Evaluating HIV Risk Factors and Willingness to Use Prep among African American Collegiate Women

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Abstract

African American women, especially those residing in the Southern United States (U.S.), are impacted by multiple socioeconomic, behavioral, physical, and personal factors increasing their risk of contracting HIV. Pre-exposure prophylaxis (PrEP) is a novel, effective, individual-controlled pharmacological approach to prevent HIV. Although some African American women have expressed a desire to use PrEP, this method has been underutilized in this population. There is a lack of research examining factors that affect African American women's willingness to use PrEP. The present study evaluated factors to predict African American collegiate women's willingness to initiate PrEP. Results indicated that marital status, history of trauma, and intimate and partner violence were significant predictors of PrEP acceptability for African American collegiate women. Most participants did not know about PrEP and reported a willingness to use PrEP, especially if they thought they were at high risk or had a HIV-positive partner. Participants with a history of intimate partner violence were at higher risk for HIV and expressed more willingness to use PrEP. When optimizing PrEP implementation for women at risk for HIV, it is important to incorporate trauma-informed care, safety planning, and psychological interventions within HIV prevention initiatives.

Keywords: *PrEP, College, HIV Risk, African American Women, College women.*

Introduction

According to the United States (U.S.) Census Bureau (2011), Black or African Americans represented 12% of the U.S. population, but accounted for 45% of all Human Immunodeficiency Virus (HIV) diagnoses in 2015 (Centers for Disease Control and Prevention [CDC], 2015). Of the 7,402 women infected with HIV in 2015, more than 61% were African American women with heterosexual contact being the most common form of transmission (CDC, 2015). Women 18-44 years old contract the brunt of new HIV infection (CDC, 2015) suggesting that both young and mid-age women are at high risk for HIV. Although HIV transmission among African American women has declined in the recent years, their rate of infection is the highest compared to women of all other races and ethnicities (CDC, 2015). Accordingly, the estimated lifetime HIV risk of African American women is 1 in 48 compared to 1 in 880 for White women (CDC, 2016a).
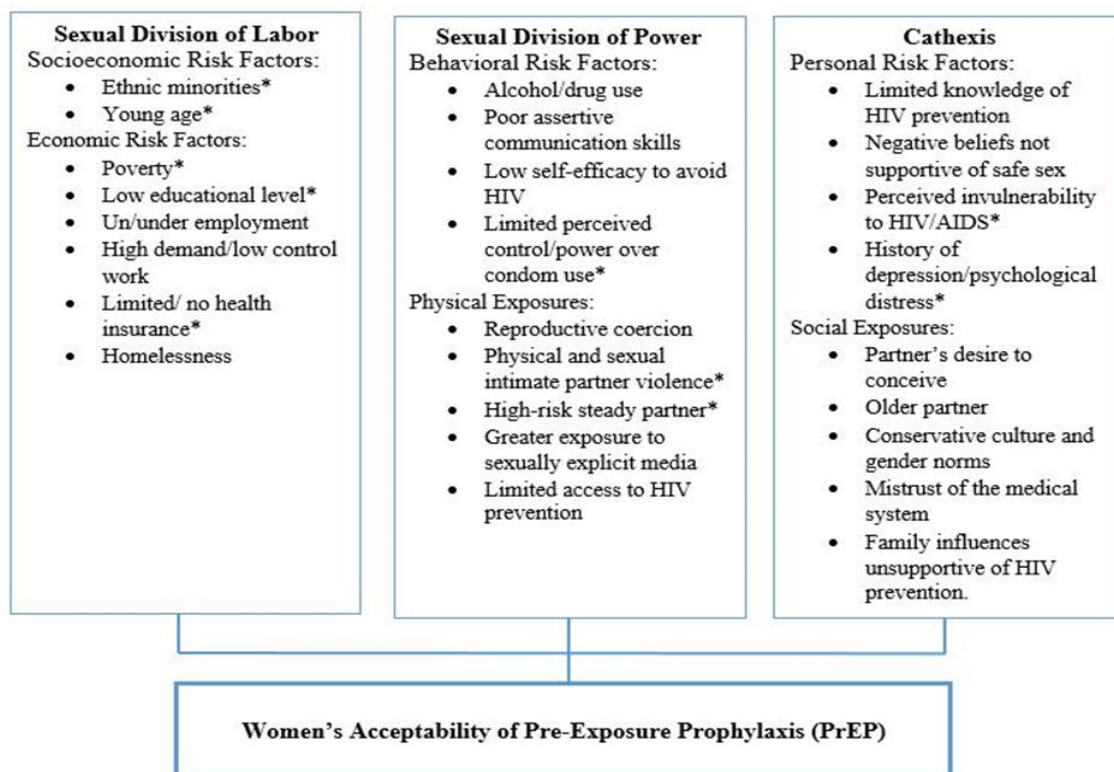
In the U.S., the Southern region is the geographical area most impacted by HIV (Prejean, Tang, & Hall, 2013). Prejean et al. (2013) reported that 46% of new cases of HIV in 2010 occurred in the South when compared to other regions.

Moreover, 57.2% of these cases were among African Americans and 23.8% of the cases were women. Mississippi (MS) metropolitan areas where the study was conducted ranked fourth highest in prevalence of HIV (CDC, 2015). In MS, the estimated HIV prevalence rate of African American women is 9.5 times higher than thatof White women. Clinical data shows that if taken consistently, tenofovir/emtricitabine used as pre-exposure prophylaxis (PrEP) is effective in reducing HIV infections among men and women at high risk of HIV infection (Jiang et al., 2014). In 2012, PrEP was approved by the U.S. Food and Drug Administration (FDA) and in 2014, the CDC published clinical guidelines for PrEP use in the U.S. (CDC, 2014). The guidelines dictate that those who are at substantial risk for HIV, namely those with an HIV-positive sexual partner, a recent STI infection, a high number of sexual partners, inconsistent condom user, commercial sex workers, and those who live in a HIV high prevalence network are eligible for PrEP(CDC, 2014). As opposed to condom use for HIV prevention, PrEP offers women the opportunity of direct control over protection against HIV because women's PrEP use does not depend on partner cooperation, does not require use at the time of sexual intercourse, and its use can be concealed. However, PrEP has been widely underutilized as an HIV prevention strategy for women despite women's interest and enthusiasm about this new method of prevention (Collier, Colarossi, & Sanders, 2017; Flash, Dale, & Krakower, 2017). Of the 26% of medical providers who had prescribed PrEP in 2013, 76% had prescribed to men who have sex with men (MSM) and less than a third of prescriptions were for women who have sex with men (Flash et al., 2017).

Research indicates that lack of awareness about PrEP among women and healthcare providers is the most salient barrier to PrEP use among women (Collier et al., 2017; Flash et al., 2017). Results have shown that once African American women learn about PrEP, acceptability is high (Garfinkel, Alexander, McDonald-Mosley, Willie, & Decker, 2017). However, there is little research investigating the factors influencing PrEP use among African American women and most research has concentrated on PrEP implementation among MSM (Flash et al., 2014). Research has shown that social and structural barriers that affect MSM PrEP use also affect African American women. These barriers include perceived side effects, cost of PrEP, perceived risk for HIV, stigma, and access to PrEP(Flash et al., 2014; Garfinkel et al., 2017).

2. Purpose of the Study

The purpose of the study was to evaluate factors associated with African American women's willingness to initiate PrEP, evaluate factors associated with risk for HIV, identify preferences in use of PrEP, and identify potential barriers to PrEP use. This cross-sectional study examined socioeconomic risk factors, behavioral exposures, personal risk factors, and social exposures associated with African American women's willingness to initiate PrEP and HIV risk. Additionally, the study identified potential structural barriers to PrEP use and PrEP preferences among African American women residing in a high HIV prevalence region. Factors delineated under the theory of gender and power (Connell, 1987) were used as a framework to conceptualize women's risk and willingness to use PrEP.Figure 1 illustrates the theory of gender and power components and indicates factors that were examined in the present study.

Sexual Division of Labor	Sexual Division of Power	Cathexis
Socioeconomic Risk Factors: • Ethnic minorities* • Young age* Economic Risk Factors: • Poverty* • Low educational level* • Un/under employment • High demand/low control work • Limited/ no health insurance* • Homelessness	Behavioral Risk Factors: • Alcohol/drug use • Poor assertive communication skills • Low self-efficacy to avoid HIV • Limited perceived control/power over condom use* Physical Exposures: • Reproductive coercion • Physical and sexual intimate partner violence* • High-risk steady partner* • Greater exposure to sexually explicit media • Limited access to HIV prevention	Personal Risk Factors: • Limited knowledge of HIV prevention • Negative beliefs not supportive of safe sex • Perceived invulnerability to HIV/AIDS* • History of depression/psychological distress* Social Exposures: • Partner's desire to conceive • Older partner • Conservative culture and gender norms • Mistrust of the medical system • Family influences unsupportive of HIV prevention.

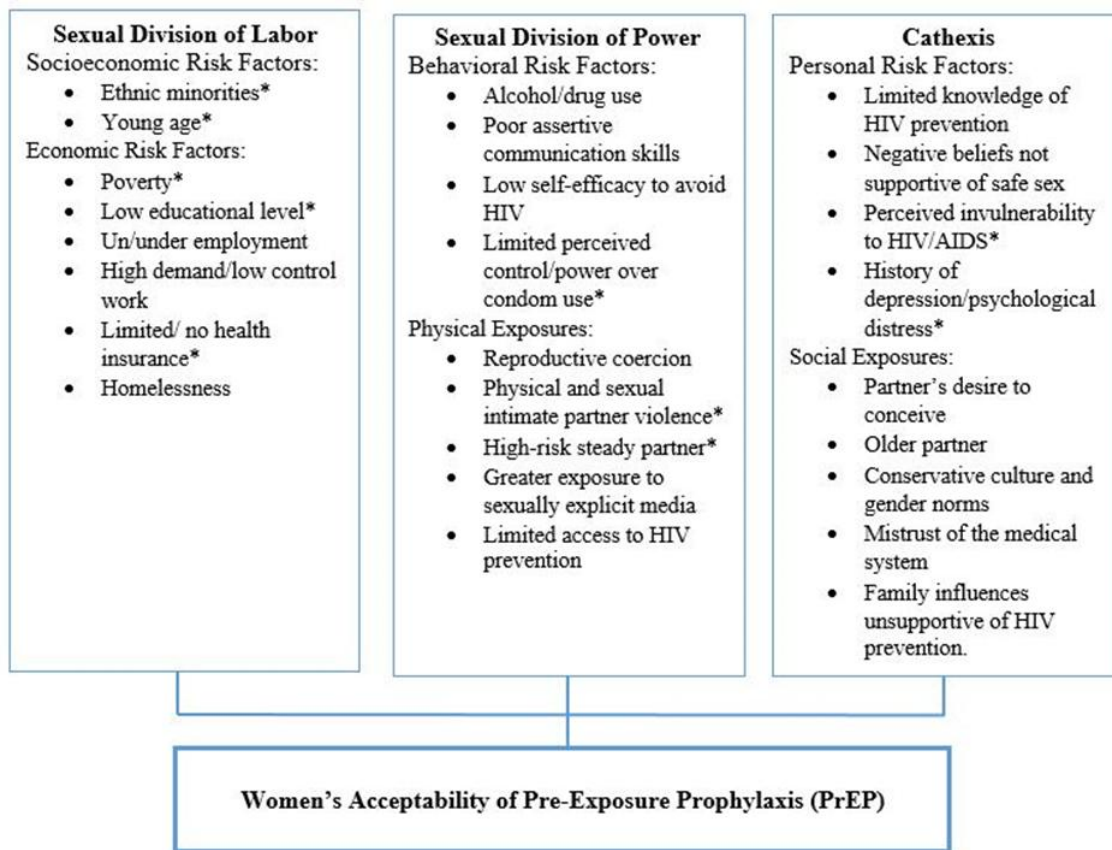**Women's Acceptability of Pre-Exposure Prophylaxis (PrEP)**

Figure 1. Application of the theory of gender and power to African American women's risk for HIV and acceptability of HIV pre-exposure prophylaxis. Adapted from "Intimate Partner Violence and PrEP Acceptability Among Low-Income, Young Black Women: Exploring the Mediating Role of Reproductive Coercion," by Willie, Kershaw, Campbell, and Alexander (2017), AIDS Behavior, p. 4. *Factors included in current study.

3. Research Questions

The following research questions were categorized by the three components of the theory of gender and power: **Sexual Division of Labor: Socioeconomic and Economic Exposures**

RQ 1: Do socioeconomic factors (i.e., age, educational level, marital status, income, health insurance status) predict African American women's willingness to initiate PrEP and HIV risk?

Sexual Division of Power: Behavioral Risk Factors and Physical Exposures

RQ 2: Does sexual relationship power predict African American women's willingness to initiate PrEP and HIV risk?
RQ 3: Does intimate partner violence predict African American women's willingness to initiate PrEP and HIV risk?
Cathexis: Personal Risk Factors and Social Exposures
RQ 4: Does perceived risk for HIV predict African American women's willingness to initiate PrEP and HIV risk?
RQ 5: Does risk for HIV predict African American women's willingness to initiate PrEP?
RQ 6: Do depressive symptoms predict African American women's willingness to initiate PrEP and HIV risk?
RQ 7: Does history of traumatic life events predict African American women's willingness to initiate PrEP and HIV risk?

Exploratory Questions

RQ 8: What factors do African American women identify as barriers to PrEP initiation?
RQ 9: What preferences do African American women have about PrEP delivery methods and services?

Hypotheses

H_0:Participants' socioeconomic factors (i.e., age, educational level, marital status, income, health insurance) do not predict their willingness to initiate PrEP.

H_1:Participants' socioeconomic factors (i.e., age, educational level, marital status, income, health insurance) will predict their willingness to initiate PrEP.

H_0:Participants' socioeconomic factors (i.e., age, educational level, marital status, income, health insurance) does not predict their willingness to initiate PrEP.

H_2:Participants' sexual relationship power will predict their willingness to initiate PrEP.

H_0:Participants' intimate partner violence does not predict their willingness to initiate PrEP.

H_3:Participants' intimate partner violence will predict their willingness to initiate PrEP.

H_0:Participants' perceived risk for HIV does not predict their willingness to initiate PrEP.

H_4:Participants' perceived risk for HIV will predict their willingness to initiate PrEP.

H_0:Participants' HIV risk does not predict their willingness to initiate PrEP.

H_5:Participants' HIV risk will predict their willingness to initiate PrEP.

H_0: Participants' symptoms of depressiondo not predict their willingness to initiate PrEP.

H_6: Participants' symptoms of depressionwill predict their willingness to initiate PrEP.

H_0: Participants' history of traumatic life events does not predict their willingness to initiate PrEP.

H_7:Participants' history of traumatic life events will predict their willingness to initiate PrEP.

H_0: Participants' socioeconomic factors (i.e., age, educational level, marital status, income, health insurance) does not predict their HIV risk.

H_8: Participants' socioeconomic factors (i.e., age, educational level, marital status, income, health insurance) will predict their HIV risk.

H_0: Participants' sexual relationship power does not predict their HIV risk.

H_9. Participants' sexual relationship power will predict their HIV risk.

H_0: Participants' intimate partner violence does not predict their HIV risk.

H_{10}. Participants' intimate partner violence will predict their HIV risk.

H_0:Participants' perceived risk for HIV does not predict their HIV risk.

H_{11}:Participants' perceived risk for HIV will predict their HIV risk.

H_0:Participants' history of traumatic life events does not predict their HIV risk.

H_{12}:Participants' history of traumatic life events will predict their HIV risk.

H_0:Participants' symptoms of depression does not predict their will predict their HIV risk.

H_{13}: Participants' symptoms of depression will predict their will predict their HIV risk.

4. Theoretical Framework

In 1987, R. W. Connell proposed the "Theory of Gender and Power." The theory formulated a framework to analyze the systematic gender-based and sexuality-based inequalities in society derived from three major structures: sexual division of labor, sexual division of power, and cathexis. According to Connell (1987), these overlapping but separate structures influence one another through mechanisms imbedded at societal and institutional levels. The societal level primarily works through the maintenance of power inequality by means of gender roles and social norms. The institutional level works within industries, schools, churches/worship establishments, the healthcare system, media outlets, families, and relationships. Wingood and DiClemente (2000) applied Connell's theory of gender and power to HIV risk in women. The authors proposed a framework to understand risks (i.e., social, behavioral, and biological factors) that plays a major role in women's health outcomes. They proposed that the existence of social and institutional mechanisms limit women by reducing their economic potential, controlling their resources, prescribing what is expected of women in society, and perpetuating gender-based inequalities. The authors argued that the *sexual division of labor* is maintained by women's and men's social allocation of occupations. Women's assignment to least valued tasks (i.e. childcare, housework, caring for the elderly) constitutes a socioeconomic risk factor to women's health. This is because women's career opportunities are restrained, which results in diminished economic potential. Although a large number of women participate in the labor force, men often hold higher status positions, have better paid jobs, get paid more for equal jobs, and constitute the majority of the labor force (Wingood& DiClemente, 2000). According to this model, the more economic inequality exists favoring men, the higher the risk for women to experience negative health outcomes, including HIV. Wingood and DiClemente (2000) conceptualized the *sexual division of power* as control and abuse of authority in sexual relationships usually at an interpersonal level but occasionally at an institutional level. The authors explained women are affected by the sexual division of power when they are dependent or dominated by a male partner. Further, the sexual degradation portrayed in media outlets also disembowels women. The authors proposed physical and behavioral risk factors for HIV infection in women. Some physical risk factors include history of sexual victimization, physical abuse, exposure to sexually explicit media, a high-risk sexual partner, partner's unwilling to practice safe sex, lack of access to sex education, and lack of access to substance abuse treatment.

Behavioral risk factors include limited perceived control in sexual relationships, limited perceived control over risk behaviors, low assertiveness, inadequate condom use, low self-efficacy to prevent HIV, and history of substance use.

The last component of Connell's (1987) gender and power framework is *cathexis*. Wingood and DiClemente (2000) conceptualized this component as the social norms and affective attachments women have with men. At the societal level and interpersonal level, this structure works by dictating "appropriate" sexual behaviors for women primarily through gender roles, stereotypes, and beliefs about women's sexuality (e.g., women should not have premarital sex, women should only have sex for procreation, women should not touch their own bodies, women should be sexy but not sexual, etc.). Some social and interpersonal risk factors include having an older partner, traditional family beliefs, distrust of the health care system, conservative gender norms, religious beliefs about use of contraception, limited education about HIV prevention, negative attitudes about condoms, and history of depression or psychological problems (Wingood & DiClemente, 2000). The authors contended that women who adhere to these conventional social beliefs will experience higher risk of negative health outcomes.

5. Methodology

5.1 Participant Sampling

The total sample consisted of 190 female undergraduate and graduate students enrolled in a historically Black university. Although, the target population was African American women, participants were not excluded based on race/ethnicity. To participate, individuals had to be between 18 and 44 years old (reproductive age), never have taken PrEP, report being HIV negative or not knowing their status, able to read and understand English, and provide written informed consent. The age range of the sample was 18 to 44 years ($M = 22.44$, $SD = 5.14$). The majority of the respondents were African American (89.5%), single (72.1%), educated ($M_{years} = 14.74$, $SD_{years} = 2.29$), and insured (62.1%). Demographical characteristics of the participants are presented on Table 1 below.

Table 1Demographic Characteristics of the Sample

Demographic Characteristics	*M*	*SD*	*n*	% of sample
Age	22.44	5.145	190	100%
Race/Ethnicity				
African American/Black	-	-	170	89.5%
Latin/Hispanic	-	-	3	1.6%
Biracial	-	-	2	1.1%
White/Caucasian	-	-	11	5.8%
Other	-	-	3	1.6%
Missing	-	-	1	0.5%
Marital Status				
Single	-	-	137	72.1%
Married	-	-	11	5.8%
Divorced	-	-	2	1.1%
Separated	-	-	1	0.5%
Long-term relationship	-	-	37	19.5%
Missing	-	-	2	1.1%
Sexual Orientation				
Heterosexual	-	-	166	87.4%
Lesbian	-	-	8	4.2%
Bisexual	-	-	12	6.3%
Other	-	-	3	1.6%
Missing	-	-	1	0.5%
Years of Education Completed	14.74	2.299	186	97.9%
Missing	-	-	4	2.1%
Income				
Less than $10,999	-	-	45	23.7%
$10,000-$19,999	-	-	23	12.1%
$20,000-$29,999	-	-	22	11.6%
$30,000-$39,999	-	-	31	16.3%
$40,000-$49,999	-	-	24	12.6%
$50,000-$59,999	-	-	16	8.4%
$60,000 and above	-	-	25	13.2%
Missing	-	-	4	2.1%
Poverty				
Below federal poverty line	-	-	84	44.2%
Above federal poverty line	-	-	102	53.7%
Missing	-	-	4	2.1%
Health Insurance				
Insurance all the time	-	-	118	62.1%
Insurance part of the time	-	-	35	18.4%
Never had insurance	-	-	22	11.6%
Missing	-	-	15	7.9%

5.2

Measures

The present study was developed and delivered via Qualtrics Survey Software. The online survey contained the following measures:

Self-Designed Demographics Questionnaire. This questionnaire consists of items that ask about age, gender, race/ethnicity, educational level, marital status, sexual orientation, years of education completed, income level, health insurance status, and HIV status.

The Sexual Relationship Power Scale (SRPS). The SRPS was utilized to measure women's level of power in their sexual relationships (Pulerwitz, Gortmaker, &DeJong. 2000). The SRPS was designed and validated using a mostly Latina participants from a community sample.

The instrument consists of 23 items that ask the participant to rate statements (using a four-point Likert scale ranging from strongly disagree, disagree, agree, to strongly agree) about the dynamics of their relationship with a steady partner. Additionally, it asks the participant to rate who has more say in the relationship: the partner, both equally, or the participant. The SRPS is comprised of two subscales: Relationship Control factor and Decision-Making Dominance factor. The Cronbach's alphas for the subscales were .84 and .60 respectively. The SRPS overall Cronbach's alpha was .85. Pulerwitz, Gortmaker, and DeJong(2000) qualified sexual relationship power as low (1-2.430), medium (2.431-2.820) or large (2.821-4.0) based on overall score. Example of items of the SRPS include, "My partner tells me who I can spend time with" and "Who usually has more say about whether you have sex?".

The Women Abuse Screening Tool (WAST). The WAST was utilized to measure women's experience with intimate partner violence (Brown, Lent, Schmidt, & Sas, 2000). The WAST is an 8-item self-report questionnaire that assesses for physical and emotional partner abuse. The WAST was validated using abused and non-abused sample of English-speaking women in a clinical health care setting. The WAST uses a three-point frequency scale of abuse events (i.e., often, sometimes, never) or three-point scale for tension and difficulty (i.e. a lot of tension, some tension, no tension; great difficulty, some difficulty, no difficulty). The range of scores of the WAST is 0-16 with higher scores indicating higher frequency of abuse. The Cronbach's alphas for the WAST is 0.75. Example of items of the WAST include, "In general, how would you describe your relationship?" and "Do arguments ever result in hitting, kicking or pushing?" See Appendix C for complete WAST.

The Perceived Risk of HIV Scale (PRHS). The PRHS was utilized to measure perceived risk of HIV infection (Napper, Fisher, & Reynolds, 2012). The PRHS consists of 8 items that assess sexually risky behaviors and intuitive judgment about HIV risk. The PRHS scores range from 0 to 40. Higher scores are associated with an increased number of sex partners, increased number of episodes of unprotected sex, and an increased number of episodes of having sex while high. Overall, the PRHS has good reliability ($r = 0.91$) and concurrent criterion-related validity with internal consistency ($\alpha = 0.88$).

HIV Risk Questionnaire. Participants' HIV risk was measured using 5 dichotomous questions from the National Survey of Family Growth (CDC, 2016b) related to engagement in sexually risky behaviors in the past 12 months. The CDC (2014) formulated the following indicators for PrEP prescription: women at substantial risk are those who have an HIV-positive sexual partner, had a recent STI infection, have a high number of sexual partners, use condoms inconsistently, trade sex, and women who live in a HIV high prevalence network (e.g., Jackson, MS). Accordingly, the present study's HIV risk questions were selected from a national epidemiological study of adults with indications for PrEP prescription (Smith, 2015). Example questions include "In the last 12 months, have you been treated or received medication from a doctor or other medical care provider for a sexually transmitted disease like gonorrhea. Chlamydia, herpes, or syphilis?" and "In the last 12 months, have you had sex with a male who you knew was infected with the AIDS virus?" Responding "Yes" to any HIV risk question indicates elevated HIV risk.

Patient Health Questionnaire-9 (PHQ-9). The PHQ-9 was used to measure symptoms of depression (Kroenke, Spitzer, & Williams, 2001). Items on the measure are based on the depression symptoms listed in the Diagnostic and Statistical Manual of Mental Disorders- Fourth edition (DSM-IV). Respondents rank the amount of distress caused by each item on a four-point scale starting at 0 meaning not experiencing the symptom at all and ending at 3 meaning experiencing the symptoms every day. A review of the validation studies completed for the PHQ-9 revealed that the measure has predictive validity for Major Depressive Disorder when compared the DSM-IV, has a sensitivity of 0.80 (95% CI 0.71–0.87) and a specificity of 0.92 (95% CI 0.88–0.95). A score of 15 or above on the PHQ-9 is indicative of major depression.

Life Events Checklist (LEC). The LEC is a self-report measure that assesses exposure to potential traumatic experiences (Gray, Litz, Hsu, & Lombardo, 2004). The LEC consist of 16 items known to be traumatic in nature. Respondents list if any event happened to them personally, if they witnessed it happen to someone else, if they learned about it happening to someone close to them, or if they are not sure, or it does not apply. High scores on the LEC indicate higher frequency of traumatic life experiences. The LEC has demonstrated good convergence validity with previously established measures of trauma histories. With regards to reliability, the mean kappa for all LEC items was .61, and the retest correlation was $r = .82$. The LEC was significantly associated to other measures of traumatic exposure, psychopathology, and post-traumatic stress (Gray et al., 2004).

Willingness and Barriers to Initiate PrEP Questionnaire. Participants' willingness to initiate PrEP was assessed using a self-designed dichotomous question: "Would you be willing to take PrEP if the medication was available?" Further, barriers and facilitators to PrEP initiation and preferences to PrEP uptake were measured using 12 self-designed questions.

Example questions include "Would you be more likely to take PrEP if you knew your partner was HIV positive? What are some reasons you would be concerned about taking PrEP? Check all that apply" and "Where would you like to receive PrEP services? Check all that apply."

Social Desirability. Participant's tendency to respond in a socially desirable style was measured using the Marlowe-Crowne Social Desirability Scale (MCSDS; Crowne & Marlowe, 1960). The MCSDS is a widely used measure of social desirability and has been used to measure social desirability in multiple populations (Tatman, Swogger, Love, & Cook, 2009). Scores of the MCSDS are qualified as low (0-8), average (9-19) and high (20-33). The MCSDS has a Cronbach's alpha of .88 and a test-retest correlation of .89. Both short and long versions of the MCSDC have been shown to be valid and highly correlated with other measures of social desirability (Fischer & Fick, 1993). Example items include: "I never hesitate to go out of my way to help someone in trouble" and "There have been times when I was quite jealous of the good fortune of others" (Crowne & Marlowe, 1960, p. 34).

6. Research Design

Participants were recruited from a historically Black university located in Mississippi. Participants were offered extra credit in their classes in exchange for their participation in the study. Participants were provided a web link to the study survey. After obtaining informed consent, all participants were administered an online survey questionnaire. Next, they were shown a brief educational video about PrEP (http://whatisprep.org/). Next, participants were administered the willingness and barriers to initiate PrEP questionnaire. Last, all participants were provided with contact information to a local health care facility that provides PrEP services.

6.1 Data Analysis

A G*Power 3.1 statistical power analysis program was used to determine desired sample size. A G*Power analysis with a medium effect size for a stepwise regression with 13 predictors indicated a recommended sample size of at least 127 participants to achieve adequate statistical power.

6.2 Statistical Analyses

First, both Pearson and Spearman correlations were performed to determine if sociodemographic variables (i.e., age, education years, marital status, income, health insurance), sexual relationship power, intimate partner violence, perceived risk for HIV, HIV risk, symptoms of depression, and history of trauma were significant correlated with willingness to initiate PrEP. Second, a hierarchical logistic multiple regression analysis was performed using variables significantly correlated with willingness to initiate PrEP, while controlling for significantly correlated sociodemographic variables (i.e., age, education years, marital status, income, health insurance) and social desirability, to predict willingness to initiate PrEP. Another set of statistical analyses was performed to predict women's risk for HIV.

Again, both Pearson and Spearman correlations were performed to determine if sociodemographic variables (i.e., age, education years, marital status, income, health insurance), sexual relationship power, intimate partner violence, perceived risk for HIV, symptoms of depression, and history of trauma are significant correlated with risk for HIV. Next, a hierarchical multiple regression analysis was performed using variables significantly correlated with risk for HIV, while controlling for significantly correlated sociodemographic variables (i.e., age, education years, marital status, income, health insurance) and social desirability, to predict risk for HIV.

Forty-nine participants' responses were discarded due to large amounts of missing data, making the sample size 141. Each predictor variable was analyzed. Overall, participants reported high levels of sexual relationship power in the Sexual Relationship Power Scale ($M = 3.06$; $SD = 0.38$). Most respondents reported a low frequency of intimate partner violence in the Women Abuse Screening Tool ($M = 2.34$; $SD = 2.47$). There was high variability in participants' Perceived Risk of HIV Scale scores; however, most respondents perceived a medium risk for HIV ($M = 14.7$; $SD = 5.32$). The majority of the participants did not endorse any HIV risk question indicating a low risk for HIV ($M = 0.15$; $SD = 0.374$). There was high variability in participants' symptoms of depression. Most respondents reported mild levels of depression on the Patient Health Questionnaire-9 ($M = 6.17$; $SD = 5.92$). Results indicate that 19 of the participants endorsed enough symptoms to possibly qualify as having a depressive disorder. There was high variability in participants' score on the Life Events Checklist. Most respondents reported several traumatic experiences ($M = 8.04$; $SD = 7.15$). Participants' scores on the Marlow-Crowne Social Desirability Scale indicated average levels of social desirability ($M = 17.91$; $SD = 5.18$).

6.3 Correlations

Pearson's *r* and Spearman's *rho* were performed to test the relationship among the socioeconomic variables (i.e., age, educational level, marital status, income, health insurance), social desirability, and study variables (i.e., sexual relationship power, intimate partner violence, perceived risk for HIV, HIV risk, history of traumatic life events,

symptoms of depression, and willingness to take PrEP). Alternative hypotheses 1 through 7 stated that socioeconomic variables (i.e., age, educational level, marital status, health insurance) and study variables (i.e., sexual relationship power, intimate partner violence, perceived risk for HIV, HIV risk, history of traumatic life events, symptoms of depression) will predict participants' willingness to initiate PrEP. Correlation analyses revealed that the only variables significantly associated with willingness to initiate PrEP were two control variables: marital status and social desirability; and two study variables: intimate partner violence and history of traumatic life events. Alternative hypotheses 2 through 5, and 7 were not supported, thus the null hypotheses were accepted.

There was a significant negative correlation between marital status and willingness to take PrEP, *rho* (139) = -.308, *p* = .05, with "separated" status particularly associated with willingness to initiate PrEP; no other socioeconomic characteristic was significantly correlated with willingness to initiate PrEP. There was a significant negative correlation between social desirability and willingness to take PrEP, *rho* (139) = -.408, *p* = .001; with lower levels of social desirability associated with willingness to initiate PrEP. There was a significant positive correlation between intimate partner violence and willingness to take PrEP, *rho* (139) = .169, *p* = .05, indicating that higher scores in the intimate partner violence were associated with willingness to initiate PrEP. There was a significant positive correlation between history of traumatic life events and willingness to take PrEP, *rho* (139) = .212, *p* = .05; indicating that higher number of traumatic life events were associated with willingness to initiate PrEP. Given these significant associations, physical and sexual violence-related items on the LEC were selected (i.e., items 6, 7, 8, and 9) and scored for each participant to form a physical/sexual trauma score. There was a significant positive correlation between physical/sexual trauma scores and willingness to take PrEP, *rho* (139) = .266, *p* = .001, indicating that higher scores in physical and sexual trauma were associated with willingness to initiate PrEP.

Alternative hypotheses 8 through 13 stated that socioeconomic variables (i.e., age, educational level, marital status, health insurance) and study variables (i.e., sexual relationship power, intimate partner violence, perceived risk for HIV, history of traumatic life events, symptoms of depression) will predict participants' HIV risk. Correlation analyses revealed that the only variables significantly associated with HIV risk were intimate partner violence and perceived risk of HIV. Alternative hypotheses 8, 9, 12, and 13 were not supported, and thus the null hypotheses were accepted.There was a significant positive correlation between intimate partner violence and participants' HIV risk, *r* = .167 *n* = 154, *p* = .03, indicating that higher levels of intimate partner violence was associated with higher levels of HIV risk; there was a significant positive correlation between perceived risk of HIV and participants' HIV risk, *r* = .185 *n* = 155, *p* = .02, indicating that higher perceived risk of HIV was associated with higher levels of HIV risk.

6.4 Predictive Models

Given the significant correlation between history of traumatic life events, intimate partner violence, marital status, and social desirability, and willingness to initiate PrEP, these variables were retained for a regression analysis.

To test hypothesis 1 and 6, a logistic hierarchical multiple regression analysis was used to assess the ability of history of traumatic life events and intimate partner violence to predict willingness to initiate PrEP, after controlling for marital status and social desirability. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. The model containing control variables was statistically significant, χ^2 (5, N = 141) = 43.66, *p*< .001, indicating that the model was able to distinguish between respondents who reported being willing and not being willing to initiate PrEP. The model containing control variables explained between 26.6% (Cox and Snell R square) and 35.6% (Nagelkerke R square) of the variance in willingness to initiate PrEP, and correctly classified 71.6% of cases. The full model containing intimate partner violence and history of traumatic life events was statistically significant, χ^2 (7, N = 141) = 44.33, *p*< .001, indicating that the full model was able to distinguish between respondents who reported being willing and not being willing to initiate PrEP. The full model explained between 27.2% (Cox and Snell R square) and 36.4% (Nagelkerke R square) of the variance in willingness to initiate PrEP, and correctly classified 73% of cases. Specifically, the model correctly classified 67.7% of participants not willing to take PrEP and 77.6% of participants willing to take PrEP. The strongest predictor of reporting willingness to initiate PrEP was social desirability, recording an odds ratio of .081. This indicated that respondents who were willing to initiate PrEP were less likely to report high scores in social desirability, while controlling for all other factors in the model. These results indicate that hypotheses 1 and 6 were supported, however, hypotheses 2, 3, 4, and 5 were not supported.

Given the significant correlation between intimate partner violence, perceived risk of HIV, and HIV risk, these variables were retained for a regression analysis. Since there were no control variables significantly correlated with participants HIV risk, these variables were not included in the regression analysis.

To test hypothesis 10 and 11, a standard multiple regression was used to assess the ability of intimate partner violence and perceived risk for HIV to predict participants' HIV risk. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. A significant regression equation was found, F (2, 151) = 3.772, p < .05, with an R^2 = .035. The model explained only 3.5% of the variance in HIV risk; the unique contribution of perceived risk for HIV was 1.96% and the unique contribution of intimate partner violence was 1.32%. These results indicate that hypotheses 10 and 11 were supported, however, hypotheses 8, 9, 12, and 13 were not supported.

6.5 Exploratory Analyses

Results indicated that 22 participants were at elevated risk for HIV. Pearson's r and Spearman's rho were performed to test the relationship among the socioeconomic variables (i.e., age, educational level, marital status, income, health insurance), social desirability, and study variables (i.e., sexual relationship power, intimate partner violence, perceived risk for HIV, HIV risk, history of traumatic life events, symptoms of depression, and willingness to take PrEP) among participants at high risk for HIV. Correlation analyses revealed that for participants at high risk, the only variables significantly associated with willingness to initiate PrEP were one control variable: social desirability; and two study variables: intimate partner violence and history of physical and sexual trauma. There was a significant negative correlation between social desirability and willingness to take PrEP, rho (18) = -.541, p = .05; with lower levels of social desirability associated with willingness to initiate PrEP. There was a significant positive correlation between intimate partner violence and willingness to take PrEP, rho (18) = .469, p = .05, indicating that higher scores in the intimate partner violence were associated with willingness to initiate PrEP. There was a significant positive correlation between physical/sexual trauma scores (i.e., physical and sexual violence-related items on the LEC) and willingness to take PrEP, rho (18) = .627, p = .001, indicating that higher scores in physical and sexual trauma were associated with willingness to initiate PrEP. As opposed to the correlation results for all study participants, history of traumatic life events was not associated with willingness to take PrEP for participants at high risk, rho (18) = .343, p = >.05. These results indicate that physical and sexual violence in particular, are significantly associated with willingness to initiate PrEP for participants at high risk for HIV.

Correlation analyses revealed that for participants at high risk, the only variable significantly associated with HIV risk was intimate partner violence. There was a significant positive correlation between intimate partner violence and participants' HIV risk, r = .642 n = 21, p = .001, indicating that higher levels of intimate partner violence associated with higher levels of HIV risk.

6.6 Ancillary Analyses

Simple frequency analyses were used to describe participant's preferences in PrEP use and potential barriers to PrEP use. Most participants reported being HIV-negative (64.7%) with about a quarter reporting never been tested for HIV (25.3%). The majority of the participants (54.2%) had not learned about PrEP prior to reading the educational summary presented in this study.

Most participants reported willingness to take PrEP if the medication were available to them (40%), if they were at high-risk of infection (65.3%), and if they had an HIV-positive partner (62.6%). Overall, participants' main concern with taking PrEP was potential side effects (23.46%).

7. Conclusions

The present study revealed relevant factors that influence young African American women's acceptability of PrEP. In terms of socioeconomic factors, separated marital status was significantly correlated with more willingness to initiate PrEP. This finding is noteworthy given that the literature has proposed that single women are more willing to initiate PrEP. Surprisingly, no other socioeconomic factor was significantly correlated with willingness to take PrEP, including health insurance and income.

In terms of behavioral and personal risk factors, findings showed that perceived risk for HIV, actual HIV risk, sexual relationship power, and symptoms of depression were not correlated with participants' willingness to initiate PrEP. However, results indicated that participants with higher scores in intimate partner violence and higher scores in traumatic life experiences were more willing to initiate PrEP than those with lower scores. Nonetheless, the relationship among these variables was low. Arguably, women in abusive relationships may be further benefitted by using PrEP given that this HIV prevention method can be used covertly and independent from partners' consent. This unique feature may make PrEP an attractive option for women victims of partner abuse who often have difficulty negotiating condom use, ensuring mutually monogamous relationships, and controlling sexual encounters with violent partner. Therefore, PrEP use can serve as an effective alternative for women who wish to protect themselves from HIV under these circumstances.

10

Results of the present study also indicated that no socioeconomic variables significantly predicted young African American women's risk for HIV. Additionally, sexual relationship power, history of trauma, and symptoms of depression were not significantly correlated with participants' risk for HIV. These results do not support previous findings showing a relationship among age, level of education, marital status, income, health insurance status, and African American women's risk for contracting HIV. Further, these results do not support the finding that African American women with lower relationship power, more history of trauma, and higher symptoms of depression experience higher risk for contracting the virus.

Despite these findings, it is important to highlight the unique sociodemographic profile of the study sample. Overall, the present study sample possessed a restricted sociodemographic background when compared to African American women in the community. The vast majority of the sample had a low HIV risk level. Given that most of the participants were insured, educated, and above the poverty line, this study's respondents may not have the same HIV risk level and prevention needs compared to women with lower socioeconomic status, less education, and no health insurance. Accordingly, previous research has shown that level of education can serve as defining factor for women's HIV risk even when controlling for co-occurring factors (Painter, et al., 2012). The results also showed that perceived risk for HIV was significantly correlated with the participants' actual HIV risk level. Contrary to previous research findings, these results indicate that African American women accurately estimated their HIV risk. Given that HIV risk perception can be affected by HIV knowledge, it is possible that this highly educated sample already possessed an adequate knowledge about HIV and had an accurate HIV risk self-perception, which positively correlated with their actual HIV risk level.

Consistent with previous literature, the present study also demonstrated that higher intimate partner violence scores were significantly correlated with higher HIV risk. Although the correlation was low, participants who reported more intimate partner abuse also reported more HIV risk behaviors. Numerous research studies have found a link between women's history of IPV and their subsequent HIV risk. However, few studies have explored the relationship between IPV and willingness to initiate PrEP. The present study sheds light in the acceptability of PrEP use among collegiate African American women by showing that those experiencing intimate partner abuse are more likely to report potential PrEP use. Overall, most participants did not know about PrEP prior to engaging in the present study. Despite this fact, 40% of the sample reported willingness to initiate PrEP. Women were more motivated to report potential PrEP use if they thought they were at high risk of infection or if they had an HIV-positive partner. Nonetheless, a large proportion of the sample reported that PrEP would not be useful to them. The generalized low risk level of the sample may explain why respondents did not feel PrEP would be useful to them. Notably, only 22 participants potentially met criteria for a PrEP prescription. Moreover, participants reported some concerns with taking PrEP including fear of side effects and cost of the medication.

In general, it was evident that intimate partner abuse remained a defining factor of women's HIV risk and their willingness to use PrEP.By addressing the co-occurring needs of women at risk for HIV, namely incorporating trauma informed services, safety planning, and integrated sexual health services, public health officials will potentially increase the uptake of PrEP and prevent new HIV infections among African American women in the state of Mississippi. As a whole, this study's results indicate that young collegiate African American women have reservations about taking PrEP. Given the limited knowledge about PrEP in the community, it would be beneficial to educate the public about the existence of PrEP, the benefits of using PrEP, and the soaring HIV prevalence in the state of Mississippi, and the Southern United States. Additionally, future HIV prevention efforts should concentrate on strategizing PrEP implementation needs for women at high risk for HIV, including those in abusive relationships, as well as creating integrated interventions that address the physical, psychological, and sexual health needs of African American women.

References

Brown, J. B., Lent, B., Schmidt, G., & Sas, G. (2000). Application of the Woman Abuse Screening Tool (WAST) and WAST-short in the family practice setting. *Journal of Family Practice, 49*(10), 896-903.

Centers for Disease Control and Prevention. (2014). Pre-exposure prophylaxis for the prevention of HIV in the United States – 2014: A clinical practice guideline. Retrieved from https://www.cdc.gov/hiv/pdf/prepguidelines2014.pdf

Centers for Disease Control and Prevention. (2015). *Diagnoses of HIV Infection in the United States and Dependent Areas, 2015*. Retrieved from http://www.cdc.gov/hiv/library/reports/surveillance/

Center for Disease Control and Prevention (2016a, February 23). Lifetime Risk of HIV Diagnosis. *National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention.* Retrieved from https://www.cdc.gov/nchhstp/newsroom/2016/croi-press-release-risk.html

Center for Disease Control and Prevention (2016b). *National Survey of Family Growth.* Retrieved from https://www.cdc.gov/nchs/nsfg/index.htm

Collier, K. L., Colarossi, L. G., & Sanders, K. (2017). Raising Awareness of Pre-Exposure Prophylaxis (PrEP) among Women in New York City: Community and Provider Perspectives. *Journal of Health Communication, 22*(3), 183-189. doi:10.1080/10810730.2016.1261969

Connell, R. W. (1987). *Gender and power: Society, the person, and sexual politics.* Stanford, CA: Stanford University Press.

Crowne, D. P., & Marlowe, D. A. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology, 24*(4), 349-354.

Fischer D. G., & Fick, C. (1993). Measuring social desirability: Short forms of the Marlowe-Crowne Social Desirability Scale. *Educational and Psychological Measurement, 53*, 417-424.

Flash, C. A., Dale, S. K., & Krakower, D. S. (2017). Pre-exposure prophylaxis for HIV prevention in women: Current perspectives. *International Journal of Women's Health, 9*, 391-401. doi:10.2147/IJWH.S113675

Flash, C. A., Stone, V. E., Mitty, J. A., Mimiaga, M. J., Hall, K. T., Krakower, D., & Mayer, K. H. (2014). Perspectives on HIV prevention among urban black women: A potential role for HIV pre-exposure prophylaxis. *AIDS Patient Care STDS, 28*(12), 635-642. doi:10.1089/apc.2014.0003

Garfinkel, D. B., Alexander, K. A., McDonald-Mosley, R., Willie, T. C., & Decker, M. R. (2017). Predictors of HIV-related risk perception and PrEP acceptability among young adult female family planning patients. *AIDS Care, 29*(6), 751-758. doi:10.1080/09540121.2016.1234679

Gray, M., Litz, B., Hsu, J., & Lombardo, T. (2004). Psychometric properties of the Life Events Checklist. *Assessment, 11*, 330-341. doi: 10.1177/1073191104269954 PILOTS ID: 26825

Jiang, J., Yang, X., Ye, L., Zhou, B., Ning, C., Huang, J., . . . Liang, H. (2014). Pre-exposure prophylaxis for the prevention of HIV infection in high risk populations: A meta-analysis of randomized controlled trials. *PLoS ONE, 9*(2), e87674. doi:10.1371/journal.pone.0087674

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*(9), 606-613. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1495268/pdf/jgi_01114.pdf

Napper, L. E., Fisher, D. G., & Reynolds, G. L. (2012). Development of the perceived risk of HIV scale. *AIDS Behavior, 16*(4), 1075-1083. doi:10.1007/s10461-011-0003-2

Painter, J. E., Wingood, G. M., DiClemente, R. J., Depadilla, L. M., & Simpson-Robinson, L. (2012). College graduation reduces vulnerability to STIs/HIV among African-American young adult women. *Women's Health Issues, 22*(3), e303-e310. doi:10.1016/j.whi.2012.03.001

Prejean, J., Tang, T., & Hall, H. I. (2013). HIV diagnoses and prevalence in the southern region of the United States, 2007-2010. *Journal of Community Health, 38*(3), 414-426. doi:10.1007/s10900-012-9633-1

Pulerwitz, J., Gortmaker, S. L. & DeJong, W. (2000). Measuring sexual relationship power in HIV/STD research. *Sex Roles, 42*(7), 637-660.

Smith, T. K. (2015). Sexual protective strategies and condom use in middle-aged African American women: A qualitative study. *Journal of the Association of Nurses in AIDS Care, 26*(5), 526-541. doi:10.1016/j.jana.2015.05.006

Tatman, A. W., Swogger, M. T., Love, K., Cook, M. D. (2009). Psychometric properties of the Marlowe-Crowne social desirability scale with adult male sexual offenders. *Sex Abuse, 21*(1), 21-34.

United States Census Bureau. (2011). Overview of race and Hispanic origin: 2010. Retrieved from http://www.census.gov/prod/cen2010/briefs/c2010br-02.pdf

Wingood, G. M., & DiClemente, R. J. (2000). Application of the theory of gender and power to examine HIV-related exposures, risk factors, and effective interventions for women. *Health Education & Behaviors, 27*, 539-565. doi: 10.1177/109019810002700502

Willie, T., Kershaw, T., Campbell, J. C., & Alexander, K. A. (2017). Intimate partner violence and PrEP acceptability among low-income, young Black women: Exploring the mediating role of reproductive coercion. *AIDS and Behavior, 21*(8), 2261-2269. doi:10.1007/s10461-017-1767-9