perception. It is also possible that nuances of participants’ HIV-related risk perception were missed with our single-item assessment.

Conclusion

Our study identified high acceptability of PrEP among urban women attending family planning clinics in the high HIV prevalence setting of Baltimore, MD. Acceptability was highest among Black women and women with a sex trade history. Family planning clinics are very valuable for identifying the high-risk heterosexual women who stand to benefit most from PrEP. The present study extends a critical evidence base on PrEP acceptability for women and integration of HIV prevention in the family planning clinics that reach more than 4 million US women annually (Guttmacher, 2015).

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Table 1

Sample Characteristics (n=146 female family planning patients)

	Total (n=146) %(n)
<i>Total</i>	100 (146)
Mean age (mean, (range))	25.2 (18–35)
Nativity	
Born in the U.S.	93.2 (136)
Born outside the U.S.	6.8 (10)
Education	
< 12 th Grade	7.5 (11)
High school graduate	24.7 (36)
Some college	34.9 (48)
Finished College or Graduate School	32.9 (48)
Race	
Black	51.4 (75)
White	38.4 (56)
Other (Asian, Hispanic/Latina, Multiracial)	10.3 (15)
Relationship status	
Single or dating >1 person	35.0 (51)
Dating one person/in a serious relationship	56.2 (82)
Married	8.9 (13)
Has sex with:	
Any or same sex	16.4 (24)
Men only	83.6 (122)
Ever tested for HIV	
No, never	14.5 (21)
Yes, in the past 3 months	36.6 (53)
Yes, but not in the past 3 months	49.0 (71)

Table 2

Prevalence of HIV-related worry and associations with demographics, sexual behavior, and violence/coercion

<i>Model Predictors</i>	Sample % Worried about HIV risk		Bivariate	Final Full Model
	% (n)	% (n)	OR (95% CI)	AOR (95% CI)
Mean age	25.2	24.5		
Total % (n)		21.9 (32/146)		
Education				
Some or completed College	67.8 (99)	19.2 (19)	-ref-	-ref-
No college	37.2 (47)	27.7 (13)	1.61 *** (1.42, 1.83)	1.17 ** (1.05, 1.30)
Race				
Overall				
Non-black	48.6 (71)	15.5 (11)	-ref-	-ref-
Black	51.4 (75)	28.0 (21)	2.12 (.35, 12.78)	1.51 (.25, 9.07)
Relationship Status				
Overall				
Married or in a serious relationship	65.1 (95)	16.84 (16)	-ref-	-ref-
Single or Dating >1 person	34.9 (51)	31.37 (16)	2.26 *** (1.66, 3.06)	1.96 *** (1.85, 2.07)
Intimate Partner Violence				
Lifetime history of IPV				
No	61.6 (90)	20.0 (18)	-ref-	
Yes	38.4 (56)	25.0 (14)	1.33 (.77, 2.32)	
Had coerced unprotected sex in past 3 months				
No	70.6 (103)	15.5 (16)	-ref-	-ref-
Yes	29.5 (43)	37.2 (16)	3.22 * (1.09, 9.53)	2.90 (.66, 12.66)
Sexual History/Behaviors				
Condom use during vaginal sex				
Always	14.4 (21)	28.6 (6)	-ref-	-ref-
Inconsistent	85.6 (125)	20.8 (26)	.656 *** (.58, .75)	.47 * (.23, .94)
Ever traded sex				
No	91.8 (134)	20.2 (27)	-ref-	-ref-
Yes	8.2 (12)	41.7 (5)	2.83 *** (1.71, 4.68)	3.01 * (1.16, 7.78)

Note:

*
p < .05;**
p < .01;

p < .001.

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Table 3

Prevalence of PrEP acceptability and associations with demographics, sexual behavior, and violence/coercion among female family planning patients (n=146)

<i>Model Predictors</i>	Would consider taking a pill to prevent HIV in the next 6 months		Bivariate OR (95% CI)	Final Full Model AOR (95% CI)
	Sample % % (n)	% (n)		
Mean age	25.2	24.5		
Total % (n)		60.3 (88/146)		
Education				
Some or completed College	67.8 (99)	55.6 (55)	-ref-	
No college	37.2 (47)	70.2 (33)	1.89 (.41, 8.63)	
Age				
>26	45.9 (67)	52.2 (35)	-ref-	
<=25	54.1 (79)	67.1 (53)	1.86 (.58, 5.95)	
Race				
Overall				
Non-black	48.6 (71)	49.3 (35)	-ref-	-ref-
Black	51.4 (75)	70.7 (53)	2.48 ^{***} (2.35, 2.62)	2.23 ^{***} (1.89, 2.64)
Relationship Status				
Overall				
Married or in a serious relationship	65.1 (95)	55.8 (53)	-ref-	-ref-
Single or Dating >1 person	34.9 (51)	68.6 (35)	1.73 [*] (1.04, 2.88)	1.67 (.62, 4.51)
Intimate Partner Violence				
Lifetime history of IPV				
No	61.6 (90)	62.22 (56)	-ref-	-ref-
Yes	38.4 (56)	57.14 (32)	.81 ^{**} (.70, .94)	.71 ^{***} (.59, .85)
Had coerced unprotected sex in past 3 months				
No	69.9 (102)	57.3 (59)	-ref-	
Yes	29.5 (43)	67.4 (29)	1.55 (.80, 3.00)	
Sexual History/Behaviors				
Condom use during vaginal sex				
Always	14.4 (21)	66.7 (14)	-ref-	-ref-
Inconsistent	85.6 (125)	59.2 (74)	.73 [*] (.53, .99)	.70 (.47, 1.04)

<i>Model Predictors</i>	Would consider taking a pill to prevent HIV in the next 6 months		Bivariate OR (95% CI)	Final Full Model AOR (95% CI)
	Sample % % (n)	% (n)		
Ever traded sex				
No	91.8 (134)	58.2 (78)	-ref-	-ref-
Yes	8.2 (12)	83.3 (10)	3.59* (1.05, 12.23)	4.94*** (2.00, 12.22)
Worried about HIV risk in the next 6 months?				
Not worried at all	78.1 (114)	56.1 (64)	-ref-	
Worried a little or very worried	21.9 (32)	75.0 (24)	2.34 (.72, 7.66)	

Note:

*
p < .05;

**
p < .01;

p < .001.