

**Is PrEP for me? Knowledge, Attitudes, Behaviors, and Perspectives about PrEP  
among Black Women Living in the South**

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## **ABSTRACT**

Significant racial and regional disparities are associated with HIV incidence rates among Black women in the United States, particularly of those who live in the South. While strides to improve HIV prevention efforts with Black, heterosexual women have occurred, more is needed. Pre-exposure prophylaxis (PrEP) is a woman-controlled HIV prevention strategy that can combat high rates of HIV and be used without the need to negotiate with a sexual partner. Although Black women are at the highest risk for HIV acquisition, they have the lowest rates of PrEP uptake in the U.S.

The purpose of this dissertation was to expand public health understanding of the current status of HIV and AIDS prevention interventions for Black women in the U.S., highlight key aspects of recruitment ads that appeal to Black women to improve recruitment efforts for this population, and expand PrEP-related research on population characteristics and health behaviors associated with PrEP use among Black women who live in the South.

This dissertation reports on findings from three studies. Study 1 was a systematic review that provided an examination of the status of HIV/AIDS prevention interventions for Black, heterosexual women in the U.S. from 2012-2019. Findings highlight gaps in HIV/AIDS prevention interventions for Black women in the U.S., specifies sub-populations of Black women that may need more attention in terms of HIV/AIDS services and programs, and provides recommendations for current and future HIV/AIDS prevention interventions that are specified for Black women. Study 2 used formative qualitative research to examine Black women's general likes and dislikes about women-focused ads, and their preferences for ad content and ad locations in order to gain the interest of Black women to participate in health-related research. Findings not only extend the existing literature by describing aspects of online and physical ads that may appeal to Black women but highlight a specific area of featuring Black health providers as well as patients within ads that has not yet been identified in the current literature.

Study 3 used quantitative methods through the use of an online survey to identify population characteristics and health behaviors associated with general likelihood to use PrEP and whether an individual planned to start PrEP soon (i.e., in the next 3 months) among a sample of at-risk HIV-negative cisgender Black women. Findings extend current PrEP-related literature about PrEP uptake among Black women by providing insight into additional factors associated

with likelihood to use PrEP and future plan to use PrEP within this population. Findings also indicate a need to further examine how PrEP stigma may affect PrEP use among Black women.

Overall, findings from this dissertation highlight the need for additional programs and resources that improve HIV prevention strategies for Black women and help promote PrEP uptake within this vulnerable population.

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## **CHAPTER 1**

### INTRODUCTION

#### **HIV Among Black Women in the United States**

Black women are disproportionately impacted by HIV, accounting for nearly 60% of new HIV diagnoses, yet they only represent 13% of the United States (U.S.) female population (Centers for Disease Control and Prevention, 2019d). HIV surveillance from 2015 through 2019 in the U.S. and 6 dependent areas found that adult and adolescent Black women accounted for the largest numbers of HIV diagnoses each year (Centers for Disease Control and Prevention, 2019d). Although there has been a decrease in HIV diagnoses from 2015 (n=4,262) to 2019 (n=3,812), Black women still have the highest HIV incidence rates by heterosexual transmission (Centers for Disease Control and Prevention, 2019d). Unlike women of other racial groups, Black women are at greater risk of HIV acquisition due to various social and structural factors, such as being uninformed about their HIV status or their sexual partner's HIV status (Bachanas et al., 2013; Jennings et al., 2015; Seth P., 2015), low education (Adimora, Schoenbach, & Doherty, 2007; Aral, Adimora, & Fenton, 2008), low perception of personal HIV risk (Jennings et al., 2015), and lack of access to healthcare (Blackstock et al., 2015). Insufficient knowledge of HIV prevention methods, unemployment, and intimate partner violence also affects their HIV risk (Aaron et al., 2018; G. M. Wingood et al., 2013). Across the U.S., these statistics are even more alarming when examined by regions and states.

Compared to other regions in the U.S., the Southern region (herein referred to as the 'South') is considered the epicenter of the HIV epidemic. The South includes the following states: Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia (Centers for Disease Control and Prevention, 2019b). States in the South account for over 40% of all individuals living with HIV (Centers for Disease Control and Prevention, 2016, 2018b, 2019b), and consistently have the highest number of new HIV diagnoses per year (AIDS Vu, 2020; Centers for Disease Control and Prevention, 2019b). In 2019, there were 474,786 people in the South living with HIV, and 19,100 were newly diagnosed (AIDS Vu, 2020). Reasons for these statistics can be attributed to poor population health, high poverty rates, and negative health outcomes for HIV-infected individuals who live in this region (Centers for Disease Control and Prevention, 2016, 2018b; Reif, 2011).

With respect to race and gender, Black women have the highest rates of HIV diagnoses (22.2) in the South compared to women of other races (Centers for Disease Control and Prevention, 2020) and represent over 65% of all HIV diagnoses among women in this region (Centers for Disease Control and Prevention, 2016, 2018b, 2019b). As such, it is not surprising that the South is a high-priority region to decrease new HIV diagnoses among cisgender (individuals who were assigned a female sex at birth and identify their gender as female) Black women (National Institutes of Health (NIH), 2019; The White House, 2015). These findings highlight the need to improve novel comprehensive HIV prevention strategies for Black women living in the South. One such strategy is daily oral pre-exposure prophylaxis (PrEP).

### **Pre-Exposure Prophylaxis (PrEP)**

PrEP is a preventative antiretroviral medication that can reduce HIV acquisition among HIV-negative individuals (Centers for Disease Control and Prevention, 2017c; U.S Food and Drug Administration, 2012). In 2012, the U.S. Food and Drug Administration (FDA) approved the oral PrEP pill (emtricitabine/tenofovir disoproxil fumarate [FTC/TDF] or emtricitabine/tenofovir alafenamide [FTC/TAF]) for use among HIV at-risk individuals (Centers for Disease Control and Prevention, 2021a; FDA, 2021). When PrEP is taken as instructed in combination with safer sex practices (e.g., using condoms and reducing the number of sex partners), the risk of acquiring HIV is reduced by more than 90% (Baeten et al., 2012; Celum & Baeten, 2012; Centers for Disease Control and Prevention, 2021a; Choopanya et al., 2013; Grant et al., 2010; Grohskopf et al., 2013; McCormack et al., 2016; Molina et al., 2015; Thigpen et al., 2012; Van Damme et al., 2012). Since the approval of PrEP by the FDA, the Centers for Disease Control and Prevention (CDC) released two PrEP guidelines for clinical use (Centers for Disease Control and Prevention, 2018e, 2021a). Individuals are eligible for PrEP if they are HIV-negative, are at high-risk of acquiring HIV through risky sexual behaviors (e.g., unprotected sex, infrequent condom use, have multiple sex partners, have sex with persons living with HIV, have been diagnosed with an STI in the past 6 months), and/or are injection drug users (Centers for Disease Control and Prevention, 2018e, 2021a). These individuals also will need to test negative for HIV antibodies before starting PrEP and attend routine visits with their primary care provider to conduct HIV testing every 3 months once on PrEP.

The introduction of PrEP as an HIV prevention strategy has been an important step towards ending the HIV epidemic. Since its approval, PrEP use has increased in the U.S. among

at-risk populations (e.g., men who have sex with men (MSM)) (Sullivan et al., 2020) but has not adequately been extended to Black women (Chandler, Guillaume, Wells, & Hernandez, 2022; Hirschhorn et al., 2020; Sullivan et al., 2020). In 2019, only 8% of PrEP-eligible Black individuals were prescribed PrEP. In 2020, among the 1.2 million people who were prescribed PrEP, 66% were White and only 9% were Black (Centers for Disease Control and Prevention, 2021c). PrEP coverage among men was almost three times higher (28%) than for women (10%) (Centers for Disease Control and Prevention, 2021c). Further, data suggest women only comprise 4.7% of PrEP users nationwide, and only represent 2.1% of the 176,670 heterosexual women indicated for PrEP use (Huang, 2018; Siegler et al., 2018).

One of the goals of the federal *Ending the HIV Epidemic in the U.S. (EHE)* initiative is to have 50% of people who could benefit from PrEP using it by 2030 (Centers for Disease Control and Prevention, 2019a). If efforts to address these inequalities in PrEP engagement among Black women continue to remain unmet, PrEP will be limited in reaching its full potential to decrease new HIV infections within this population.

### **Conceptualizing Gaps in PrEP Uptake Among Black Women**

#### *Low PrEP Awareness = Low PrEP Uptake*

For effective prevention strategies like PrEP to be utilized at peak capacity, those who need it must first be aware that it is available. Low PrEP awareness and knowledge about PrEP among women has been found across various studies (Auerbach, Kinsky, Brown, & Charles, 2015; Collier, Colarossi, & Sanders, 2017). This may be attributed to lack of female-focused PrEP messaging within PrEP awareness campaigns. In a published literature review about the approaches used to increase PrEP awareness among at-risk populations, only 2 of 9 studies targeted women and noted the need to improve screenings and referrals for PrEP services for women (Sophus & Mitchell, 2018). To conceptualize gaps in PrEP uptake, Kelley et al. (2015) and Parsons et al. (2017) created models to depict the necessary steps to acquire and use PrEP. Kelley and colleagues' model for PrEP mimicked the HIV Care Continuum (Kelley et al., 2015). Parsons and colleagues' model described the Motivational PrEP Cascade by applying the Stages of Change model (Parsons et al., 2017). Findings from both studies revealed a dramatic loss of participants throughout the early stages of PrEP initiation, suggesting PrEP awareness was an important and critical factor in PrEP uptake. It should be noted that both studies included only

men. In addition to needing to address PrEP awareness and knowledge among Black women, PrEP implementation gaps exist at the organizational level.

### *Discrepancy in PrEP Eligibility Criteria*

Research into PrEP uptake has identified issues in how women's eligibility for PrEP is defined (Calabrese et al., 2019; Raifman & Sherman, 2018). Specifically, PrEP eligibility is often dictated by one's knowledge of their partner's sexual risk behaviors; and PrEP eligibility criteria used to refer or prescribe PrEP are not consistent. The ways in which people come to be classified as "high risk" and thus eligible for PrEP vary across specific combinations of country/geographic location, research goals, and/or recognized medical-organization recommendations (i.e., CDC PrEP Eligibility Guidelines). For instance, heterosexual women's PrEP eligibility, defined by the Centers for Disease Control and Prevention, is determined by the characteristics and/or behaviors of their male sex partner(s) (Calabrese et al., 2019; Centers for Disease Control and Prevention, 2018e) such that women are eligible for PrEP if they are HIV-negative and have a male sex partner(s) who is a man who has sex with men, is an injection drug user, or is living with HIV (Centers for Disease Control and Prevention, 2018e). These indications are primarily dependent on disclosure by women's sexual partner(s) (Raifman & Sherman, 2018) who may not disclose their HIV status or risky sexual behaviors (Duru et al., 2006; Millett, Malebranche, Mason, & Spikes, 2005). As such, women are often unaware of their male sexual partners' HIV risk behaviors (Chen, Raymond, McFarland, & Truong, 2010; Duru et al., 2006; Millett et al., 2005). This is particularly true when their male sex partners have concurrent sexual partnerships with men and/or lifetime histories of injection drug use (Chen et al., 2010; Duru et al., 2006; Millett et al., 2005).

Moreover, when eligibility criteria vary, huge differences in PrEP uptake may occur. A comparison of two versions of the CDC PrEP eligibility criteria--guidance summary criteria and recommended indications criteria---were examined across risk and motivation categories (Calabrese et al., 2019). Although both versions require women to know their individual HIV risk behavior(s), the recommended indications criteria require women to also know both their partners' HIV status and engagement in risk-related behaviors (Calabrese et al., 2019). Results indicated more women were PrEP eligible based on the guidance summary criteria (n=559, 82.3%) than the recommended eligibility criteria (n=10, 1.5%). Variability in state-level PrEP eligibility criteria was also found. Specifically, some states used the guidance summary criteria,

while other states used the recommended criteria, which underscore the importance and reach of the CDC PrEP guidelines as a clinical standard and determinant of access (Calabrese et al., 2019). Criteria used to determine eligibility for PrEP may introduce social biases and miss potential beneficiaries. Overall, these research findings highlight a wide gap in PrEP implementation and scale-up efforts that need to be addressed.

In recent years, there has been an influx in research examining factors that may be related to potential PrEP use. For instance, it is well documented that Black women have higher intentions to use PrEP compared to other racial groups of women (Bond & Gunn, 2016; Calabrese et al., 2018; Calabrese et al., 2019; Garfinkel, Alexander, McDonald-Mosley, Willie, & Decker, 2017; Kwakwa et al., 2018; Sales et al., 2019; Tekeste et al., 2018), yet are still underrepresented among PrEP users. More research is needed to better understand the population characteristics and health behaviors that may influence Black women's engagement with PrEP, such as general likelihood to use PrEP and factors related to one's future plan to use PrEP.

### **Recruitment and Retention of Black Women in Health-Related Research**

In order to conduct this research, generalizability and applicability of research findings require that samples are representative of the population. Recruiting and retaining Black women in research studies can be challenging, especially for non-reproductive health-related research (Wallace & Bartlett, 2013). Barriers in the recruitment of Black women include, but are not limited to, mistrust, lack of understanding informed consent, fear, potential stigma, financial/logistical reasons (e.g., transportation), and low compensation (Brooks, Paschal, Sly, & Hsiao, 2009; George, Duran, & Norris, 2014; Katz, 2008; Otado et al., 2015). Negative perceptions of research due to unethical research practices like the Tuskegee Syphilis Study (J. H. Jones, 1993) have also deterred many Black women from participating in research studies. To help investigators recruit ethnically diverse samples, researchers have disseminated in-depth methodologies that can be useful for recruitment (Hammer, 2000; Qualls, 2002; Satia, Galanko, & Rimer, 2005; Taani, Zabler, Fendrich, & Schiffman, 2020; J. Y. Taylor, 2009; Wallace & Bartlett, 2013). Despite this, more research is needed to understand the best recruitment content, images, language, and platforms (e.g., online, venues, etc.) needed to optimize recruitment efforts among Black women.

## **Statement of The Problem**

Compared to the rest of the country, Black women living in the South are uniquely burdened by HIV. Our understanding of the barriers and facilitators associated with Black women's intentions to use PrEP is limited. Moreover, recruiting and maintaining Black women in these studies have proven challenging. More research is needed to better understand how to effectively engage and recruit Black women in research studies using advertisements and specific messaging. Moreover, HIV prevention research with Black women requires theoretical guidance to consider how population characteristics, health behaviors, and personal beliefs may affect Black women's engagement with PrEP. While theoretical frameworks exist and may help to capture individual information and relate it to factors that dictate PrEP uptake, these frameworks do not consider how HIV-related risk factors, personal and relational characteristics, and health behaviors specifically affect PrEP engagement among Black women.

## **Conceptual Framework**

Using a theoretical framework that accounts for the multilevel factors that may influence PrEP engagement can help to better capture and understand Black women's awareness, attitudes, and motivations around PrEP engagement. To account for these multilevel factors, the current study used an integrated model created by Lambert and colleagues (2018) to organize factors related to potential PrEP uptake among Black women (Figure 1.1) (Chapman Lambert, Marrazzo, Amico, Mugavero, & Elopre, 2018). This conceptual model includes constructs from the Situated Information-Motivation-Behavioral (sIMB) model and Anderson's Behavioral Model (AMB). The sIMB is an adaptation of the Information-Motivation-Behavioral Skills (IMB) model. The IMB model was created to understand and promote healthy behaviors and has been used to conceptualize factors that influence PrEP uptake among MSM (Dubov, Altice, & Fraenkel, 2018). The premise of IMB is that HIV prevention information and motivation are determinants of HIV prevention behavior solely because they increase HIV prevention behavior skills (Collier, Colarossi, & Sanders, 2018; Dubov et al., 2018). Thus, the application of IMB asserts that PrEP-related knowledge and motivation to take PrEP work to influence PrEP uptake (Dubov et al., 2018). The sIMB expands on this concept, including the ability to evaluate the overall impact of socio-environmental and psychosocial determinants related to PrEP use. Anderson's Behavioral Model (ABM) (Aday & Andersen, 1974; Andersen, 1995; Babitsch, Gohl, & von Lengerke, 2012) is a widely used framework for investigating the use of health

services, as well as HIV care and antiretroviral treatment (ART) adherence. ABM has been applied to understanding the uptake of health services in vulnerable populations in the U.S. (Chapman Lambert et al., 2018), and suggests that the use of health services is determined by factors at the individual, societal, and contextual levels. In Lambert's integrated model, there are 4 overarching components: Environment, Population Characteristics (operationalized with IBM constructs), Health Behavior (integrated sIMB), and Behavioral Outcome (i.e., PrEP use).

**Environmental Factors** influence health care access and delivery of health care services, including health care delivery systems, external environmental factors, and health policies. Environmental factors include how resources are distributed geographically.

**Population Characteristics** are the individual-level factors categorized as predisposing factors, enabling factors, and perceived needs. Predisposing factors are individual socio-cultural characteristics that exist prior to HIV acquisition and include demographics (e.g., age, sex, marital status, education, race/ethnicity, and occupation), mental health, attitudes, values, and health beliefs. Enabling factors are the logistics needed to obtain care and the factors that impede or facilitate health service utilization (i.e., PrEP uptake). Perceived needs are an individual's actual need for services and sexual risk factors used to determine indications for PrEP service referral (i.e., individuals who are HIV-negative and PrEP eligible).

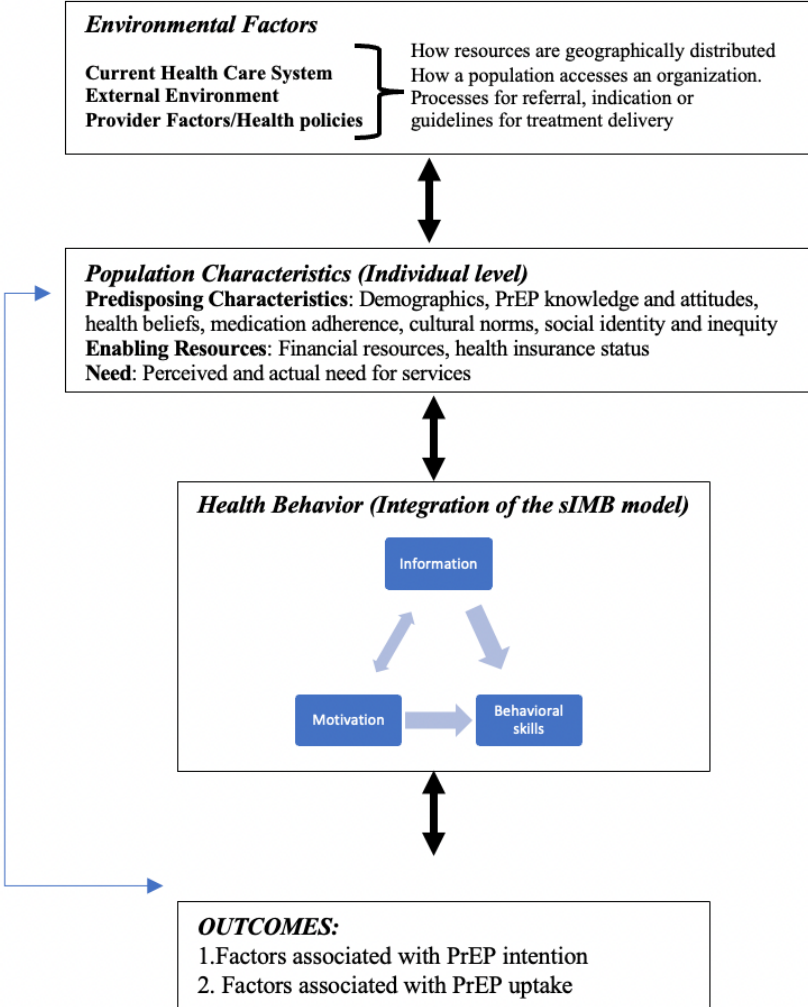
**Health Behavior** provides information on how health-related behavior can be influenced by individual and social motivations. Thus, for this integrated model to work, existing individual-level information, motivation, and behavioral skills must be assessed.

**Potential Outcomes** include factors related to PrEP engagement and uptake, including one's likelihood to use PrEP (in general) and one's plan to use PrEP in the near future (i.e., next 3 months).

This model is novel in that it can help provide a deeper understanding of individual and environmental factors associated with PrEP engagement and uptake specifically among Black women (Chapman Lambert et al., 2018). It can also help improve the evaluation of these factors, which may vary by U.S. geographic location, and help to improve our understanding of environmental and population factors that contribute to changing health behaviors related to PrEP. To my knowledge, this study is the first to use this integrated model to evaluate PrEP among at-risk, heterosexual, HIV-negative, Black women. For study 3 (Chapter 4), the integrated model helped design a survey to identify factors associated with one's likelihood to use PrEP (in

general) as well as factors that may dictate one’s plan to use PrEP in the future within a sample of at-risk HIV-negative cis-gender Black women who live in Texas.

**Figure 1.1 Integrated Model (sIMB and ABM)**



**Purpose**

The purpose of this dissertation is threefold: 1) systematically review HIV/AIDS prevention interventions for Black women in the U.S.; 2) identify aspects of recruitment materials needed to attract Black women to join a research study; and 3) identify population characteristics and health behaviors associated with Black women’s likelihood to use PrEP and future plan to use PrEP among a sample of at-risk HIV-negative cis-gender Black women. For the purposes of this study, the term “Black women” will be used and includes all women of African ancestry.

First, there has been no extensive examination of the literature with regard to any and all HIV/AIDS prevention interventions for Black women in the U.S. Previous literature reviews have examined HIV prevention interventions among Black women in several areas: 1) HIV sexual risk behaviors in older Black women (Smith & Larson, 2015), 2) social and structural determinants of HIV treatment and care among Black women living with HIV infection (Geter, Sutton, & Hubbard McCree, 2018), 3) stigma reducing interventions for African/Black diasporic women (Loutfy et al., 2015), 4) community-based interventions to increase HIV testing (Rapid Response Service, 2016), 5) depression in sexual risk reduction (Lennon, Huedo-Medina, Gerwien, & Johnson, 2012), 6) HIV risk-reduction for Black adolescent women (Hendrick & Canfield, 2017), and 7) self-management of HIV and diabetes in Black women (Tufts et al., 2015). However, these previous literature reviews are not exclusive to the U.S. and included interventions created and implemented prior to the approval of PrEP as an evidence-based HIV prevention method. These reviews also do not consider how biomedical methods for HIV prevention have changed the way in which HIV prevention is currently discussed.

Second, the recruitment of Black women into research studies continues to be a major challenge that impacts health-related research and intervention development. More detailed strategies are needed for successful recruitment of Black women, specifically as it relates to online ad content and the context in which research information is provided in these ads. This includes how ads can be more culturally appropriate in terms of images and language, as well as veracity (providing full disclosure about what a research study consists of [i.e., asking individuals to participate in an online survey and/or interview]). Third, while there is a broad range of known factors that impact Black women's motivations and uptake of HIV prevention strategies and services (e.g., condom use or decreasing one's number of sexual partners), our knowledge is limited about which factors influence Black women's likelihood to use PrEP and potential future PrEP use. Moreover, few research studies have utilized a theoretical framework created with the purpose of identifying factors associated with Black women's PrEP engagement and use.

Findings from this research study will expand our understanding of the current status of HIV and AIDS prevention interventions for Black women in the U.S., highlight key aspects of recruitment ads that appeal to Black women to improve recruitment efforts for this population,

and expand our understanding of population characteristics and health behaviors associated with potential PrEP engagement and use among Black women who live in the South.

### **Research Questions**

This dissertation is comprised of three studies to answer three different research questions. Findings from each study are presented in Chapters 2 – 4.

1. What is the current status of HIV/AIDS risk reduction prevention interventions for Black women in the US? (Chapter 2)
2. How should recruitment materials be designed to effectively attract Black women living in Texas to join a research study about HIV prevention? (Chapter 3)
3. What population characteristics and health behaviors are associated with Black women's likelihood to use PrEP and future plan to use PrEP? (Chapter 4)

## **CHAPTER 2**

### **Reducing HIV Risk Behaviors among Black Women Living With and Without HIV/AIDS in the U.S.: A Systematic Review**

#### **Abstract**

This systematic review provides an examination of the status of HIV/AIDS prevention interventions for Black, heterosexual women in the U.S. from 2012-2019. Using PRISMA guidelines, 28 interventions were identified. Over half of the interventions were: conducted in the Southern region of the U.S.; evaluated using a randomized controlled trial; focused on adults; used a group-based intervention delivery; were behaviorally focused and theoretically driven. None included biomedical strategies of PrEP, nPEP, and TasP. Few interventions included adolescent or aging Black women; none included their sex/romantic partners. Future studies dedicated to addressing the specific needs of subpopulations of Black, heterosexual women may provide opportunities to expand and/or tailor current and future HIV/AIDS prevention interventions, including offering participants with options to choose which, and the level of involvement, of their sex/romantic partner(s) in their sexual health decision-making. While strides to improve HIV prevention efforts with Black, heterosexual women have occurred, more is needed.

This study was published in the journal of AIDS and Behavior in 2020. This paper represents my original work, and I conceptualized the study, conducted the literature review, synthesized the data, and wrote the manuscript. Dr. Mitchell is co-author and assisted with confirming that articles included in this paper were relevant to the study aims, and he provided final proof reading and edits for this paper prior to journal submission.

**Key words:** HIV prevention interventions; Systematic review; Black women; United states

## Introduction

In 2018, more than 7,000 women were diagnosed with HIV in the United States (Centers for Disease Control and Prevention). Of these diagnoses, 85% (n = 6,014) were attributed to heterosexual contact; more than 1,000 cases were due to injection drug use (Centers for Disease Control and Prevention). Women's risk for HIV can increase due to their partner(s) high-risk behaviors, such as unprotected sex with other partners (male or female) and/or injection drug use (Centers for Disease Control and Prevention). There is also a differentiation in HIV risk due to age. The 2017 Centers for Disease Control and Prevention (CDC) HIV Surveillance Report (Centers for Disease Control and Prevention, 2018c) noted women over the age of 25 had higher percentages of new HIV diagnoses (25-34: 27%; 35-44: 23%; 45-54: 20%) compared to adolescent women (13-24: 14%) and women over the age of 55 (>55: 16%). However, not all women are equally affected by HIV.

Since 2014, Black women have accounted for the largest numbers of HIV diagnoses among females (Centers for Disease Control and Prevention). Black women currently account for 13% of the U.S. female population, yet in 2018, represented 58% of HIV diagnoses with 92% of these being attributed to heterosexual contact (Centers for Disease Control and Prevention). Unlike other female racial groups, Black women are at greater risk for HIV acquisition due to social and structural factors related to their: selection of sexual partners (Doherty, Schoenbach, & Adimora, 2009); their own and partners' incarceration (Brewer et al., 2014; Harawa & Adimora, 2008; Pouget, Kershaw, Niccolai, Ickovics, & Blankenship, 2010); uninformed HIV status or partner's HIV status (Bachanas et al., 2013; Jennings et al., 2015; Seth P., 2015); poverty (Adimora et al., 2007; Blackstock et al., 2015); low education (Adimora et al., 2007; Aral et al., 2008); and lack of access to healthcare (Blackstock et al., 2015). Insufficient knowledge of HIV prevention methods, racism, unemployment, intimate partner violence (IPV), and gender roles also affect Black women's risk for HIV (Aaron et al., 2018; G. M. Wingood et al., 2013). The added responsibilities of caring for children and other family members can further influence Black women's ability to cope and adjust to an HIV diagnosis (Caiola, Barroso, & Docherty, 2018).

With regard to women living with HIV (WLWH), this group represented 24% (n = 245,154) of those diagnosed with HIV in the U.S. (Centers for Disease Control and Prevention). Compared to HIV-negative women, WLWH experience different social and structural barriers

relative to access to medical care and treatment (Geter et al., 2018; The Center for HIV Law and Policy). Adherence to HIV care is the most important factor that can improve health outcomes for individuals living with HIV. In the U.S., obtaining regular HIV care and viral suppression has been identified as an issue among Black individuals (Centers for Disease Control and Prevention, 2018a). Social inequalities, domestic violence, and cultural expectations can further marginalize WLWH (The Center for HIV Law and Policy). Compared to men living with HIV, WLWH are disproportionately affected by trauma experiences and posttraumatic stress disorder (McLean & Fitzgerald, 2016; Wagner et al., 2018). WLWH are at risk for mental health disorders due to HIV related stigma (Crockett et al., 2019; Ojikutu et al., 2013; Travaglini, Himelhoch, & Fang, 2018) and perceived discrimination (Crockett et al., 2019). Lack of knowledge concerning risk of HIV transmission, lack of HIV status disclosure, and delays in linkage to care further affect WLWH. Additionally, WLWH with abusive histories have been identified as having higher rates of unprotected sex, high numbers of sexual partners, and poor adherence to treatment (Meyer, Springer, & Altice, 2011; Morales-Alemán et al., 2014; Seth, Wingood, Robinson, Raiford, & DiClemente, 2015).

Regional disparities in HIV diagnosis also exist for Black women. The Southern region of the U.S. (herein referred to as the ‘South’) is the epicenter of the HIV epidemic and includes the states of Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. In 2018, the South had the highest rate of HIV diagnosis (15.6 per 100,000) and contributed to more HIV diagnoses among females than any other region (n = 3,988) (Centers for Disease Control and Prevention). Black women in the South also had the highest rate of HIV diagnoses compared to all other female racial groups (24.6 per 100,000) (Centers for Disease Control and Prevention) and accounted for 69% of all diagnoses among women in that region (Centers for Disease Control and Prevention, 2016, 2018b). High rates of HIV diagnoses in the South may be due to poor population health, high poverty rates, and negative health outcomes for HIV-infected individuals (Centers for Disease Control and Prevention, 2016, 2018b; Reif, 2011). Despite these statistics and known factors related to Black women’s risk for HIV acquisition and/or onward transmission, limited research has been done to understand the current status of HIV and AIDS prevention interventions for Black women in the U.S.

*Systematic Reviews Examining HIV Prevention Interventions for Black Women*

Prior systematic literature reviews have examined HIV/AIDS prevention interventions for Black women in various contexts, including: sexual health (Ware, Thorpe, & Tanner, 2019); addressing depression through sexual risk reduction (Lennon et al., 2012); HIV testing (Rapid Response Service, 2016); HIV risk reduction (Hendrick & Canfield, 2017); stigma reduction (Loutfy et al., 2015); social and structural determinants of HIV treatment and patient care (Geter et al., 2018; Ruiz-Perez, Murphy, Pastor-Moreno, Rojas-Garcia, & Rodriguez-Barranco, 2017); and self-management of HIV and diabetes (Tufts et al., 2015). While these published systematic reviews have expanded our scope of the types of interventions that are available for Black women, there are aspects of these reviews that warrant further investigation of the literature.

First, previous systematic reviews that examine HIV prevention interventions for Black women include literature published prior to 2012 (Ruiz-Perez et al., 2017; Ware et al., 2019). While doing so does provide an extensive overview of the literature, it may: 1) include prevention interventions that may no longer be available; 2) may not consider the epidemiological shift in new HIV/AIDS diagnoses (e.g., the increase in new HIV/AIDS diagnoses among women over age 25 (Centers for Disease Control and Prevention, 2018c) and the elderly population (Franconi & Guaraldi, 2018); and/or 3) exclude interventions that may include recently developed biomedical HIV prevention strategies. Biomedical strategies for HIV prevention aim to significantly decrease the acquisition or onward transmission of HIV (AVERT; Padian, Buve, Balkus, Serwadda, & Cates, 2008). Biomedical strategies for HIV-negative individuals include non-occupational post-exposure prophylaxis (nPEP) (Centers for Disease Control and Prevention, 2018d), and pre-exposure prophylaxis (PrEP) (Centers for Disease Control and Prevention, 2017c). Though not a new biomedical strategy, treatment as prevention (TasP) (Centers for Disease Control and Prevention; Williams et al., 2011) and antiretroviral treatment (ART) (Centers for Disease Control and Prevention, 2019e; Masur et al., 2014) are for people living with HIV (PLWH).

Second, some prior systematic reviews have examined HIV/AIDS prevention interventions conducted both in the U.S. and internationally (Ruiz-Perez et al., 2017). While examining domestic and international interventions simultaneously is noteworthy, perceptions of Black women's risk and associated risk factors may differ in international countries compared to the U.S. (e.g., historical, and cultural contexts relative to gender and health, differences in health

care access). As such, there is a need to examine peer reviewed literature on HIV/AIDS prevention interventions among Black women primarily in the U.S.

### *Study Purpose*

Since 2012, a systematic review on all HIV/AIDS prevention interventions for Black women in the U.S., not specific to a particular outcome or sub-population, and organized with consideration for newer strategies for HIV prevention, has not been conducted. The current systematic review aims to provide an overview by 1) identifying HIV/AIDS prevention interventions for Black women in the U.S.; 2) describing the characteristics of these HIV/AIDS prevention interventions; and 3) providing recommendations for the improvement of current and future interventions for this population.

## **Methods**

### *Search Strategy*

To thoroughly examine published literature regarding HIV prevention interventions for Black heterosexual women in the U.S., the following electronic databases were searched: PubMed; Web of Science; Psych Info; Ebscohost: Health Source (consumer edition and nursing/academic edition), CINAHL, and Academic Search Complete. In consultation with an informational services and instruction librarian, studies were identified using a combination of the following MeSH terms: African American women AND (HIV OR human immunodeficiency virus) AND (prevent\* OR intervention OR risk OR reduc\* OR program OR trial\* OR experiment OR efficac\* OR impact) NOT transgender NOT incarcerated. To provide a more updated inquiry, two separate searches were conducted: May – August 2018 and November - December 2019. The same databases and search terms were used for each search. For both time frames, the query was modified to fit specific requirements of each of the databases. Manual review of reference listings from relevant studies was conducted to capture additional articles that did not appear in previous electronic database searches.

### *Criteria for Selecting Studies*

Only literature published between January 2012 and December 2019 were included in the current review. The year 2012 was chosen as a cut-off date for two reasons. First, Truvada® (a composite of tenofovir and emtricitabine) was not approved by the FDA for PrEP until 2012. Second, other prevention strategies were not as prominent in the U.S. prior to 2012 (e.g., treatment as prevention (TasP) (Centers for Disease Control and Prevention; Williams et al.,

2011) and couples-based HIV testing and counseling (CHTC)) (Leblanc & Mitchell, 2018; World Health Organization, 2012; Purcell et al., 2014).

Women within the prison system are disproportionately impacted by HIV (Altice et al., 2005; Farley et al., 2000; Talvi, 2007). The environment (e.g., the prison infrastructure (Johnson, Kondo, Brems, & Eldridge, 2015; UNODC, UNDP, & UNAIDS, 2013), prison management (Johnson et al., 2015; UNODC et al., 2013), and allocation of housing) (Strathdee et al., 2015) as well as ethical considerations regarding HIV/AIDS clinical research among those in prison (Westergaard, Spaulding, & Flanigan, 2013) can elevate women's vulnerability to (and factors associated with) HIV (Binswanger et al., 2010; Johnson et al., 2015; Strathdee et al., 2015; UNODC et al., 2013). Due to these differences in environmental, social, and economic factors, the HIV prevention needs required for women within the prison system greatly differ from women not within the prison system. For these reasons, any HIV/AIDS prevention interventions that focused on women with criminal justice involvement, incarcerated women, or women recently released from prison were not included in the current review. Additionally, due to the unique HIV risk factors and characteristics of transgender women (Centers for Disease Control and Prevention, 2017b; Garofalo, Deleon, Osmer, Doll, & Harper, 2006) compared to cisgender heterosexual women, interventions that focused on transgender women were also excluded from this review.

#### *Target Population*

Black heterosexual women were the population of interest for the current review. Interventions were not excluded if they had populations of pregnant and/or adolescent Black women.

#### *Interventions*

Interventions specifically intended for Black women, or those that had samples of 50% or more Black women were included. Of these 9 interventions, an exception was made for one intervention (No. 22), which had a mixed sample of Black men and women with 45% of women identifying as Black. With respect to theoretical frameworks used for intervention development, for any intervention in which the theory was not easily identified, authors were contacted via email to obtain additional information regarding the theoretical framework(s) or approach(es) used for their respective interventions.

#### *Comparison and Study Design*

As the purpose of this review is to provide an overview of the interventions for Black women in the U.S., interventions were not excluded based on their study design.

### *Outcomes*

All outcomes related to HIV/AIDS prevention were examined for each intervention. Specifically, interventions were categorized by the HIV status of their target population (HIV-negative, WLWH, or both HIV-negative and WLWH). The outcomes associated with each intervention by their sample's HIV status was also reported.

### *Data Extraction*

Titles and abstracts were screened by the first author, and all irrelevant articles were excluded. The second author screened the remaining titles and abstracts then excluded additional articles that did not meet the overarching goals of the current review. Full texts were obtained for the remaining articles and screened by the first author against a screening sheet detailing the inclusion and exclusion criteria. All articles that did not meet this criterion were excluded. Specifically, interventions that were not published between January 2012 and December 2019; focused on women with criminal justice involvement, women who are incarcerated, women recently released from prison, or transgender women; did not include at least 50% or more Black women in their sample population; or intervention outcomes were not related to HIV/AIDS prevention were excluded. Next, the second author screened any articles that were deemed questionable against the inclusion and exclusion checklist to determine their inclusion. Once complete, the remaining articles identified through our search were put into Excel spreadsheets. The following information items were extracted from each article:

The article title, associated authors, year, abstract; and intervention name, study design, study location, timeline for data collection, sample size, serostatus of target population (i.e., HIV-negative, HIV-positive, or both), intervention aim or purpose, hypotheses and/or research question(s) (if applicable), outcome measure(s), intervention type (behavioral, biomedical, structural, or a combination of these), intervention approach (e.g., individual, group-based), population category (e.g., IDU, couples, pregnant women, adolescents, etc.), intervention description, duration of intervention, theoretical basis for intervention development, result(s) from testing the intervention, strength(s), and limitation(s). The spreadsheets combined to create a database for all information included in this review.

## Results

The findings from the current review were reported based on the PRISMA guidelines (Moher, Liberati, Tetzlaff, Altman, & Group, 2010). The following databases were searched for the current systematic review: PubMed (n = 387), EBSCOhost (Health Source, CINAHL, Academic Search Complete) (n = 392), Web of Science (n = 800), and Psych Info (n = 383), yielding a total of 1,962 articles (see Figure 2.1). Eight additional articles were identified through searching reference lists. After deleting all duplicates (n = 740), preliminary screening of titles and abstracts led to the exclusion of 1,129 additional articles. These articles were excluded as they did not include heterosexual women, did not include 50% or more Black women, were international interventions, were conference abstracts, was an intervention that focused on populations other than heterosexual Black women or were irrelevant to the topic of the current review.

### Figure 2.1 PRISMA Diagram

Full text articles of the remaining 101 records were examined by the first author and a second reviewer (blinded initials). After review, 61 additional published articles were excluded as they did not meet our inclusion criterion. Overall, 40 published articles, representing 28 interventions were included for review. A description of each intervention is located in Appendix A with the following characteristics: intervention name and supporting article(s) (by author(s) and publication year), study location, intervention type and design, sample (cases/controls), study purpose/aim, hypothesis and/or research question(s), approach of intervention delivery (e.g., web-based, group-based, individual, etc.), and description of the intervention. All interventions are referenced in the text using an intervention number (i.e., No. #). Three interventions did not specify an intervention name and will be referred to by the article's author(s) and intervention number (Nos. 2, 10, 11).

#### *Description of Interventions*

Of the 28 interventions included in this review, 15 interventions were developed for HIV-negative Black women, 10 interventions for Black women living with HIV (BWLWH), and 3 interventions included both BWLWH and HIV-negative Black women. Eighteen interventions focused specifically on Black participants as the population of interest (i.e., 100% of the sample identified as Black), whereas nine interventions (Nos. 4, 6, 12, 15, 16, 19, 22, 25, 26) had at least 50% Black women within their sample (e.g., oversampled Black women) (Electronic supplementary material: Description of HIV/AIDS

Prevention Interventions for Black Women in the United States (n = 28) <https://doi.org/10.1007/s10461-020-03029-3>).

Of these 9 interventions, an exception was made for one intervention (No. 22), which had a mixed sample of Black men and women with 45% of women identifying as Black. All 28 interventions were behaviorally focused. Nineteen of the interventions were conducted in the South and/or evaluated using a randomized control trial (RCT). The other study designs that were used to test for intervention efficacy were: quasi-experimental (Nos. 2, 5, 10, 11, 13, 17, 20, 24); secondary data analysis (No. 17); single case study (No. 26); intent-to-treat (No. 5); mixed methods (No. 19); and a combination of qualitative and quantitative research methods (not mixed methods) (No. 16).

Just over half of the interventions were delivered in either small or large groups (n = 16) (Nos. 3, 5, 7, 10, 12, 13-15, 17, and 21-27), where 12 interventions used other approaches for delivery: individual (i.e., one-on-one (Nos. 16, 20, and 28)); via an iPod touch (No. 19); a combination of group and individual components (Nos. 4, 9, 18); the web/Internet (Nos. 1, 6, 8); theater (No. 2); through the use of amenities on a college campus (i.e., condom dispensers) (No. 11).

**Population.** All interventions included heterosexually-identified, Black women. More than 80% of interventions included adult Black women (aged 18 years or older) (n = 23); however, five of the interventions included Black women who were between the ages of 13-20 years old and HIV-negative (Nos. 1, 7, 9, 14, and 15) Refer to electronic supplementary material: Description of HIV/AIDS Prevention Interventions for Black Women in the United States (n = 28) for specific age ranges: <https://doi.org/10.1007/s10461-020-03029-3>). Three interventions were developed for aging Black women (Nos. 22, 23, and 26), including one (No. 26) that was adapted from SISTA (No. 5). Three interventions were developed for both men and women (i.e., not couples) (Nos. 12, 16, and 21), and did not specifically address relationship-related issues. None of the interventions identified in the current review were created for or included couples of Black women and their sexual or relationship partner(s).

**At-risk sub-groups.** Among all interventions, only 6 focused on women identified as a 'at risk' sub-group for HIV (Nos. 5, 8, 9, 10, 21, 28). For example, one intervention focused on sexually active substance abusing Black women (No. 9) whereas a different intervention was designed for women who had experienced IPV (No. 10) based on: 1) having experienced

physical abuse, rape, or sexual abuse within two years prior to intervention participation, and 2) having had sex with an intimate partner when [the individual] did not want to within two years prior to intervention participation (Rountree, Bagwell, Theall, McElhaney, & Brown, 2014). With respect to drug and/or alcohol use, one intervention was geared towards Black women who were non-injecting crack cocaine users (No. 21), and one focused on Black women who traded sex for money or drugs (No. 28). For individuals living with HIV, there are some groups who are more likely to transmit HIV to others and/or experience higher stigma, stress, and/or lower social support (Turan et al., 2017; Turan et al., 2019). The current review identified three interventions that enrolled women meeting some of this criterion (Nos. 20, 24, 25). Sister to Sister (No. 20) was adapted to meet the needs of homeless Black women living in Los Angeles County (Wenzel et al., 2016). Another example is Project THANKS (No. 24), which aimed to prevent and manage the multiple conditions of HIV and other chronic diseases among BWLWH with comorbidities who are substance abusers. Of interest, only one intervention aimed to improve family functioning by reducing childbearing stressors among mothers living with HIV (MOMS, No. 25).

**Culturally Informed Interventions.** Eleven interventions were culturally informed, where direct input from members of the target population was obtained during intervention development, which may have included the adaptation of specific content or messaging to help ensure the intervention was culturally appropriate and to help increase engagement (Nos. 1, 4, 5, 7, 9, 10, 12, 20, 23, 24, 26, and 27). In this context, cultural appropriateness refers to shared cultural experiences that can affect Black women's risk for acquiring HIV. For example, SHIPS (No. 4) incorporated Black cultural messaging to increase learning about reducing unprotected sex. Project Ore (No. 7) addressed cultural issues through stimulating discussions about HIV and sexually transmitted infections (STIs) with DVD clips of interviews with youth to reinforce the concept of connectedness to friends and community with an African rite of passage exercise and ritual.

To better address factors related to HIV, five interventions used input from their target community (of Black women) for intervention development: community advisory board (No. 10 and 19), community coalition board (No. 12), teen or youth advisory board (Nos. 1 and 9). One intervention, SISTA (No. 5) was created to be culturally relevant and gender appropriate by 1) having the ability to be adapted across different organizational sites; 2) using Black women as

peer leaders to lead the intervention; and 3) using culturally appropriate activities of games, role play, videos, and discussions about STIs. This particular intervention has also been adapted for different sub-populations of Black women, including for older Black women – Women to Women (W2W) (No. 26).

In addition, four interventions used community-based participatory research (CBPR) to develop or adapt the intervention (Nos. 10, 12, 22, and 23). In CBPR, diverse partners in the community are engaged (i.e., community engagement) to obtain and achieve multiple goals while addressing community-identified concerns (Minkler & Wallerstein, 2011). For example, Project Thanks (No. 23) used CBPR to develop the intervention through focus groups to better understand how Black women defined, conceptualized, and interpreted their overall health status in the context of having a chronic illness concurrent with HIV. As a result, an “overall wellness” curriculum was developed to help women adopt healthy lifestyle behaviors to prevent risk associated with chronic disease, and substance abuse associated with HIV-related health complications. HIV-RAAP (HIV/AIDS Risk Reduction Among Heterosexually Active African American Men and Women); No. 12) also used CBPR with a culture and gender sensitive approach that involved a community coalition board (CCB) to conduct a needs assessment to identify women’s health priorities and concerns (e.g., HIV/AIDS #1 health priority). The materials were then drafted, reviewed, and finalized by a panel of community and academic advisers that included African centered imagery and concepts. Staying true to CBPR, the CCB was actively involved throughout all stages of intervention development and delivery.

**Outcomes of HIV/AIDS Prevention Interventions.** Intervention effects were stratified and described based on the serostatus of each intervention’s sample population. Among interventions for HIV-negative Black women (n = 15), eleven intervention effects were identified (see Table 2.1). Of which, a number of the interventions focused on decreasing women’s engagement in unprotected sex or increasing their use of condoms (n = 12; Nos. 1-9, 11, and 14-15), increasing their knowledge on HIV/AIDS or STIs (in general) (n = 6; Nos. 1-3, 7, 8, 10), and reducing their use of substances with sex (i.e., alcohol or drug related risky sexual behaviors) (n = 7; Nos. 3, 5, 8-10, 13, and 14). Among interventions focusing on BWLWH (n = 10), seven intervention effects were identified across interventions (see Table 2.2). At least half of these interventions decreased unprotected sex or increased condom use (n = 5, Nos. 18, 20-24); increased one’s ability to communicate regarding disclosure of their HIV status, risk

reduction strategies, or social support (n = 6); and addressed psychosocial mediators of self-efficacy (n = 5) (see Table 2.2). Among interventions that included both HIV-negative women and WLWH (n = 3), ten intervention effects were identified across interventions (see Table 2.3). For example, two interventions decreased unprotected sex or increased condom use (Nos. 27 and 28), and two interventions increased HIV/AIDS or STI knowledge (Nos. 26 and 27). None of the interventions included in the current review incorporated PrEP, nPEP, or TasP.

**Table 2.1. Outcomes of HIV/AIDS Prevention Interventions for HIV-Negative Participants**

**Table 2.2 Outcomes of HIV/AIDS Prevention Interventions for Participants Living with HIV/AIDS**

**Table 2.3 Outcomes of HIV/AIDS Prevention Interventions with HIV-Negative Participants and Participants Living with HIV/AIDS**

### **Theoretical Frameworks, Models, and Approaches used for Intervention**

**Development.** Social Cognitive Theory (n = 10) and Theory of Gender and Power (n = 10) were the most used frameworks for intervention development (see Table 2.4 and Figure 2.2). Eighteen interventions incorporated two or more theories, models, or approaches (Nos. 1, 3-6, 8, 9, 11-14, 17, 18, 21-27), whereas 6 interventions used one theoretical framework, model, or approach (Nos. 7, 10, 15, 16, 19, 20). Three interventions used theories that were specifically created for use among Black individuals: 1) Nguzo Saba (No. 12), 2) NTU (No. 12), and 3) Black Feminist Theory (No. 9 and 10). Africentric perspectives, such as Nguzo Saba and NTU (i.e., the essence of life) (Foster, Phillips, Belgrave, Randolph, & Braithwaite, 1993) are used within HIV-RAAP (No. 12) to support the premise that Black individuals are “interconnected communally and influenced by community decisions and lessons to be learned (Yancey et al., 2012).”

Africentrism refers to African influences on Black culture, consciousness, behavior, and social organization (Collins, 2002; Yancey et al., 2012). According to Patricia Hill Collins (Collins, 2002), Afrocentric analyses implies that people of African descent created and re-created a valuable system of ideas, social practices, and cultures that have been essential to Black survival. Nguzo Saba principles, also known as Kwanzaa, uses African culture-infused principles of Umoja-unity, Kujichagulia-self-determination, Ujima-collective work and responsibility, Ijama-cooperative economics, Nia-purpose, Kuumba-creativity, and Imani-faith, and was specifically used to aid in discussions and activities throughout the seven-session curriculum of HIV-RAAP (No. 12) (Foster et al., 1993; Yancey et al., 2012). Black Feminist Theory (BFT) aims to address and articulate the intersectional relationship of social, political, and economic issues (i.e., racism

and sexism) within the lives and experiences of women of the African diaspora, while also creating space for Black women to consider their own experiences (Collins, 2002; Opara, 2018; Simien, 2004; Simien & Clawson, 2004). Thus, Black women learn to perceive the world and themselves from the perspective of their social group, also accounting for how they are perceived in the U.S. in a historical context. Through BFT, Black women can become empowered through consciousness changing in communities, and by taking steps to transform social institutions and inequalities (Simien, 2004; Simien & Clawson, 2004). Wechsberge and colleagues (No. 9) used BFT to guide the adaptation of Young Women’s CoOp across multiple HIV vulnerable female populations (e.g., substance using Black women), both internationally (Wechsberg et al., 2013; Wechsberg et al., 2012; Wechsberg, Luseno, Kline, Browne, & Zule, 2010) and in the U.S. (Wechsberg, Lam, Zule, & Bobashev, 2004). Alternatively, Rountree and colleagues (No. 10) used BFT to guide the cultural development of their intervention to address HIV prevention needs of Black women who have experienced IPV.

**Table 2.4 Theoretical Frameworks, Models, and Approaches Used for Intervention Development**

**Figure 2.2. Theoretical Models and Approaches Used for Intervention Development**

**Discussion**

To our knowledge, the current review is the first to summarize HIV/AIDS prevention interventions developed for Black, heterosexual women in the U.S. (specific to our inclusion criteria). Forty articles representing 28 interventions were included in this review. Fifteen interventions were created for HIV-negative Black women, ten interventions were created for BWLWH, and 3 interventions included both BWLWH and HIV-negative Black women. Of interest, 70% of included interventions were conducted in the South— a region where Black women are disproportionately affected by HIV. Though more efforts are needed to continue to decrease HIV incidence rates among Black women in this region, this finding highlights the continued effort to help improve HIV prevention efforts for this population. Additionally, no intervention focused on injection drug use as an outcome measure. Though substance abuse is an important contributing risk factor regarding heterosexual transmission of HIV and STIs among women (Centers for Disease Control and Prevention; Centers for Disease Control and Prevention; Des Jarlais, McCarty, Vega, & Bramson, 2013; El-Bassel & Strathdee, 2015; Iversen, Page, Madden, & Maher, 2015), prior research has stated, “women who use and inject

drugs remain underrepresented in many drug trials, studies, and hence in systematic review (El-Bassel & Strathdee, 2015),” evident in the current findings. As such, there may be a need to expand current prevention interventions to identify not only substance-using Black women, but those who primarily inject drugs who need additional support and access to care. Furthermore, the current review highlights three main observations regarding biomedical prevention strategies, addressing different sub-groups of Black, heterosexual women, and the option of allowing participants to involve their sexual/romantic partners in the intervention.

**Effective Biomedical Prevention Strategies.** None of the interventions in the current review included newer biomedical strategies of PrEP, nPEP, and TasP for HIV prevention. An additional online search (not included in the review) was conducted to determine if any of the 28 interventions had biomedical components (e.g., PrEP, nPEP, TasP) that were not described in their academic articles. One intervention, Sister to Sister (No. 20), included an online factsheet (revised March of 2017) on guidelines for PrEP and nPEP use in the intervention’s program materials (Electronic supplementary material: Sister to Sister Fact Sheet: <https://doi.org/10.1007/s10461-020-03029-3>) ("Sister to Sister: A Brief Skills-based HIV Risk-Reduction Program for Women in Primary Health Care Clinics FACT SHEET," 2017). Improvement of HIV prevention efforts with Black women will require the use of both behavioral and biomedical (e.g., PrEP, nPEP, TasP) approaches.

Both PrEP and nPEP aim to prevent HIV acquisition among HIV-negative individuals. While nPEP is for HIV-negative individuals believed to have been exposed to HIV (e.g., unprotected sexual intercourse or injection drug use) (Centers for Disease Control and Prevention, 2018d; Mitchell, Sophus, & Petroll, 2016). PrEP is for individuals who are HIV-negative and at high-risk for acquiring HIV (Centers for Disease Control and Prevention, 2017c, 2018e). PrEP, in particular, has the potential to empower Black women to be autonomous about their sexual health and HIV prevention options (Centers for Disease Control and Prevention, 2017c, 2018e; Raifman & Sherman, 2018). Both nPEP and PrEP can be used without a partner’s knowledge or consent, which may be important for and appealing to Black women: across the age continuum; with varying types of relationships; at risk for IPV (Braksmajer, Senn, & McMahon, 2016); who may face challenges with negotiating safer sex practices with their partners. At present, PrEP and nPEP are currently underutilized by Black women, which may be partially explained by their low awareness about these strategies as noted by one review on PrEP

awareness (Sophus & Mitchell, 2018). TasP (Centers for Disease Control and Prevention; Holmes et al., 2017; Williams et al., 2011) is another effective biomedical strategy for HIV prevention that is often implemented by community-based organizations and healthcare professionals through engagement in HIV care. The effectiveness of TasP centers on maintaining adherence to antiretroviral therapy (ART) among PLWH to ensure their viral loads remain undetectable to prevent onward transmission (Holmes et al., 2017; Kay, Batey, & Mugavero, 2016; Williams et al., 2011). In addition to addressing the importance of adherence to ART, broader awareness about TasP may help decrease HIV-related stigma and improve support toward engaging and remaining in HIV care among BWLWH.

Toward the goal of reducing HIV incidence and HIV-related disparities among Black women in the U.S., current and future HIV prevention interventions ought to include content, activities, and mechanisms to access nPEP, PrEP, and ART for TasP. The inclusion of all available biomedical strategies in interventions, regardless of Blacks women's HIV serostatus, may be beneficial as it could help improve broader awareness and uptake, as well support for using such methods. Findings from the systematic review also highlighted that additional HIV prevention interventions may be needed to address the needs of adolescent and older Black women, in addition to those with sexual/romantic relationship partners.

**Adolescent Females.** Five of the 28 interventions included in the review focused on adolescent, HIV-negative females (Nos. 1, 7, 9, 14, and 15). In 2017, the prevalence of HIV among adolescents aged 13 to 19 years in the U.S. was 8.1 per 100,000 (Centers for Disease Control and Prevention, 2018c). There were 1,060 Black adolescents diagnosed with HIV, and 128 diagnosed with AIDS (Centers for Disease Control and Prevention, 2018c). Many adolescents engage in risky sexual behaviors (e.g., multiple sexual partners, condomless sex), which increases their risk for acquiring or transmitting HIV and other STIs (Centers for Disease Control and Prevention, 2019f). Adolescents living with HIV are also less likely to be linked to care compared to other age groups (Centers for Disease Control and Prevention, 2019f). Although the National HIV/AIDS Strategy for 2020 has indicated individuals aged 13 to 24 years as a target group for reducing new HIV infections (White House, 2017), few interventions were created for adolescents as evident in our findings. Tailoring future interventions to address the HIV prevention and treatment needs of Black adolescent females may help improve HIV-related outcomes in this sub-group of women.

**Older Women.** Interventions developed for Black women who are 45 years of age and older were uncommon in the published literature, as noted by the 3 interventions identified in this review (Nos. 22, 23, and 26). Two of the interventions included BWLWH (Nos. 22 and 23) whereas the other intervention included Black women of both HIV serostatuses (No. 26). Recent reports show an increase in HIV diagnoses among older adults, with adults between 45 to 49 years having a rate of 14.1 per 100,000; and adults between 50 to 54 years having a rate of 12.5 per 100,000 (Centers for Disease Control and Prevention, 2019c). Compared to younger individuals, older adults are more likely to have late-stage HIV infection at the time of diagnosis (Centers for Disease Control and Prevention; Roberson, 2018), are less likely to be assessed for STIs due to ageism (Centers for Disease Control and Prevention), often have misconceptions about the absence of STIs, and are more likely to refuse discussing HIV due to fear of stigma (Roberson, 2018). Older adults are also at increased risk of acquiring HIV due to engaging in unprotected sexual intercourse, lacking HIV prevention knowledge, and having low self-perceived risk for HIV (Centers for Disease Control and Prevention; Smith & Larson, 2015). Comorbid conditions such as diabetes, heart disease, and cancer in addition to accelerated aging caused by HIV can provide further complications for older WLWH (Warren-Jeanpiere, Dillaway, Hamilton, Young, & Goparaju, 2014). As such, additional HIV/AIDS prevention interventions may be needed to address these specific needs of aging Black women.

**Women and Their Partner(s).** In the current review, none of the included interventions were designed for nor included Black women and their sexual and/or romantic relationship partner(s). Women's HIV-related sexual risk behaviors (e.g., condomless intercourse) are dyadic in nature. Women in relationships are at increased risk for HIV when one or both partners have more than one sexual partner, condoms are rarely or not at all used, and/or when IPV occurs (Gina M Wingood, Camp, Dunkle, Cooper, & DiClemente, 2009; Gina M Wingood & DiClemente, 2000). Although couples-based approaches to HIV prevention are available and can help address the specific vulnerability and exposure women face regarding their gender roles, culturally and biologically (El-Bassel, Caldeira, Ruglass, & Gilbert, 2009; El-Bassel et al., 2010; El-Bassel & Wechsberg, 2012), these interventions may have limitations. For example, women may not be given the autonomy to choose which sexual partner(s) to include and involve in their sexual health decision-making, as well as the level of involvement they would want their partner to have with them in the intervention. Also, the various dyadic types of sexual and/or romantic

relationships that women may have are often not fully considered in the context of couples-based interventions. According to Karney et al. (2010), “*a dyadic perspective on HIV-prevention is not the same as a relationship perspective. All relationships are dyadic, but not all dyads are relationships... Within a dyadic perspective, there can be a continuum of involvement and influence ranging from superficial (one-time encounters) to enduring (long-term relationships).*” Thereby, the incorporation of a dyadic perspective for future HIV/AIDS prevention interventions may help further our understanding of Black women’s differing relationship contexts and their associated needs relative toward having interventions tailored to better meet their desired involvement and inclusion of sexual and/or romantic partner(s). Use of a dyadic perspective could also help illuminate what relational interactions, types and other qualities affect Black women’s HIV prevention and treatment needs and associated outcomes.

Limitations to this review exist. While it is believed the current review was exhaustive, the search terms used for each database may have excluded words that could have been useful in finding additional interventions that focused on HIV/AIDS prevention interventions for Black women in the U.S. A librarian was consulted to elicit search terms that could be useful across the various databases. Due to the overlap of interventions found across databases and the data extraction strategies used, it is unlikely that many interventions were missed. To provide an overview of interventions for Black women in the U.S. with published results on efficacy, the current review did not include on-going research studies found in online databases, such as Federal RePORTER (<https://federalreporter.nih.gov/>) or Clinical Trials (<https://ClinicalTrials.gov>). It is possible some on-going studies could include a predominant sample of Black, heterosexual women, inclusive of any of the aforementioned subgroups, and are using biomedical strategies for HIV prevention. The present review further focused on interventions that either solely included or had a sample population of at least 50% heterosexual Black women, excluding the one intervention that was included. Interventions with sample populations substantially less than 50% Black women may have had different or similar findings than what is reported in this review. Differentiation between African Diasporas (i.e., African, Caribbean, Jamaican, Haitian, etc.) was also not done. Some HIV/AIDS prevention interventions may be differently effective for different populations of Black women in the U.S. relative to their African Diaspora. Further, the current review did not include interventions designed for Black, heterosexual women with a previous or current history of criminal justice involvement and/or

incarceration, including prison. As noted in prior research (Epperson et al., 2010; Strathdee et al., 2015; Underhill, Dumont, & Operario, 2014; Westergaard et al., 2013), women with recent or current involvement with the criminal justice system (i.e., incarcerated in state or federal prison) may need different approaches for HIV prevention, particularly within a prison setting, than what interventions in this review included. Due to these potential differences, a systematic review is warranted to examine the specific and unique HIV prevention needs of Black, heterosexual women who are or have been involved with the criminal justice system.

### **Conclusion**

Considering these limitations, the current review identified and described the characteristics of 28 HIV/AIDS prevention interventions for Black, heterosexual women in the U.S., accompanied with providing relevant recommendations to help improve HIV/AIDS prevention efforts for this population. There is an urgent and compelling need to reduce HIV-related disparities among Black, heterosexual women in the U.S. While notable HIV/AIDS prevention interventions have been designed to address factors related to HIV among Black women, findings highlight opportunities to improve HIV/AIDS prevention efforts with this population. Incorporating newer biomedical strategies for HIV prevention and increasing prevention efforts among certain subpopulations of at-risk heterosexual Black women may help further decrease HIV incidence rates and onward HIV transmission.

**Table 2.1. Outcomes of HIV/AIDS Prevention Interventions for HIV -Negative Participants**

Name of intervention	Decrease number of sex partners	Decrease non-viral STI	Decrease unprotected sex/increase condom use	Knowledge of living with HIV	Perceived HIV risk	Sexual communication: discussion of health concerns, sexual past, drug use with partner or disclosure of STI test results	Factors related to IPV	Increase HIV/AIDS or STI knowledge	Increase healthier sexual behavior choices/reduce sexual risk	HIV testing	Decrease alcohol or drug related risky sexual behaviors
(1) SIHLE Web			X					X			
(2) Livingston et al.			X			X		X			
(3) SIHLE/HORIZONS adaptation	X	X	X			X	X	X	X		X
(4) SHIPS			X								X
(5) SISTA	X		X						X		
(6) LSC			X								
(7) Project Ore			X	X	X			X			
(8) Safe Sistah			X			X		X			X
(9) Young Women's CoOp	X		X			X		X			X
(10). Rountree et al <sup>a</sup>							X	X			X
(11) Francis et al.			X								
(12) HIV RAAP					X				X		
(13) CLFC							X		X		X
(14) HORIZON + Supplemental Treatment	X	X	X						X		X
(15) SSR	X		X						X		
Total	5	2	12	1	2	4	3	6	5	1	7

<sup>a</sup>Outcomes reported for the intervention were not statistically significant

**Table 2.2 Outcomes of HIV/AIDS Prevention Interventions for Participants Living with HIV/AIDS**

Name of intervention	Decrease stigma (internalized or personalized)	Decrease unprotected sex/increase condom use	Communication: disclosure of HIV status, risk reduction strategies, or social support	Decrease number of sex partners	Increase engagement in care	Increase HIV/AIDS or STI knowledge	Psychosocial mediators				
							Self-esteem	Self-efficacy	Self-advocacy	Decrease in stress	
(16) Brief Disclosure Intervention			Disclosure of HIV status				Disclosure of HIV status				
(17) The Unity Workshop	X		Social support		Improved among those with PTSD or high levels depressive symptoms						
(18) Multimedia WILLOW		X	Risk reduction strategies with partner				Communication self-efficacy				X
(19) Maybe Someday: Voices of HIV-positive women	X		Disclosure of HIV status <sup>a</sup>				Coping self-efficacy				X
(20) Sister to Sister		X				X					
(21) PCI		X	Disclosure of HIV status	X			Condom use self-efficacy beliefs for partner				
(22) Project ROADMAP		X				X					
(23) Sista Powah		X								X	
(24) Project THANKS	X		Social support and communication with healthcare providers			X	Managing health and obtaining help				X
(25) MOMS											X
Total	3	5	6	1	1	3	2	5	1		4

<sup>a</sup>Unintended outcome of the intervention; was not statistically significant

**Table 2.3 Outcomes of HIV/AIDS Prevention Interventions with HIV-Negative Participants and Participants Living with HIV/AIDS**

Name of intervention	Decrease number of sex partners	Perceived HIV risk	Sexual communication: discussion of health concerns, sexual past, drug use with partner or disclosure of STI test results	Engagement in care	Decrease unprotected sex/increase condom use	HIV testing	Increase HIV/AIDS or STI knowledge	Increase healthier sexual behavior choices/reduce sexual risk	Psychosocial mediator	Decrease alcohol or drug related risky sexual behaviors
(26) W2W <sup>a</sup>						X	X	X		
(27) TGP <sup>a</sup>	X	X			X		X			
(28) SBCM	X			X	X					X
Total	1	1	1	1	2	1	2	1	1	1

<sup>a</sup>Studies who had at least one Black, heterosexual woman living with HIV/AIDS that participated

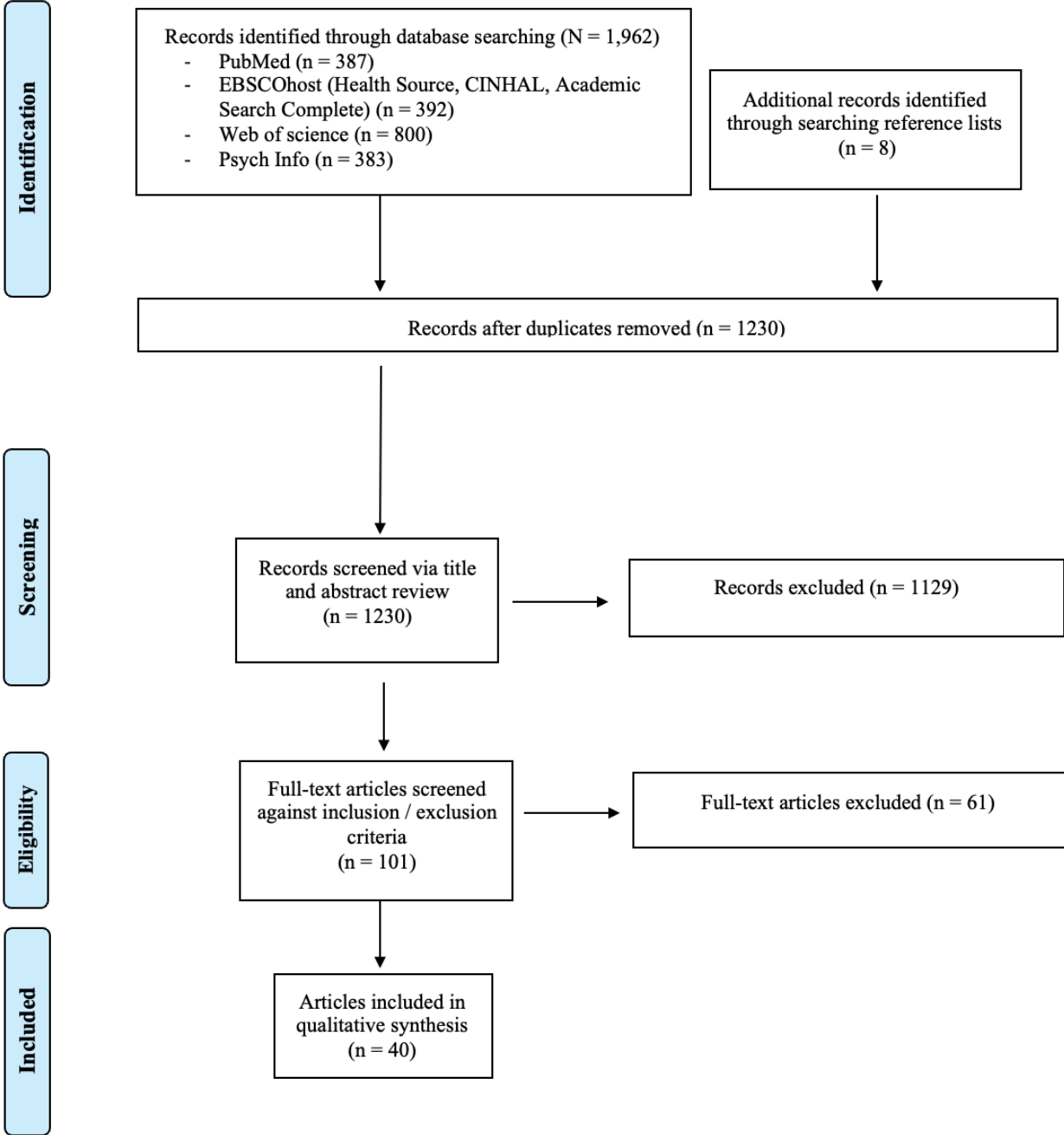
**Table 2.4 Theoretical Frameworks, Models, and Approaches Used for Intervention Development**

<b>Intervention Number</b>	<b>Theories / Frameworks/ Approaches Used in Interventions</b>	<b>Abbreviations</b>
4	Adaptive Coping Behavior	ACB
9,10	Black Feminist Theory	BFT
7	AIDS Risk Reduction Model	ARRM
23	Amherst Writers as Artists Method	AWA
25	Bowen's Family Systems Theory	FST
10,12, 23, 24	Community-Based Participatory Research <sup>a</sup>	CBPR
13	Cognitive Behavioral Therapy	CBT
14	Cognitive-behavioral problem-solving and goal setting	CPG
17	Corrigan's Principles of Strategic Stigma Change	CPSSC
16	Disclosure Decision Making Model	DD-MM
4	Edutainment <sup>a</sup>	Ed
9	Empowerment Framework	EF
13	Experimental Learning Theory	ELT
19	Qualitative Meta Synthesis <sup>a</sup>	QMS
27	Health Belief Model	HBM
15, 22	Information-Motivation-Behavioral Skills Model	IMB
11, 21	Integrative Model of Behavioral Prediction	IMBP
12	NTU	NTU
12	Nguzu Saba	NS
6	Power as Knowing Participation in Change Theory (PKPCT)	PKPCT
13	Risk and Resiliency Theory	RRT
22	Self-efficacy Theory	ST
6,	Sex Script Theory	SST
1, 3, 5, 8, 14, 18, 20, 21, 25, 26	Social Cognitive Theory	SCT
13, 17	Social Learning Theory	SLT
27	Social Norms Theory	SNT
24	Socio-ecological Model	SM
28	Strengths-Based Case Management	SBCM
2	Theater <sup>a</sup>	Theater
13	Therapeutic Alliance	TA
1, 3, 5, 8, 11, 12, 14, 18, 26, 27	Theory of Gender and Power	TGP

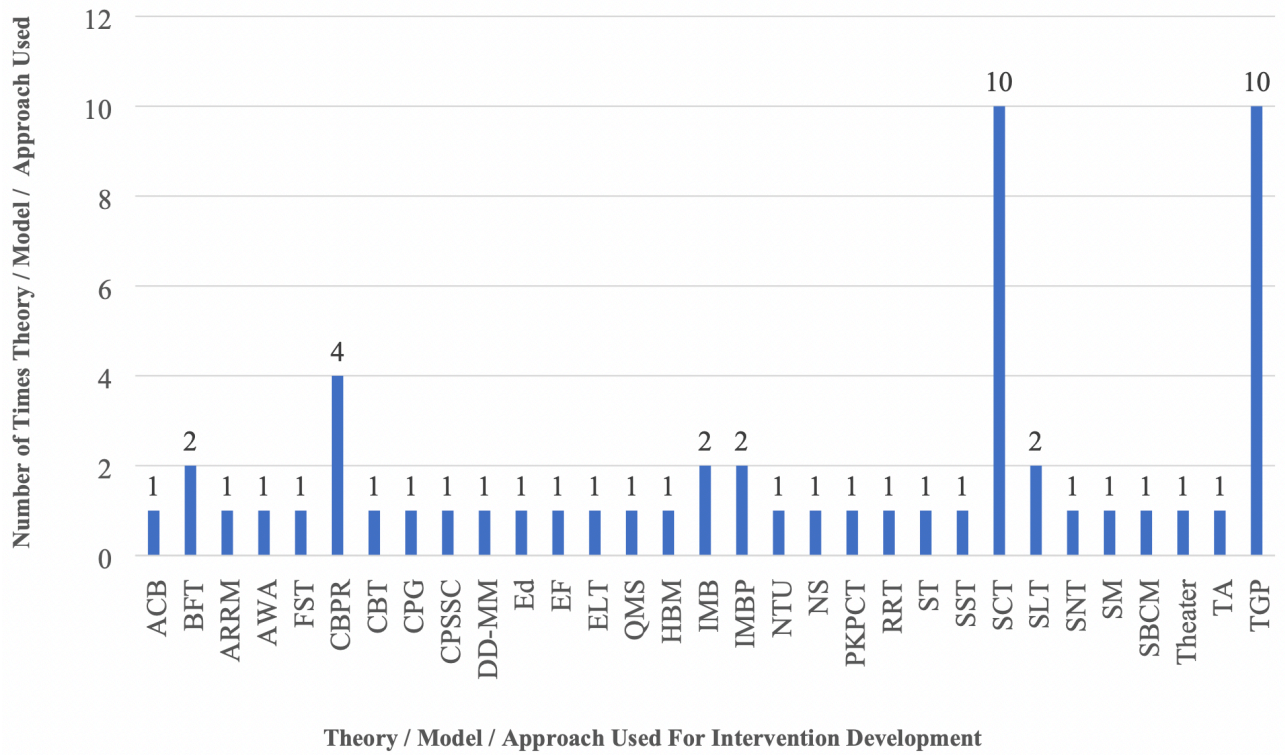
*Note.*

<sup>a</sup> Represents an approach used for intervention development. Not a theoretical framework or model. Some interventions used multiple theoretical frameworks and approaches for intervention development and/or the adaptation of an intervention.

**Figure 2.1 PRISMA Diagram**



**Figure 2.2. Theoretical Models and Approaches Used for Intervention Development**



### **CHAPTER 3**

#### **How should recruitment materials be designed to effectively attract Black women living in Texas to join a research study about HIV prevention?**

##### **Abstract**

The recruitment and retention of Black women into research studies is a major challenge that impacts health-related research and intervention development. To highlight factors that may expand on current recruitment strategies, feedback was solicited using focus groups to examine Black women's general likes and dislikes about women-focused ads, and their preferences for ad content and ad locations in order to gain the attention of Black women. Manifest content analysis was used to analyze the qualitative data. Results were organized into three pre-determined categories: 1) general opinions of ads related to women's sexual health; 2) ad content; and 3) ad location. Overall, three main sub-categories emerged from discussions: 1) visual appeal, 2) comprehensive information, and 3) representation. The sub-category "representation" was noted across all categories. Participants indicated that racial concordance is needed between the images presented in a recruitment ad and the target audience, such that images of Black women should be shown within recruitment ads in order to appeal to Black women. Findings also dictate that Black women should be represented in all roles within the ad (i.e., patient, doctor, health care worker, client), and by age. This qualitative study informed methods used to create recruitment ads for an online research study with Black women.

**Key words:** Black women, recruitment, focus group, advertisement, design

## Introduction

The success of health-related research (e.g., behavioral health research, clinical trials) and the achievement of desired outcomes depends on the ability to recruit and retain representative and culturally diverse samples. This is especially true for research about infectious diseases that disproportionately affect Black women. However, Black women continue to be underrepresented in health-related research studies (George et al., 2014; Isler et al., 2014; Mak, Law, Alvidrez, & Pérez-Stable, 2007). Historically, health-related researchers recruited white men only. With regard to gender, research norms reaffirmed the belief that research findings from male subjects could be generalized to all persons, regardless of sex. This same ideal was generalized about race, such that some believed racial populations were monolithic (Taylor, 2003). It was not until the late 1990s/early 2000s that the National Institutes of Health created and implemented guidelines for the inclusion of women and minorities in research (Epstein, 2008). While the implementation of these guidelines increased the number of women and minorities represented in health-related studies, participation and retention among these groups remain limited.

Barriers to the recruitment of Black women include, but are not limited to, mistrust, lack of understanding informed consent, fear, potential stigma, financial/logistical reasons (e.g., transportation), and low compensation (Brooks et al., 2009; George et al., 2014; Katz, 2008; Otado et al., 2015). Also, historical experiences such as unethical research practices like the Tuskegee Syphilis Study (J. H. Jones, 1993) and the story of Henrietta Lacks ("Henrietta Lacks: science must right a historical wrong," 2020; Wolinetz & Collins, 2020) not only account for the negative perceptions and attitudes Black individuals hold towards research, but also have deterred many Black individuals from wanting to participate in research altogether. Thus, there is a need to improve recruitment efforts among Black individuals. To help investigators recruit ethnically diverse samples, researchers have disseminated in-depth methodologies that can be useful for recruitment efforts (Hammer, 2000; Otado et al., 2015; Qualls, 2002; Satia et al., 2005; Taani et al., 2020; Taylor, 2009; Wallace & Bartlett, 2013). Wallace and Bartlett (2013) found that building trust, being familiar with the local community, having racial and ethnic concordance between research team members and the study participants, understanding the dynamics of the target community, and recruiting at times and locations convenient to an individual's daily life can help increase recruitment of Black women. Other studies have identified direct face-to-face interaction with individuals and groups (Gilliss et al., 2001; Otado

et al., 2015), having various modes of contact (mobile, in-person, email), providing multiple modes for the dissemination of research information (newspapers, booklets, handouts, flyers, email), snowball sampling (Otado et al., 2015), and providing participant incentives as effective methods in recruiting Black individuals (Hammer, 2000; Otado et al., 2015; Qualls, 2002; Satia et al., 2005; Taani et al., 2020). Moreover, research information should be provided in an appealing format, be clear, and be simple (Calamaro, 2008; Secor-Turner, Sieving, Garwick, Spratt, & Duke, 2010). With respect to study retention, language, cultural appropriateness, and incentives were found to be effective strategies (El-Khorazaty et al., 2007; Wallace & Bartlett, 2013). Despite these findings, recruiting Black women into research studies remains a major challenge. Aside from the aforementioned barriers, lack of interest from Black women may be due to the promotional advertisements used to recruit Black women for research.

All advertisements are created with the purpose of drawing attention to and generating a memory of a specified product and can contribute to public awareness and access to information about health-related research studies. For instance, lifestyle choices can be influenced by selective ads and marketing (Duerksen et al., 2005) such that ads can reinforce societal beliefs and reflect the interests and values of advertisers. Other than word-of-mouth or through one's social network, participants are often introduced to a research study through a recruitment ad (i.e., print ad: flyer, newspaper ad, magazine ad or web-based ad, social media, website). Advertisements should be motivationally relevant and culturally appropriate to appeal to Black women. Thus, it may be important to not only examine which recruitment strategies appeal to Black women-but also to determine the specific ad content and placement of ads that can best optimize the recruitment of Black women for health-related research.

A body of literature on recruitment advertisements targeting Black individuals does exist, but specific content regarding these advertisements is not well defined. For instance, Elish, Scott, Royak-Schaler, and Higginbotham (2009) found flyers and word of mouth to be effective in recruiting older Black women, but the authors did not provide specifics about how those flyers should look or the type of language used for word-of-mouth referrals. Taylor (2009) found that the location in which recruitment flyers are placed was important in enlisting Black participants. Overall, more research is needed to better understand what Black women want in terms of how recruitment advertisements should aesthetically look, and where exactly these ads should be placed. In order to expand on current public health literature for this topic, the current study used

formative qualitative research to examine Black women's general likes and dislikes about women-focused ads, and their preferences for ad content and ad locations in order to gain the attention of Black women.

## **Methods**

### *Study Population and Recruitment*

This study was approved by the University of Hawai'i at Mānoa Institutional Review Board. Data were collected through two online focus groups (FG) in April 2020 with Black women residing in metro Houston. Quota sampling was used to recruit women for this study (N=10). Participants were recruited via emails sent to local churches and gyms in the Houston area that have high populations of Black women. Each email provided details of the study and a link to the online eligibility screener. All women were asked to provide consent to participate in the study, then screened for eligibility via Qualtrics, a HIPAA-compliant online survey software tool provided by the University (UH-Manoa). Consent was also obtained from all participants to be audio recorded and/or video recorded. Inclusion criteria required participants to: 1) be age  $\geq 18$  years old, 2) be English speaking, 3) own a device that has a camera and allows internet use, 4) self-identify as Black (i.e., African American, Haitian American, Caribbean American, etc.), 5) self-identify as a cis-gender female, 6) report their sexual orientation as heterosexual, 7) reside in Houston, Texas, and 8) consent to participate in the study. The eligibility criteria were used in order to ensure that this exploratory study could aid in the development of recruitment materials (print flyers and online ads) that would be applicable to the target population (i.e., cis-gender Black women). Eligible and consenting women were contacted by email and phone to participate.

### *Study Procedures*

In total, there were 10 participants divided among the two FGs, five women per group. Each FG was conducted via Zoom (Zoom.us; a free online conferencing tool), audio and video recorded and lasted approximately 60 minutes. Open-ended targeted questions were used to encourage open discussion and allow participants to share their experiences and opinions regarding their preferences for advertisements geared toward Black women.

FG discussions using standard methods were used (Krueger, 2014). A semi-structured FG guide was employed (see Appendix A). The FG guide included predetermined categories based on prior literature (Duerksen et al., 2005; Elish et al., 2009; R. Jones, Lacroix, & Porcher, 2017).

More specifically, the FG covered three main topics: 1) general likes and dislikes about women-focused ads, 2) preferred ad content, and 3) ad location/placement. First, participants were asked to provide information on aspects of advertisements they preferred to see in ads about women's sexual health (i.e., vaginal health, condom use). Second, participants were asked about their preferences for information that should be included in an ad recruiting Black women for a research study. Lastly, participants were asked to provide details about where they had seen ads for research studies and the best locations for ads (i.e., flyers) to be placed in order for Black women to see them. Additional probes were added to elicit more specific details about these topics. At the end of the FG, participants were encouraged to provide any final thoughts or additional feedback regarding these topics, including factors that should be considered when developing ad content for recruitment purposes. Each participant was given a \$50 electronic gift card (via email) as compensation for their time. Overall, data from these FGs were used to obtain information to create and refine recruitment materials used to recruit Black women for an online research study.

#### *Data Analysis*

All FGs were digitally recorded, checked for accuracy, transcribed verbatim by a third-party professional transcription service (Rev.com), and anonymized. Manifest content analysis (Krippendorff, 2018; Potter & Levine-Donnerstein, 1999) was used to analyze the FG transcripts. First, all transcripts were reviewed to obtain familiarity and gain a general sense of the information. Data from each focus group were then organized based on predetermined categories. Line-by-line review for extraction of significant statements relevant to each category occurred. Sub-categories were then created and defined based on transcript data. A second reviewer (PhD Committee Member Dr. Julie Barroso) then examined the database to further refine the sub-categories and ensure the supporting text data was appropriate. Additional changes were made based on the second reviewer's feedback. All categories, sub-categories, and associated transcript text were put into an excel database. This analytic approach allowed for sub-categories and patterns to emerge from the data that may not have been anticipated by the research questions or prior research on this topic.

## Results

A total of 10 adult cis-gendered heterosexual Black women participated in the FGs; their ages ranged from 25 to 55 years, with a mean age of 36. Results were organized into three pre-determined categories: 1) general opinions of ads related to women's sexual health; 2) ad content; and 3) ad location. Various sub-categories were identified and defined by using qualitative data analysis and interpretation.

### *General Opinions of Ads Related to Women's Sexual Health*

The first category comprised of opinions and views that FG participants held about ads (e.g., ads on T.V, in magazines, on social media) that specifically promoted or disseminated information about any aspect of women's sexual health (e.g., condom use, vaginal health). Overall, three sub-categories emerged from discussions: 1) visual appeal, 2) comprehensive information and 3) representation.

*Visual appeal* was defined as the specific visual content (i.e., images, colors, or text) that respondents liked about ads for women's sexual health. Participants expressed liking ads that displayed images of real women instead of pictures of women as cartoon images. Along with these pictures, participants communicated liking ads that included "feminine" colors (i.e., pink, green, purple) as it helped the ad to stand out more.

**FG # 1 Participant 102:** *"I wouldn't want it to be like cartoon-type picture because it's like you're not taking this serious to me. So, I'd rather see something where it's like I can really relate so I need something real."*

**FG # 2 Participant 108:** *"...probably more feminine pink-looking and green stuff, purple stuff, they kind of kept my attention and see if I wanted to read more and see what it's about..."*

*Comprehensive information* was defined as the description of the product which included how to obtain it, advantages and disadvantages of using the product, and clear and simple text that provided this information. Specifically, participants voiced wanting ads that included quick, reliable, transparent, and relevant information with as few words as possible. Participants suggested providing this information as bullet points or as a list of quick pros and cons of the product. Participants also expressed wanting to know how convenient it is to obtain what is being advertised, including how easy it may be to use or gain access to what is advertised.

**FG # 2 Participant 106:** *“...since I'm young I like stuff that's more convenient, easier for me to do. So, I've seen a birth control ad on Instagram and the main thing was you download an app, put in your insurance, and then they'll just mail it to you. So, for me, convenience is what reels me in when I see ads and how convenient it is to just download an app is what made me want to get my birth control from that place. So, for me, it's always about convenience when it comes to those ads.”*

Representation was defined as the existence of concordance in terms of race and age between those viewing a recruitment ad and those within the recruitment ad. This concordance was specified in three distinct ways: race, age, and professional roles. Many respondents disliked ads that did not display a diverse representation of women by age and race. Participants stated that many ads about women's sexual health focused on younger women compared to women who are aging and typically did not include Black women.

**FG # 1 Participant 101:** *“Most ads that you see, you usually see when pertaining or when marketing things for about sex and women. A lot of times it's for the younger audience. You never really see anybody I would say 60 plus. It's usually geared toward young people. Even when you're at like the gynecologist's office, usually those pictures, it's usually a young white female if they're in the pictures or things like that. So, it's usually geared toward, I would say white females majority of the time.”*

**FG # 1 Participant 104:** *“Just more as of diversity, Spanish, black, everybody. Because first of all, we all still females, so need to see more pictures of everybody. Because like when I was talking about those condoms, when I see the commercials, it's usually white people in the commercials like black people don't use condoms.”*

**FG # 2 Participant 110:** *“I think the ones that I see on TV, they really don't have a lot of colored women. They usually have Asian women or White women and they always have younger women. They don't have women that are in their... I'm looking at it and I don't see women in their 30s or higher, it always looks like the younger women. I think some of the cons that the birth controls ads that you see on TV they don't appeal to older women. To me, they don't. They always have a younger woman jumping around, so happy, and acting like she forgot her pill.”*

In addition, women had the opportunity to add supplementary feedback and information at the end of the FG. One participant expanded on the sub-category of “representation” by stating that Black women should be represented in professional roles within the ad.

**FG # 1 Participant 105:** *“...they can switch the roles in the ads. Like I'm usually seeing the black woman that's hurting or with the white doctor telling her like, "You have this." And then they want to go ahead and then do the medicine and stuff like that. And it just pertains to*

*kind of like... I guess I'm trying to say the white doctor is our savior again, I guess. So, I would want it to be switched. I want to see maybe a black doctor telling a white patient something."*

#### *Ad Content*

Questions related to the second category, ad content, asked participants about specific information they believed should be included in research ads recruiting Black women.

Respondents voiced wanting to see 1) the purpose of the study, 2) whether an incentive will be provided, 3) the time commitment of the study, and 4) information regarding the study's accessibility, such as how convenient it is to participate.

**FG # 1 Participant 103:** *"I'd say I look for the purpose. What is this purpose? What is it going to do for me? How's it going to help this other person? Why am I being introduced to this? I kind of look into the purpose. "It's a research study? Okay." Of course, that's something I would support. So, then I actually set the next step. Is this going to take too much time? I need to know specifics" time, compensation, details. Okay, two hours, study this, you can consider or not. Okay. I know all the information that's necessary for me. That's how I proceed forward. So yeah."*

**FG # 2 Participant 107:** *"I think for me it's the timing. How long is the study and what is my part to contribute to the study? If it's something that's convenient and something that I could do, not something that would be a burden."*

**FG # 2 Participant 110:** *"I think I would want to know the time. How long it was going to be. Is it a one-day thing? Is it that you're at home or are we doing it on the video, or do we have to talk over the phone, or do you have to go to a facility? So how long would you be there. I think it also should include what would your incentive, like what you're getting for it. And I think they should tell you what the research is actually about, how your research is. For black women, they should say more what it's going to be about and what the discussion is going to be about."*

Participants also indicated the ad should provide information on whether the study is online or in-person, the privacy/confidentiality of the study, and the credentials of the person or organization conducting the study. For participants, credentials help provide trust in who participants are giving their information and provide clarity as to where that information is going.

**FG # 1 Participant 105:** *"I do feel that credentials are very important because you just don't want Bob or Sally from down the street asking you to do a research, or a study or something like that. And it's just kind of like, "Well, tell me more. What are you involved in this for?" You just want to know more about it. So, I think that's more important. You don't want to*

*just give out information and then you don't even know where that information is going. So, I do feel that credentials are very important.”*

### *Location*

The third category, location, focused on the ideal locations for recruitment ads to be placed to catch Black women’s attention and potential interest. Questions probed for the precise locations participants thought research ads (in general) should be placed, and more specifically about ads recruiting Black women to participate in a research study about sexual health and HIV prevention. First, to get an idea of locations others have used to display research ads (e.g., print or web-based), participants were asked if they had ever seen an ad for a research study, not including the FG. Only participants from the first focus group had ever physically seen a recruitment ad for a research study. These respondents reported seeing these ads as flyers on a college campus and within professional buildings like hospitals or a doctor’s office. Two participants reported seeing recruitment flyers typically in areas where they had idle time, such as on an elevator or on the door or window when entering a building.

**FG # 1 Participant 102:** *“Sometimes when I've seen them, I've been like on the elevator and I'm just forced to read them because they're posted. Usually idle time, usually kind of observing your surroundings, so you just happen to look because it's not necessarily like a beautiful painting or anything. So, it's not really... It doesn't really go with the decor, so you want to read and see like what is that saying? So, I think where it was positioned usually near an elevator or going into a building or while you're sitting in the waiting room of a doctor's office is you kind of look up and you see those types of things.”*

Next, participants were asked to provide specific locations recruitment flyers for a research study should be placed in order for Black women to see them. Across both focus groups, participants reported the bathroom/restroom and restaurants that Black individuals frequent. With regard to the bathroom, participants stated that placing flyers behind the bathroom stalls would allow for more women to see them. Some participants reported beauty salons, beauty supply stores, on college campuses, and via email as supplementary locations to view recruitment flyers.

**FG # 1 Participant 103:** *“If you think about Houston, you can do social aspects depending on what, I guess, you want your sample size to be like, I guess age-wise and whatnot. But I know if I see something on a flyer for black women at [a department store], I'm like... Take*

*a second, glance like, "What is this over here?" So, I would say some of the social and restaurants that the black people tend to go to...Maybe some of those places like a bar or a restaurant that's black-owned maybe that could kind of help sell it as well."*

Expanding on this discussion, participants were asked to provide locations where flyers should be placed that specifically aimed to recruit Black women for a research study about sexual health and HIV prevention. Participants reported similar locations as previously stated, such as the bathroom/restroom, social media, doctor's office, and schools (college campus and high schools). However, some participants noted the dressing rooms in department stores, women's clinics (i.e., Planned Parenthood) and churches as suitable locations. Social media (Facebook, Instagram, Snap Chat, or Twitter) was reported as an ideal location for flyer distribution for research studies targeting Black women (in general) as well as for a research study about Black women's sexual health and HIV prevention. In addition to the topics discussed, women had the opportunity to add additional feedback and information. Participants noted that women-centered magazines that cater to Black women, such as Ebony and Essence magazine, would also be good locations to place recruitment ads.

### **Discussion**

In this study, feedback was solicited using FGs to highlight factors that can expand on current recruitment strategies and obtain information for the creation and refinement of ads to recruit Black women for an online research study (see Chapter 4). Several findings were consistent with prior research. For instance, visual appeal, comprehensive information, and incentives are important to consider when recruiting Black women for research studies (Hammer, 2000; Otado et al., 2015; Qualls, 2002; Satia et al., 2005; Taani et al., 2020). The ad content should include the study purpose, time commitment, and aspects of what the study entails (Kubicek & Robles, 2016). Ideal locations to distribute recruitment flyers to Black women include churches (Kennedy, Bishop, Anderson, & Heyward, 2017), schools (colleges and high schools), magazines, and social media (i.e., Facebook, Instagram) (Ellish et al., 2009).

Targeted messaging has been used in advertisements to improve recruitment efforts among people of color across disciplines (Brown et al., 2015; Crane, Seburg, Levy, Jeffery, & Sherwood, 2020). Targeting the content of messaging within advertisements can help increase its personal relevance and likely increase the odds of participation among those who view the ad (Brown et al., 2012; Brown et al., 2015; Kreuter & Wray, 2003; Kubicek & Robles, 2016; Petty,

Heesacker, & Hughes, 1997). In addition to the study purpose, time commitment, and whether incentives will be provided, participants also indicated wanting to know whether the study is online or in-person, the privacy/confidentiality of the study, and the credentials of the person or organization conducting the study. Other literature has also found the inclusion of this information within recruitment ads to be useful in recruiting Black women (Kennedy et al., 2017). Overall, thoughtful consideration is needed in how this information is specified within a recruitment ad, especially for people of color. If this information is not provided, it can limit recruitment and increase participant drop-out rates (McDougall, Holston, & Wilke, 2001). As such, not only should the language of the ad be simple and concise but should go beyond surface level targeting (including language that mentions the targeted group or pictures of the targeted group). Providing information on how a study will directly help their community is useful, in addition to presenting the study requirements.

Racial concordance has been noted to influence the recruitment and retention of Black women in research studies; however, little research has indicated age concordance and representation through professional roles as imagery that could deter Black women from research participation. The sub-category “representation” was noted across all categories and highlights an important factor to consider when creating recruitment ads targeting Black women. Participants reported that racial concordance is needed between the images presented in a recruitment ad and the target audience, such that images of Black women should be shown within recruitment ads in order to appeal to Black women. This finding has also been noted in previous studies (Duerksen et al., 2005; Hazell & Clarke, 2008). However, representation of Black women within recruitment ads must extend beyond racial concordance. Findings show Black women should be represented in all roles within the ad (i.e., patient, doctor, health care worker, client), and by age. The age of women displayed in an ad can dictate which age group of women are likely to participate and can influence which women assume they would be eligible for a study. For instance, Kennedy et al. (2017) created print flyers, copy-tested with a sample of aging Black women, and found that including a stock photo of an attractive, smiling Black woman around age 50, the statement: “We want to hear from you,” the university logo, bulleted “who, what, when and where” study information and local phone numbers helped improve recruitment efforts among this group. More consideration is needed regarding how Black women

are portrayed in recruitment ads, and the roles in which Black women are represented. This could help increase Black women's interest and motivation to participate.

This study contributes to the literature by describing factors that may expand on current recruitment strategies geared towards Black women. However, it is not without limitations. The study had a small sample size (n=10) and only included Black women who lived in Houston, Texas. As such, findings cannot be generalized to the broader population. Second, all data were collected by the researcher and may be subject to social desirability bias, especially if the researcher was seen to be in a position of power. Despite these limitations, the current study was able to obtain detailed information to guide the creation of recruitment ads used in an online research study for Black women. Study findings also provide a new aspect of racial concordance that has not been vastly found in other literature.

### **Conclusion**

The current study extends the existing literature by describing aspects of recruitment ads that appeal to Black women and provides considerations for future research. Systematic investigations of culturally targeted recruitment ads are needed to expand our understanding of which aspects of an ad can improve recruitment efforts among Black women, such as the ad design, color schemes, text, ad content, and location ads are placed. Future studies should also consider using a social marketing approach to elucidate factors influencing the participation of Black women in health-related research studies as related to recruitment ads.

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## **CHAPTER 4**

### **Factors Associated with Likelihood to Use PrEP and Potential Future PrEP Use Among A Sample of HIV-Negative Cisgender Black Women**

#### **Abstract**

Significant racial and regional disparities are associated with HIV incidence rates among Black women, particularly of those who live in the South. PrEP is a woman-controlled HIV prevention strategy that can combat high rates of HIV and be used without the need to negotiate with a sexual partner. Although Black women are at the highest risk for HIV acquisition, they have the lowest rates of PrEP uptake in the U.S. Given the disproportionate burden of HIV among Black women in the South, the current cross-sectional study aimed to identify population characteristics and health behaviors associated with general likelihood to use PrEP and planning to use PrEP in the next 3 months among a sample of at-risk HIV-negative cisgender Black women who live in Texas. Findings from binomial logistic regression found a positive association between likelihood to use PrEP and perceived worry about acquiring HIV (OR[95% CI]= 2.26 [1.40 – 3.92]) and interest in learning more about PrEP (OR[95% CI]= 2.81 [1.56 – 5.74]). For future PrEP use, there was a negative association with relationship status (OR[95% CI]= 0.26 [0.08 – 0.76]) and a positive association with likelihood to use PrEP (OR[95% CI]= 2.81 [1.56 – 5.74]). Both outcome variables (likelihood to use PrEP and future PrEP use) were associated with anticipated PrEP stigma. Findings extend current PrEP-related literature about PrEP uptake and highlights areas for future research.

**Key words:** PrEP, pre-exposure prophylaxis, Black women, cisgender, HIV prevention, PrEP uptake, PrEP stigma

## Introduction

Benefits of early diagnosis, linkage to care, and viral suppression in reducing HIV transmission are well known (Centers for Disease Control and Prevention, 2017a) and have been effective in decreasing HIV incidence rates among Black women. However, unlike other prevention methods, pre-exposure prophylaxis (PrEP) is the first highly effective HIV prevention strategy available to women. Prior to the introduction of biomedical HIV prevention strategies like PrEP, it was believed that HIV was highly preventable through consistent use of condoms. While this is still true, condoms are limited in their practicality as their use is dependent upon the cooperation and often negotiation with, a sexual partner(s). PrEP is a woman-controlled strategy that can be used without the need to negotiate with a sexual partner and empower women to be autonomous about their sexual health and HIV prevention options. PrEP may be especially useful for women who may lack motivation, confidence, or partner support to engage in conversations about condom use and/or safer sex practices with a sexual partner(s).

It is well documented that PrEP is not equitably utilized in the U.S. among all at-risk groups, particularly Black women (Chandler et al., 2022; Hirschhorn et al., 2020; Huang, 2018; Kamitani et al., 2020; A. J. Siegler et al., 2018; Sullivan et al., 2020). Although research suggests that Black women have higher intentions to use PrEP compared to other racial groups of women (Bond & Gunn, 2016; Calabrese et al., 2018; Calabrese et al., 2019; Garfinkel et al., 2017; Kwakwa et al., 2018; Sales et al., 2019; Tekeste et al., 2018), this population remains underrepresented among PrEP users (Kamitani et al., 2020). Kamitani et al. (2020) conducted a meta-analysis to assess trends in PrEP use and PrEP-use disparities among key populations and geographic areas in the U.S. The studies examined were published between 2004 – 2017. The authors identified only four studies that focused on women, of which only one study reported PrEP use, and this was low at 2.4%. Additionally, of the 95 studies examined in this meta-analysis, no study focused on PrEP use among Black women (Kamitani et al., 2020).

The reason for lack of PrEP use among Black women may be attributed to the intersection of various factors, including lack of information, age, medical mistrust, cost, health insurance status, HIV stigma, stigma associated with PrEP use, physician input, ease of accessing PrEP services, individual HIV risk perception, concerns about side effects, and not having convenient PrEP providing locations near their homes (Aaron et al., 2018; Auerbach JD, 2012; Auerbach et al., 2015; Bond, Gunn, Williams, & Leonard, 2022; Bond & Gunn, 2016;

Goparaju et al., 2015; Sheth, Rolle, & Gandhi, 2016; Smith., Toledo, Smith, Adams, & Rothenberg, 2012; Teitelman et al., 2020). As marketing around PrEP has focused on MSM and transgender populations, there may be high rates of misinformation regarding PrEP, stigma about PrEP, and lack of PrEP awareness among Black cisgender women (Chandler et al., 2020; Hill, Patel, Haughton, & Blackstock, 2018). Prior research has also indicated having unreliable or inadequate transportation as a structural-level barrier to PrEP uptake among Black women (Nydegger, Dickson-Gomez, & Ko Ko, 2021; Ogunbajo et al., 2021; Ojikutu et al., 2019; Siegler, Bratcher, & Weiss, 2019). While these findings are noteworthy, few of these research studies specify if or how these barriers are related to Black women who live in the South, which may be different compared to Black women who live in other U.S. regions (Kamitani et al., 2020).

Research estimates that HIV acquisition rates will reduce as the number of persons initiating and consistently taking PrEP increases (Collier et al., 2017). However, this estimate is only accurate if those who are at high risk of acquiring HIV are: 1) knowledgeable about PrEP, 2) have a desire to use PrEP, 3) are considered PrEP eligible, and 4) are taking actions toward starting and remaining adherent to PrEP use guidelines. Given the low rate of PrEP uptake among Black women, identifying factors related to Black women's likelihood to use PrEP (in general) and plan to use PrEP future (i.e., next 3 months) is warranted. Therefore, this cross-sectional study aimed to identify population characteristics and health behaviors associated with one's likelihood to use PrEP and future PrEP use among a sample of at-risk HIV-negative cisgender Black women currently residing in Texas.

## **Methods**

### *Eligibility Criteria and Study Participants*

Women were recruited from three cities in Texas, where the HIV incidence rate in 2019 was 18.9 per 100,000 (Centers for Disease Control and Prevention, 2021), and Black women living in this state represent the second highest racial group diagnosed with HIV among women (AIDSVu, 2020; Texas Department of State Health Services, 2018). These three cities—Houston, in Harris County, Dallas in Dallas County, and San Antonio in Bexar County—are the three most populated cities in Texas and also have the most populated counties with the highest HIV and AIDS diagnoses in Texas (Centers for Disease Control and Prevention, 2018b, 2021b; Texas Department of State Health Services, 2018). Despite these statistics, few research studies

are conducted with Black women in this state compared to other states in the South. As such, the current study aimed to recruit Black women who lived in Houston, San Antonio, or Dallas, Texas.

To be eligible, participants had to: (1) be 18 years of age and older; (2) self-identify as cisgender; (3) self-report as Black (i.e., African American, Haitian American, Caribbean American, etc.); (4) self-report having an HIV-negative or an unknown serostatus; (5) live in or near (within 25 miles) Houston, San Antonio, or Dallas, Texas; (6) engaged in at least one HIV risk behavior in the past 6 months (i.e., unprotected vaginal and/or anal sex with male partner, participated in injection drug use, had sex in exchange for something of value, or had been diagnosed with a sexually transmitted disease [STD]); (7) be fluent in English; and (8) consent to participate in the study.

#### *Recruitment and Study Procedures*

Women were recruited (December 2020 – January 2022) from three cities in Texas using online and print flyers that were created from a focus group study (see Chapter 3). Online ads were placed on social networking websites (e.g., Facebook and Instagram), and physical ads were placed in select locations (coffee shops, restaurants, grocery stores, and gyms) that Black women frequent. Snowball sampling also was used to recruit women into the study.

Individuals who were interested in participating in the study clicked the link to the survey housed in Qualtrics, a HIPAA-compliant survey program (Qualtrics, Provo, UT). Upon reaching the site, participants were provided detailed information about the study (i.e., study purpose, study participation requirements, incentives, privacy and confidentiality, potential risks and benefits of participation) and asked to provide their consent to participate. Those who provided consent to participate were then screened for eligibility. An overarching goal of this study was to increase PrEP awareness among Black women. As such, individuals who were not eligible were thanked for their interest in the study and provided information about PrEP (i.e., basic facts concerning dosing, effectiveness, and side effects) and additional PrEP resources (online telemedicine services that connect HIV-negative individuals with PrEP: <https://heymistr.com/afh-sistr>, national PrEP locator: <https://preplocator.org>, and information to get support paying for PrEP: <https://www.gileadadvancingaccess.com>).

Eligible individuals were invited to participate in the study by completing the online survey. The same PrEP information and resources were provided to study participants when they

completed their online survey. The survey included validated measures to assess environmental factors, population characteristics, and health behaviors that affect women's engagement with PrEP. Average survey completion time was 30 minutes. To preserve confidentiality, data were de-identified and stored in a secured location. Approval from the University of Hawai'i at Mānoa's (UHM) Institutional Review Board was obtained prior to the start of this study.

A total of 1607 individuals clicked the link to the online survey. Of the 1607 individuals, 59% (949) did not complete the eligibility screener and 23.0% (366) were ineligible to participate based on the eligibility criteria. Additionally, there were 6 eligible participants who elected not to participate in the study. Of the remaining 286 individuals, 131 were deemed fraudulent as it could not be determined if these individuals were "real" people. All individuals deemed fraudulent were first contacted via phone call and email address. Individuals who had provided a fake email address and fake or inaccurate phone number, did not live in the U.S. (based on latitude/longitude and IP address), completed the survey more than twice using the same phone number and/or email address, and/or completed the survey in less than 10 minutes (average completion time was 30 minutes) were deemed ineligible. The final sample included 155 participants. For the current study, participant data were excluded for those who self-reported being a current or past PrEP user (n=2) or had too much missing data across multiple predictor variables (n=1). The sample for final analysis consisted of 152 at-risk HIV-negative cisgender Black women who lived in Texas, surveyed between December 2020 and January 2022. Each enrolled, eligible, and consenting participant who completed the survey received an incentive worth \$25 USD, via an electronic gift card, as remuneration for taking the survey.

### *Measures*

Questions were chosen for the online survey as they aligned with the integrated framework and were identified as being associated with PrEP engagement and use in the literature. Participants were asked to complete self-report measures assessing background characteristics (e.g., age, transportation, relationship status, etc.), perceived HIV risk, sexual and other risk behaviors (condomless sex, drug use, etc.), PrEP awareness, interest in learning more about PrEP, PrEP stigma, PrEP attitudes (i.e., likelihood to use PrEP), and future PrEP uptake. Before viewing any questions about PrEP, participants were asked if they had ever heard about PrEP, "Before today, have you ever heard of PrEP?" with Yes/No response option. Whether participants reported yes or no, they were presented with a brief description of PrEP, including

its dosing, effectiveness, and side effects. The introductory information about PrEP, as well as the survey domains as they relate to the theoretical framework, and survey questions related to the current study are provided in Appendices B and C.

### **Dependent Variables**

#### ***Likelihood to Use PrEP***

A single item was used to examine likelihood to use PrEP. To capture this variable, participants were asked, “How likely would you be to use PrEP if it would protect you almost all the time (90% effective)?” (Sales & Sheth, 2018). This was followed by the following information, “Guidelines for using PrEP include taking the medication daily, being tested for HIV by your doctor every 3 months, and to use condoms consistently for anal and vaginal sex.” Response options were captured on a 5-point Likert scale ranging from 1=Very unlikely to 5=Very likely, and dichotomized as Very unlikely, unlikely (0) / Neither likely or unlikely, Likely, and Very likely (1).

#### ***Future Plan to Use PrEP***

Future PrEP use was assessed by asking participants to select their level of agreement with the following statement, “Now that I know more about PrEP, I plan to start using PrEP in the next 3 months.” Responses options were captured on a 4-point Likert scale (1=Strongly Disagree to 4=Strongly Agree ) and dichotomized as strongly disagree, disagree (0) / Agree, Strongly agree (1).

### **Predictor Variables**

Primary predictor variables for both outcome variables are described as they align with the integrated theoretical framework (see Figure 1.1).

### **Figure 1.1. Integrated Model (sIMB and AMB)**

#### ***Population Characteristics***

*Predisposing Characteristics* are individual socio-cultural characteristics that exist prior to HIV acquisition. Self-reported sociodemographic variables were included to describe the sample (e.g., age, ethnicity, relationship status) and as variables in the analysis. Age was assessed by asking, “How old are you today?” Responses were captured by self-report on a continuous numeric scale. Ethnicity was assessed by asking, “Are you Hispanic or Latinx” with Yes/No response options. Relationship status was assessed by asking, “Which of the following

best describes your current relationship status?” Responses were dichotomized as “Single” or “In a relationship.”

*Enabling Resources* are the logistics needed to obtain PrEP, and the factors that impede or facilitate PrEP use. To better understand the association between PrEP use and transportation, participants were asked, “What is your main mode of transportation?” Response options were dichotomized as car or other (bike, walking, bus, Uber/Lyft, or other). Having a health care provider was assessed by asking, “Do you have a family planning provider that you go to for your healthcare needs?” with yes/no response options.

*Perceived need* refers to an individual’s actual need for services. All participants included in the current study were considered to be “at-risk” for acquiring HIV based on CDC PrEP guidelines (Centers for Disease Control and Prevention, 2021a). As part of the study eligibility criteria, all participants self-reported engaging in one or more of the following HIV risk behaviors in the past 6 months (prior to starting the survey), which would put them at risk for acquiring HIV and potentially make them PrEP-eligible: unprotected anal or vaginal sex with a male partner, injection drug use, engaged in sex exchange, and/or diagnosed with a sexually transmitted disease [STD] (e.g., Chlamydia, Gonorrhea, Syphilis, Human Papillomavirus [HPV, warts] or Herpes Simplex Virus). As such, there may have been a “need” for PrEP among the study participants, and thus, the service need was PrEP. Self-perceived HIV risk was assessed using two items. The first item asked, “How safe do you think your current behavior is in avoiding HIV and other sexually transmitted diseases?” with response options captured on a Likert-scale from 1=Not safe at all to 5=Very safe. The second item asked, “How much do you worry that you could get HIV?” with response options captured on a Likert-scale from 1=Not at all to 5=A lot.

### ***Health Behavior***

*Motivation* to use PrEP was assessed using measures on PrEP stigma, PrEP willingness, and PrEP interest. To assess anticipated social stigma surrounding PrEP and stereotypical assumptions and disapproval by others that participants expect to encounter if they used PrEP, the 8-item *PrEP Anticipated Stigma Scale* was used (Calabrese et al., 2018). This scale is made up of two subscales, the PrEP-User Stereotypes subscale and the PrEP Disapproval of Others subscale. The *PrEP-User Stereotypes* subscale consists of 5-items used to assess perceived cultural associations with PrEP (i.e., “People would assume I slept around if they knew I took

PrEP”). Response options ranged from 1=Strongly Disagree to 4=Strongly Agree (Cronbach’s  $\alpha = .83$ ). The PrEP Disapproval by Others subscale represents expected judgment by close others for using PrEP, e.g., “My sexual partner(s) would approve of me taking PrEP.” Response options ranged from 4= Strongly Disagree to 1= Strongly Agree but were reverse scored in calculation of this subscale (Cronbach’s  $\alpha = .87$ ). Mean scores were calculated for each subscale, with higher subscale scores indicating stronger perceived PrEP-user stereotypes and greater expected PrEP disapproval by others, respectively. A confirmatory factor analysis (CFA) was performed to further validate these subscales, confirming the 2-factor solution [ $X^2 (19) = 39.032$ , RMSEA = .015, CFI = .98,  $p = .004$ ]. CFA is a multivariate statistical procedure that is used to test how well the measured variables represent the number of constructs (Schreiber, Nora, Stage, Barlow, & King, 2006). Specifically, CFA allows researchers to test the hypothesis that a relationship between the observed variables and their underlying latent construct(s) exists. Further details regarding the CFA is provided in Appendix D.

Participants were also asked to rate their level of interest in learning more about PrEP with response options ranging from 1=Not at all interested to 5= Extremely interested. The dependent variable “Likelihood to use PrEP” was also included as a predictor variable for future PrEP use.

*Behavioral skills* are the skills needed to use PrEP, such as being able to communicate with a provider about PrEP. Comfort discussing PrEP with a provider was assessed by asking participants, “How comfortable would you be talking about PrEP with a healthcare provider?” Response options ranged from 1= Very uncomfortable to 5=Very comfortable.

### ***Data Analyses***

All statistical analyses were conducted using the Statistical software R, version 3.4.1 (The R Foundation) using the stats package. Descriptive statistics (means and standard deviations; frequencies) were calculated to characterize the sample and describe measures of interest. Bivariate analyses (correlation, Chi-square crosstabs) were performed to examine associations between the independent variables and each outcome variable and to determine variable inclusion into each regression model. Due to the small sample size, only factors significant at the  $p < .05$  level from the bivariate analyses were considered for inclusion in each logistic regression model. Additional variables were included into each model a priori based on known associations from the literature (Aaron et al., 2018; Auerbach et al., 2015; Calabrese et

al., 2018; Patel et al., 2019; Sales & Sheth, 2018). Binomial logistic regression was used to examine each outcome. Model fit was examined using the total variance explained by likelihood to use PrEP and future plan to use PrEP from adjusted R-squared values.

## Results

The study sample included 152 at-risk HIV-negative cisgender Black women who lived in Texas. Selected characteristics are provided in Table 4.1. The mean age was 33 years (range 19 – 70), with most respondents being non-Hispanic (n=142, 95.3%). Most women were in a relationship (n=96, 63.2%), had a car as their main mode of transportation (n=126, 83%), self-reported engaging in only one HIV risk factor (n=117, 77.0%), and heard about PrEP prior to participating in the study (n=93, 61.6%).

### Table 4.1 Selected Characteristics of Study Participants

In bivariate analyses, many factors were significantly associated with each outcome variable (Table 4.2, Table 4.3). However, due to high correlation between predictor variables and the small sample size, some factors were removed from regression analyses (e.g., age, health literacy, willingness to use PrEP, perception of benefit of taking PrEP) .

### Table 4.2 Descriptive Statistics of Characteristics of The Study Population and Bivariate Analyses Stratified by Likelihood to Use PrEP

### Table 4.3 Descriptive Statistics of Characteristics of The Study Population and Bivariate Analyses Stratified by Future Plan to Use PrEP

## Likelihood to Use PrEP

The Crude Odds Ratios, 95% confidence interval, and respective p-values for variables included in the regression model for likelihood to use PrEP are provided in Table 4.4. In the binomial logistic regression for the likelihood to use PrEP outcome, there was a positive association with perceived worry about acquiring HIV (OR [95% CI]= 2.26 [1.40 – 3.92]) and interest in learning more about PrEP (OR [95% CI]= 2.81 [1.56 – 5.74]) (Table 4.4, Figure 4.1). With respect to the PrEP Anticipated Stigma scale, only the PrEP Disapproval by Others subscale was included in the model based on bivariate analyses. There was a negative association between PrEP disapproval by others (OR [95% CI]= 0.41 [0.19 – 0.82]) and likelihood to use PrEP.

### Table 4.4 Factors in Binomial Logistic Regression Analysis Associated With Likelihood to Use PrEP

## **Figure 4.1 Factors Associated With Likelihood to Use PrEP Based on Binomial Logistic Regression**

### **Future Plan to Use PrEP**

The Crude Odds Ratios, 95% confidence interval, and respective p-values for PrEP intention are provided in Table 4.5. Findings from the binomial logistic regression identified four variables that were associated with the individual's plan to use PrEP in the next 3 months (i.e., future plan to use PrEP) (Table 4.5, Figure 4.2). There was a negative association between future plan to use PrEP and relationship status (OR [95% CI]= 0.26 [0.08 – 0.76]). Participants in a relationship had less odds to use PrEP in the next 3 months compared to those who were single. There was a positive association between future PrEP use and likelihood to use PrEP (OR [95% CI]= 2.81 [1.56 – 5.74]). Those who were more likely to use PrEP also had greater odds of using PrEP in the next 3 months. Both subscales from the PrEP Anticipated Stigma scale were statistically significant with future PrEP use. There was a positive association between PrEP user stereotypes (OR [95% CI]= 5.41 [2.07 – 17.15]) and a negative association between PrEP disapproval by others (OR [95% CI]= 0.27 [0.08 – 0.80]) with planning to use PrEP in the next 3 months.

### **Table 4.5 Factors In Binomial Logistic Regression Analysis Associated With Future Plan to Use PrEP**

### **Figure 4.2 Factors Associated With Future Plan to Use PrEP Based on Binomial Logistic Regression**

## **Discussion**

The purpose of this cross-sectional study was to identify population characteristics and health behaviors associated with Black women's likelihood to use PrEP and future plan to use PrEP among a sample of at-risk HIV-negative cisgender Black women who live in Texas. Examining factors that affect likelihood to use PrEP and potential PrEP use in the next 3 months may offer insight to contextualize challenges to PrEP uptake among Black women and contribute to the existing body of PrEP-related literature.

### **Factors Associated with Likelihood to Use PrEP**

Findings from the current study identified perceived HIV risk (i.e., worry about getting HIV) and interest in learning more about PrEP as being positively associated with likelihood to use PrEP. Participants with higher scores for perceived risk had greater likelihood to use PrEP.

Compared to other barriers associated with PrEP use, some researchers believe HIV risk perception is one of the strongest predictors of PrEP uptake (Kwakwa et al., 2016; Kwakwa et al., 2018). People who are at the highest risk for HIV infection often misperceive their HIV risk level and do so at similar rates to those who have low risk for HIV infection (Nydegger et al., 2021; Whiteside, Harris, Scanlon, Clarkson, & Duffus, 2011). Moreover, there may also be inconsistency with how Black women view being “at risk.” Increasing knowledge about personal HIV risk among Black women can help correct risk perception and enable Black women to choose HIV prevention methods that are best suited to their lifestyle.

Additionally, participants with higher levels of interest in learning about PrEP were also more likely to use PrEP. For effective prevention strategies like PrEP to be utilized at peak capacity, those who need it must first be aware that it is available. Black women’s awareness and knowledge about PrEP is low (Auerbach et al., 2015; Collier et al., 2017), yet PrEP awareness is a key factor relevant and critical for PrEP uptake. Before participating in the current study, many participants were already aware of PrEP and were provided brief information about oral PrEP within the survey (see Appendix A). The source for which this PrEP information was provided to participants could be one reason for this association between participants’ interest in learning more about PrEP and their likelihood to use PrEP. Specifically, the source in which women learn about PrEP may dictate their likelihood to use PrEP (Chandler et al., 2020). A study among Black college women found that women had more consideration for PrEP use when they were informed of PrEP by a trusted source (Chandler et al., 2022). This finding may indicate a need to not only increase women’s knowledge and understanding of PrEP, but to ensure the source of PrEP information comes from leaders within the community. Consideration is also needed for how Black women understand PrEP as it relates to their sexual health.

### **Factors Associated with Future Plan to Use PrEP**

Findings from the current study indicate that those with greater likelihood to use PrEP also had greater odds of planning to use PrEP in the next 3 months. It is not surprising that one’s likelihood to use PrEP was positively associated with planning to use PrEP in the future. However, theoretical PrEP use is different from actual PrEP uptake. While this finding is valid, it is unclear whether planning to use PrEP in the next 3 months leads to PrEP uptake among Black women. Relatedly, research on intention and willingness to use PrEP indicate that theoretical PrEP use is notably different from real-world PrEP uptake (Bien, Patel, Blackstock, & Felsen,

2017; Liu et al., 2016; Mitchell & Stephenson, 2015; Montgomery et al., 2016; Rendina, Whitfield, Grov, Starks, & Parsons, 2017; Volk et al., 2015; Zalazar et al., 2016). Sales and Sheth (2018) reported findings on PrEP indication (i.e., individuals who are HIV-negative and PrEP eligible) and interest among 560 young Black women in the South. Black women who were sexually active showed multiple indications for PrEP use, with many of these women reporting they were likely or very likely to use PrEP if it were available to them (Sales & Sheth, 2018). Similar findings were identified in other research examining PrEP intention among women, where Black women had higher intention to use PrEP when compared to women of other racial groups (Bond & Gunn, 2016; Calabrese et al., 2018; Calabrese et al., 2019; Garfinkel et al., 2017; Kwakwa et al., 2018; Sales et al., 2019; Tekeste et al., 2018). However, it is unclear whether Black women in these samples started using PrEP. More research is needed to determine whether one's future plan to use PrEP translates to actual PrEP uptake among Black women in the South.

Results from the current study also indicate that participants who were in a relationship had less odds to use PrEP in the next 3 months compared to those who were single. Research notes that most HIV transmission among Black women takes place within the context of heterosexual relationships via heterosexual contact (i.e., sex with a male counterpart) (Centers for Disease Control and Prevention, 2019d). However, women may view being in a relationship as protective against HIV and other sexually transmitted infections. Those who are not single and believe the relationship to be monogamous and trustworthy may not see the need to use PrEP and thus may not plan to use PrEP in the near future. On the other hand, women who are single may perceive themselves to be at greater risk for acquiring HIV due to having multiple sexual partners and/or inconsistent condom use and thus may consider using PrEP in the next 3 months. This finding denotes the importance of considering Black women's relationship status, and the context of those relationships, when considering PrEP messaging and promotion towards Black women. Among heterosexual couples, relationship dynamics and gender norms can play a role in how couples interact with one another and across various domains, including HIV prevention (i.e., HIV testing, treatment adherence, decisions to use PrEP). As such, behavioral health interventions that include PrEP should account for various types of intimate or casual sexual relationships Black women may have while also providing culturally congruent sexual health information for Black women.

## **PrEP Anticipated Stigma**

In the current study, PrEP anticipated stigma was statistically significant with both outcome variables. Participants with greater expected PrEP disapproval by others had less likelihood to use PrEP, as well as less odds to use PrEP in the next 3 months (i.e., future PrEP use). There was also a positive association between PrEP-user stereotypes and planning to use PrEP in the future. These results are consistent with prior research about anticipated PrEP stigma (Calabrese et al., 2018; Chittamuru et al., 2020; Teitelman et al., 2020). However, it should be noted that PrEP stigma has been identified as a barrier to PrEP uptake among women across various studies (Chandler et al., 2022; Chandler et al., 2020; Dale, 2020; Hill et al., 2018; Hirschhorn et al., 2020), yet PrEP anticipated stigma among Black women is understudied. As such, there may be different kinds of stereotypes that work to impact Black women's future plan to use PrEP outside of perceived stereotypes about being a PrEP user and expectations of disapproval of PrEP use by others. For instance, some Black individuals do not trust the U.S. healthcare system and have deeply held conspiracy beliefs and stereotypes regarding HIV/AIDS (Bogart, Wagner, Galvan, & Banks, 2010). As such, it is not surprising that similar beliefs and stereotypes may be held about PrEP as an HIV prevention strategy by these individuals. Additionally, the interplay between PrEP stigma and misconceptions about PrEP may discourage informative discussions that can increase PrEP knowledge, likelihood to use PrEP, and plans to use PrEP in the near future among HIV at-risk individuals (Smith. et al., 2012). The role of PrEP stigma as it relates to PrEP use among Black women is largely unknown due to limited PrEP use by Black women. Research is needed to better understand if other variations of PrEP stigma impact Black women's likelihood to use PrEP and potential plans to use PrEP in the future. Future research should aim to explore multiple stigma dimensions (Haire, 2015; Major, Dovidio, & Link, 2018; Mustanski et al., 2018) and their combined effects on factors associated with potential PrEP uptake among Black women.

This study had strengths and limitations. One major strength of this study is the use of an integrated theoretical model to examine aspects of the personal characteristics and health behaviors associated with factors related to PrEP use among Black women at risk for HIV infection. Findings also extend the body of knowledge for Black women at risk for HIV and contribute to future studies by providing insight on the utility of an integrated conceptual model. As such, results from this study may help improve intervention development for Black women in

relation to PrEP use. Another strength includes the examination of a validated scale to examine PrEP anticipated stigma among a sample of Black cisgender women. These results expand current literature about types of stigmas that may deter PrEP uptake among Black women. Despite these strengths, this study is not without limitations.

First, recruitment for this research study took place during a major pandemic (COVID-19). Thus, recruiting women to participate in this study proved challenging and led to a small sample size (N=155). Also, the sample consisted of adult HIV-negative cisgender Black who were living in three cities in Texas. Thus, these the results may not be generalizable to rural areas and other states. Additionally, all data were obtained via self-report and may be subject to social desirability bias, inaccuracies, and reporting bias which limit external validity. The study findings are based on cross-sectional data and cannot be used to make causal inferences on women's likelihood to use PrEP or their plan to use PrEP in the next 3 months. Given this sample consisted of non-PrEP users, a longitudinal study would be helpful to understand whether likelihood to use PrEP or potential future PrEP use translates to actual PrEP uptake. Overall, these research findings may help inform the integration of PrEP into current HIV prevention interventions and programs by highlighting factors associated with likelihood to use PrEP and future plan to use PrEP among a sample of Black cisgender women living in the South.

### **Conclusion**

This study identified variables associated with likelihood to use PrEP and potential PrEP use in the next 3 months (i.e., future plan to use PrEP) within a sample of at-risk HIV-negative cisgender Black women in Texas. Study findings contribute to future research by providing information on the utility of an integrated conceptual model created to provide information regarding factors related to PrEP engagement and uptake among Black women.

### **Acknowledgements**

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**Table 4.1 Selected Characteristics of Study Participants (N=152)**

<b>Participant Characteristics</b>	<b>N(%)</b>
<b>Ethnicity</b>	
Non-Hispanic	142 (93.4)
Hispanic	7 (4.6)
Missing	3 (2.0)
<b>Relationship status</b>	
Single	56 (36.8)
In a relationship	96 (63.2)
<b>Transportation</b>	
Other	26 (17.1)
Car	126 (83.0)
<b>Heard of PrEP prior to study participation</b>	
Yes	93 (61.2)
No	58 (38.2)
Missing	1 (0.6)
<b>Engagement in HIV risk behaviors</b>	
>1 risk factor	35 (23.0)
1 risk factor	117 (77.0)
	<b>Mean (SD)</b>
<b>Age</b>	33 (10.7)

**Table 4.2 Descriptive Statistics of Characteristics of The Study Population and Bivariate Analyses Stratified by Likelihood to Use PrEP (N=152)**

	Very unlikely/Unlikely to use PrEP (N=81)	Likely/Very likely to use PrEP (N=66)	Overall (N=152)	$X^2$	$p$
<b>Ethnicity<sup>a</sup></b>					
Non-Hispanic <sup>b</sup>	79 (97.5%)	58 (87.9%)	142 (93.4%)		
Hispanic	2 (2.5%)	5 (7.6%)	7 (4.6%)	1.261	0.241
Missing	0 (0%)	3 (4.5%)	3 (2.0%)		
<b>Relationship status</b>					
Single <sup>b</sup>	19 (23.5%)	36 (54.5%)	56 (36.8%)	13.712	0.000
In a relationship	62 (76.5%)	30 (45.5%)	96 (63.2%)		
<b>Transportation</b>					
Other <sup>b</sup>	8 (9.9%)	17 (25.8%)	26 (17.1%)	5.422	0.020
Car	73 (90.1%)	49 (74.2%)	126 (82.9%)		
<b>Worry about getting HIV</b>					
Mean (SD)	1.75 (0.799)	2.79 (1.06)	2.18 (1.06)	38.127	0.000
Median [Min, Max]	2.00 [1.00, 5.00]	3.00 [1.00, 5.00]	2.00 [1.00, 5.00]		
<b>Interest in learning more about PrEP</b>					
Mean (SD)	2.10 (1.02)	3.21 (1.18)	2.59 (1.22)		
Median [Min, Max]	2.00 [1.00, 5.00]	3.00 [1.00, 5.00]	3.00 [1.00, 5.00]	31.756	0.000
Missing	2 (2.5%)	0 (0%)	3 (2.0%)		
<b>Comfort discussing PrEP with a provider</b>					
Mean (SD)	4.12 (0.886)	4.55 (0.748)	4.32 (0.844)		
Median [Min, Max]	4.00 [2.00, 5.00]	5.00 [2.00, 5.00]	5.00 [2.00, 5.00]	10.945	0.011
Missing	0 (0%)	0 (0%)	1 (0.7%)		
<b>PrEP Disapproval by Others</b>					
Mean (SD)	2.63 (0.692)	2.10 (0.554)	2.40 (0.691)		
Median [Min, Max]	2.67 [1.00, 4.00]	2.00 [1.00, 4.00]	2.33 [1.00, 4.00]	32.394	0.000
Missing	1 (1.2%)	0 (0%)	2 (1.3%)		
<b>PrEP User Stereotypes<sup>a</sup></b>					

	<b>Very unlikely/Unlikely to use PrEP (N=81)</b>	<b>Likely/Very likely to use PrEP (N=66)</b>	<b>Overall (N=152)</b>	<b><math>X^2</math></b>	<b><i>p</i></b>
Mean (SD)	2.43 (0.642)	2.32 (0.660)	2.38 (0.643)	17.854	0.186
Median [Min, Max]	2.40 [1.00, 3.80]	2.20 [1.00, 3.80]	2.40 [1.00, 3.80]		
Missing	1 (1.2%)	1 (1.5%)	3 (2.0%)		

<sup>a</sup>Variables included based on the literature

<sup>b</sup>Referent

Percentages represent column percentages.

HIV: human immunodeficiency virus; PrEP: pre-exposure prophylaxis; STI: sexually transmitted infection

**Table 4.3 Descriptive Statistics of Characteristics of The Study Population and Bivariate Analyses Stratified by Future Plan to Use PrEP (N=152)**

	No intention (N=114)	Intention (N=36)	Overall (N=152)	X <sup>2</sup>	P-value
<b>Ethnicity<sup>a</sup></b>					
Non-Hispanic <sup>b</sup>	109 (95.6%)	31 (86.1%)	142 (93.4%)	2.779	0.056
Hispanic	3 (2.6%)	4 (11.1%)	7 (4.6%)		
Missing	2 (1.8%)	1 (2.8%)	3 (2.0%)		
<b>Relationship status</b>					
Single <sup>b</sup>	31 (27.2%)	24 (66.7%)	56 (36.8%)	30.218	0.000
In a relationship	83 (72.8%)	12 (33.3%)	96 (63.2%)		
<b>Transportation</b>					
Other <sup>b</sup>	13 (11.4%)	12 (33.3%)	26 (17.1%)	10.942	0.013
Car	101 (88.6%)	24 (66.7%)	126 (82.9%)		
<b>Engagement in HIV risk behaviors</b>					
>1 risk factor <sup>b</sup>	21 (18.4%)	14 (38.9%)	35 (23.0%)	5.314	0.022
1 risk factor	93 (81.6%)	22 (61.1%)	117 (77.0%)		
<b>Perceived behavioral risk for HIV/STIs</b>					
Mean (SD)	4.29 (0.929)	3.56 (0.809)	4.12 (0.949)	27.845	0.000
Median [Min, Max]	5.00 [1.00, 5.00]	4.00 [2.00, 5.00]	4.00 [1.00, 5.00]		
<b>Worry about getting HIV</b>					
Mean (SD)	1.99 (1.00)	2.83 (1.00)	2.18 (1.06)	25.376	0.000
Median [Min, Max]	2.00 [1.00, 5.00]	3.00 [1.00, 5.00]	2.00 [1.00, 5.00]		
<b>Likelihood to use PrEP</b>					
Mean (SD)	2.85 (1.22)	4.25 (0.554)	3.18 (1.25)	47.340	0.000
Median [Min, Max]	3.00 [1.00, 5.00]	4.00 [3.00, 5.00]	3.00 [1.00, 5.00]		
Missing	4 (3.5%)	0 (0%)	5 (3.3%)		
<b>Interest in learning more about PrEP</b>					
Mean (SD)	2.19 (1.01)	3.86 (0.931)	2.59 (1.22)	64.977	0.000
Median [Min, Max]	2.00 [1.00, 5.00]	4.00 [1.00, 5.00]	3.00 [1.00, 5.00]		

	<b>No intention (N=114)</b>	<b>Intention (N=36)</b>	<b>Overall (N=152)</b>	<b>X<sup>2</sup></b>	<b>P-value</b>
Missing	1 (0.9%)	0 (0%)	3 (2.0%)		
<b>Comfort discussing PrEP with a provider</b>					
Mean (SD)	4.21 (0.887)	4.69 (0.525)	4.32 (0.844)		
Median [Min, Max]	4.00 [2.00, 5.00]	5.00 [3.00, 5.00]	5.00 [2.00, 5.00]	9.298	0.037
Missing	0 (0%)	0 (0%)	1 (0.7%)		
<b>PrEP Disapproval by Others</b>					
Mean (SD)	2.51 (0.699)	2.04 (0.533)	2.40 (0.691)		
Median [Min, Max]	2.33 [1.00, 4.00]	2.00 [1.00, 4.00]	2.33 [1.00, 4.00]	19.978	0.006
Missing	1 (0.9%)	0 (0%)	2 (1.3%)		
<b>PrEP User Stereotypes<sup>a</sup></b>					
Mean (SD)	2.33 (0.616)	2.51 (0.716)	2.38 (0.643)		
Median [Min, Max]	2.40 [1.00, 3.60]	2.50 [1.00, 3.80]	2.40 [1.00, 3.80]	18.643	0.207
Missing	2 (1.8%)	0 (0%)	3 (2.0%)		

*Notes.*

<sup>a</sup>Variables included based on the literature.

<sup>b</sup>Referent

Percentages represent column percentages.

HIV: human immunodeficiency virus; PrEP: pre-exposure prophylaxis; STI: sexually transmitted infection

**Table 4.4 Factors in Binomial Logistic Regression Analysis Associated With Likelihood to Use PrEP**

	<b>Adjusted OR</b>	<b>95% CI</b>	<b><i>p</i></b>	<b>Unadjusted OR</b>	<b>95% CI</b>	<b><i>p</i></b>
Relationship status [1]	0.53	0.21 – 1.32	0.168	0.26	0.12 – 0.51	<0.001
Worry about getting HIV	2.27	1.40 – 3.92	<b>0.002</b>	3.32	2.18 – 5.39	<0.001
Comfort discussing PrEP with a provider	1.47	0.86 – 2.59	0.166	1.91	1.26 – 3.03	0.004
Interest in learning more about PrEP	2.07	1.39 – 3.19	<b>0.001</b>	2.38	1.72 – 3.39	<0.001
PrEP Disapproval by Others	0.41	0.19 – 0.82	<b>0.015</b>	0.25	0.13 – 0.46	<0.001

*Notes.*

HIV: human immunodeficiency virus; PrEP: pre-exposure prophylaxis; STI: sexually transmitted infection; OR: Odds Ratio; CI: confident interval; *p*: p-value

R<sup>2</sup> Nagelkerke = 0.516

Adjusted OR: N=144

**Table 4.5 Factors In Binomial Logistic Regression Analysis Associated With Future Plan to Use PrEP**

	<b>Adjusted OR</b>	<b>95% CI</b>	<b><i>p</i></b>	<b>Unadjusted OR</b>	<b>95% CI</b>	<b><i>p</i></b>
Relationship status [1]	0.26	0.08 – 0.76	<b>0.016</b>	0.19	0.08 – 0.41	<0.001
Perceived behavioral risk for HIV/STIs	0.87	0.46 – 1.62	0.663	0.46	0.30 – 0.68	<0.001
Worry about getting HIV	1.14	0.62 – 2.11	0.677	2.12	1.47 – 3.18	<0.001
Likelihood to use PrEP	2.81	1.56 – 5.74	<b>0.002</b>	3.93	2.41 – 7.06	<0.001
Comfort discussing PrEP with a provider	1.48	0.75 – 3.18	0.279	2.55	1.42 – 5.14	0.004
PrEP disapproval of others	0.27	0.08 – 0.80	<b>0.026</b>	0.31	0.15 – 0.58	0.001
PrEP user stereotypes	5.41	2.07 – 17.15	<b>0.002</b>	1.56	0.86 – 2.89	0.148

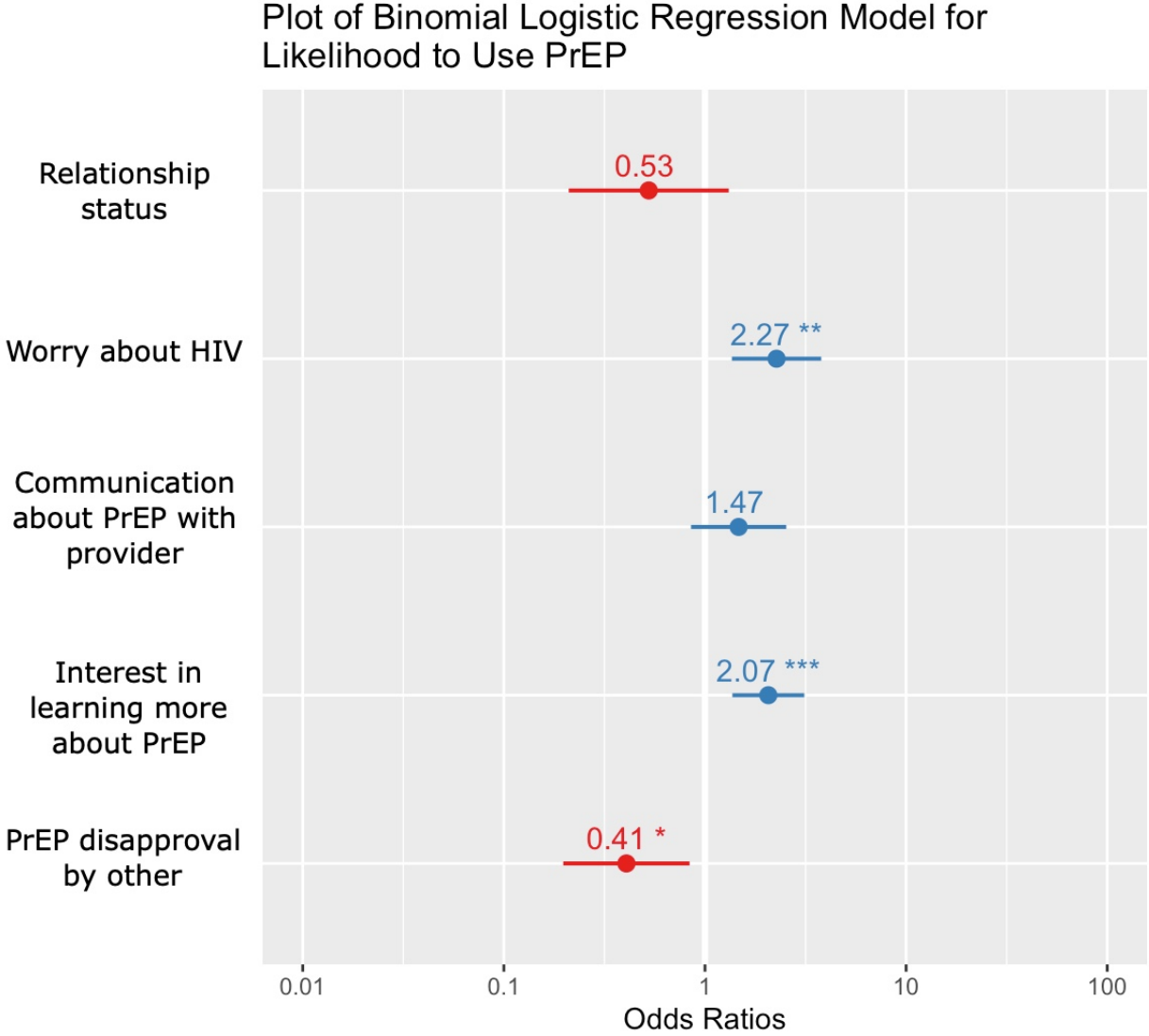
*Notes.*

HIV: human immunodeficiency virus; PrEP: pre-exposure prophylaxis; STI: sexually transmitted infection; OR: Odds Ratio; CI: confident interval; *p*: p-value

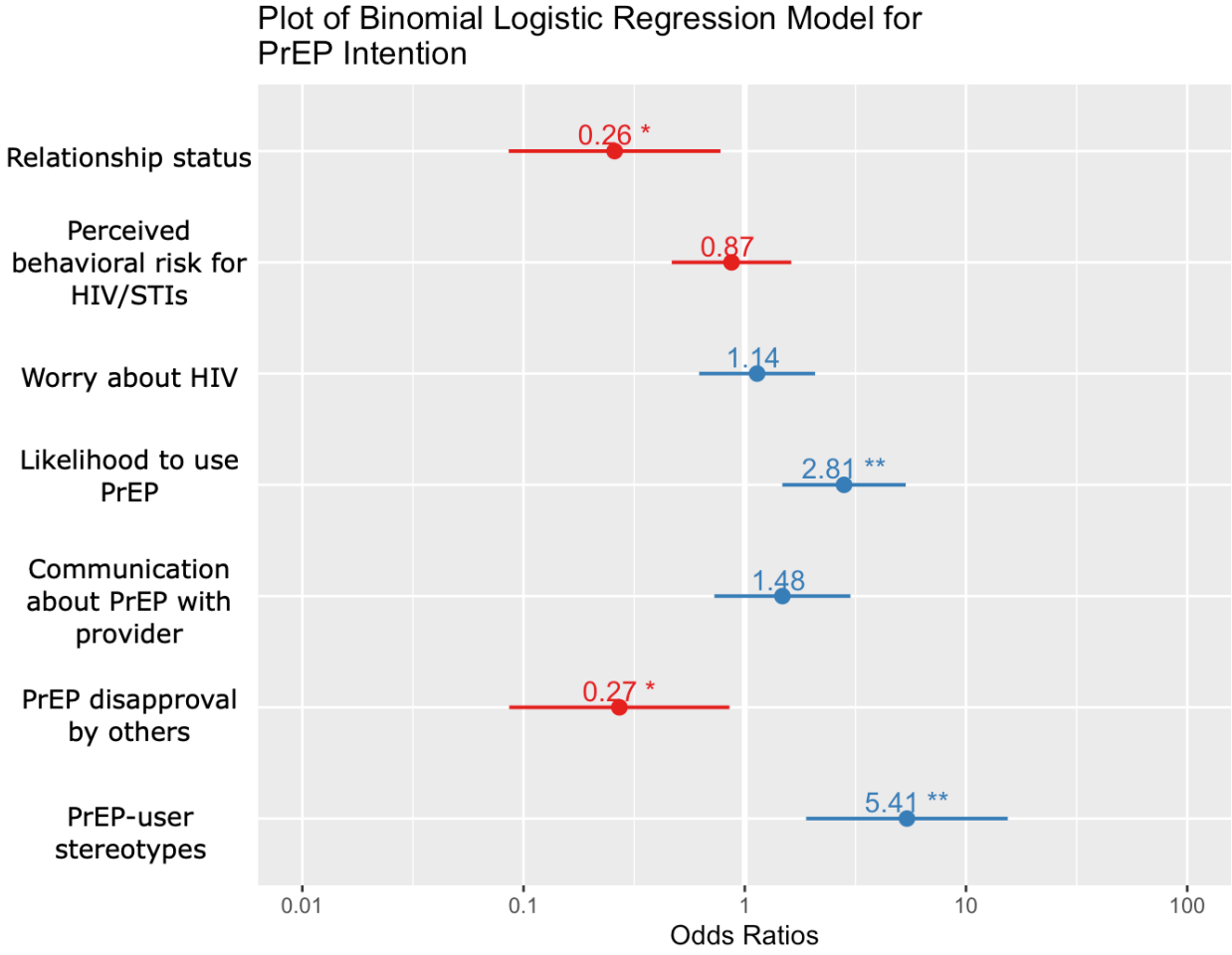
R<sup>2</sup> Nagelkerke = 0.542

Adjusted OR: N=143

**Figure 4.1 Factors Associated With Likelihood to Use PrEP Based on Binomial Logistic Regression**



**Figure 4.2 Factors Associated With Future Plan to Use PrEP Based on Binomial Logistic Regression**



## **CHAPTER 5**

### **CONCLUSION**

#### **Summary of Findings**

This dissertation focused on understanding the current landscape of HIV prevention, aspects of recruitment ads that may best appeal to Black women, and factors associated with PrEP use among Black women. This chapter summarizes the findings from the three dissertation studies and offers suggestions for future research. In the first study, a systematic review was conducted to provide an examination of the status of HIV/AIDS prevention interventions for Black, heterosexual women in the U.S. from 2012-2019. Over half of the interventions were conducted in the Southern region of the U.S., evaluated using a randomized controlled trial, focused on adults, used a group-based intervention delivery, and were behaviorally focused and theoretically driven. Four main observations were noted in this study: 1) there was a lack of interventions that included adolescent females; 2) intervention developed for older women (>45 years old) are uncommon and lacking, 3) no interventions were designed for Black women and their sexual or romantic partner(s), and 4) no effective biomedical prevention strategies were integrated into any of the HIV prevention interventions for Black women.

The second study aimed to highlight factors that may expand on current recruitment and retention strategies for Black women by solicited feedback from Black women using focus groups. The purpose of this study was to examine Black women's general likes and dislikes about women-focused ads, and their preferences for ad content and ad locations to gain the attention of Black women. Findings from the manifest content analysis indicated that racial concordance is needed between the images presented in a recruitment ad and the target audience, such that images of Black women should be shown within recruitment ads to appeal to Black women. These findings have been validated across multiple studies. However, unlike prior research, study findings indicated Black women should be represented in all roles within the ad (i.e., patient, doctor, health care worker, client), and by age.

The third study aimed to identify population characteristics and health behaviors associated with likelihood to use PrEP and use of PrEP in the next 3 months of survey completion among a sample of at-risk HIV-negative cisgender Black women who live in Texas. Findings from binomial logistic regression found a positive association between likelihood to use PrEP and perceived worry about acquiring HIV (OR [95% CI]= 2.26 [1.40 – 3.92]) and interest

in learning more about PrEP (OR [95% CI]= 2.81 [1.56 – 5.74]). For the second outcome, PrEP use in the next 3 months (i.e., future plan to use PrEP), there was a negative association with relationship status (OR [95% CI]= 0.26 [0.08 – 0.76]) and a positive association with likelihood to use PrEP (OR [95% CI]= 2.81 [1.56 – 5.74]). Both outcome variables were associated with PrEP anticipated stigma. Findings extend current PrEP-related literature about factors associated with likelihood to use PrEP and one’s plan to use PrEP in the near future which can help contextualize challenges to PrEP uptake among Black women.

### **Recommendations for Practice**

Health care providers play an integral role in expanding PrEP uptake to populations disproportionately burdened by HIV. Since awareness of PrEP is limited among Black women, individuals at risk for HIV who are unaware of PrEP must rely on their medical/healthcare providers to initiate or be open to conversations about PrEP. Individuals must also be comfortable discussing their sexual health with a healthcare provider to receive optimal care. As a prescription for PrEP is needed to obtain it, providers are gatekeepers to the delivery of information about PrEP and access to PrEP prescriptions. In the current study, comfort discussing PrEP with a provider was not associated with either outcome variable. However, it is important to note that patient-provider communication can affect PrEP decision-making among women considering PrEP (Jackson et al., 2021). Prior research suggests that engaging in open discussion(s) about PrEP with others can help to garner support for personal PrEP use (Moskowitz et al., 2020), increase PrEP knowledge (Felsher et al., 2021; Mutchler et al., 2015), and likely improve PrEP uptake. More research is needed to determine factors that influence patient-provider discussions about PrEP. As such, it is recommended that health educators implement programs that ease patient-provider communication about PrEP. This could help to better facilitate discussion about PrEP in health care settings, particularly among HIV at-risk individuals who are underrepresented in PrEP uptake. Additionally, as PrEP awareness among Black women is low, more efforts are needed understand the best avenues to increase PrEP awareness among this group, such as peer-to-peer or through PrEP messaging campaigns.

### **Recommendations for Future Research**

Based on the results of these studies, the following recommendations are offered:

1. A follow-up study should be conducted to determine if resulting ads created from the focus groups were beneficial in recruiting Black women into the research study. Questions should

gauge Black women's opinions of the ads to gain a better understanding of what motivates Black women to participate in a research study about HIV prevention and women's sexual health.

2. Researchers should conduct nationwide studies to understand the difference in factors associated with PrEP engagement and uptake among Black women by U.S. regions. As such, this research should aim to include Black women who are non-PrEP users and PrEP users to gain a more insightful understanding of factors that have motivated Black women to use and/or stop using PrEP. This may help pinpoint barriers and facilitators of PrEP use as it relates to Black women across different geographic locations and inform the develop of interventions that can be used nationwide.
3. Researchers should conduct longitudinal studies to examine if Black women who self-report intending to use PrEP in the near future (i.e., next 3 months) actually start PrEP. As stated in Chapter 4, theoretical PrEP use is different from actual PrEP uptake. It is unclear whether PrEP use intention or one's likelihood to use PrEP leads to PrEP use. Further, knowledge of the conditions or context, as well as what factors impact Black women's motivations, intent, and uptake of this prevention strategy is limited. While research posits that Black women have high intentions to use PrEP, positive attitudes, intentions, or even planning to use PrEP may not translate to actual PrEP uptake.
4. Future research should test theoretical models with samples of Black women to provide statistical evidence that the model correctly predicts and explains factors related to PrEP uptake. Several theoretical frameworks have been used to examine factors associated with PrEP use among Black women. While their findings have been novel, there are few frameworks created with Black women in mind. Using theoretical frameworks specifically created for use among Black women may help to better capture and understand Black women's perspective regarding HIV. It may also help to improve our understanding of motivations and intentions to use HIV prevention methods and strategies within this population.

## APPENDIX A. SEMI-STRUCTURED FOCUS GROUP GUIDE

### Focus Group Discussion Guide

#### Consent Process Prior to the Start of Each Focus Group

Review the consent form with all FG participants.

*Thank you for agreeing to participate.*

- *Today I want to learn what words, pictures, and places appeal to YOU for online and print advertisements that are recruiting Black women to participate in a research study.*
- *Everything we talk about will remain confidential. Everyone has agreed to have the FG AUDIO recorded so I can review notes later. These recordings will be transcribed with your names removed. All original recordings will be permanently destroyed, and all data will be anonymous.*
- *You have every right to pass on answering any question(s) and may also withdraw from the study at any time.*
- *Since this is a FG, our conversation is to be kept private and confidential. Do you all agree to keep what we discuss amongst ourselves and not with anyone else? I need a verbal yes, please.*
- *At this time, if there is anyone who did not consent to being video recorded, please disable your web camera now.*
- *If you have any questions now or after the FG, please contact me at [asophus@hawaii.edu](mailto:asophus@hawaii.edu) or [phone number will be provided].*

#### Introduction:

##### 1. Housekeeping

- **Who we are, what we're trying to do, why we asked you to participate?** I am a doctoral student and will be conducting an online study with Black women in the next few months. Because of this, I wanted to know what advertisements would be good to use to attract Black women's interest and potential participation in this online study.
  - *If someone asks what the study is about: HIV prevention efforts*
- **What will be done with this information?** The information you provide today will be used to create these recruitment ads for my online study. You will be helping me create every aspect of these ads, including where they should be placed.

##### *Ground Rules Guidelines*

- I ask that everyone share their own opinion(s) for each question we talk about.

- There are no right or wrong answers.
- You do not have to speak in any order.
- If you are not using your cell phone, then please put your cell phones on silent.
- Does anyone have to use the bathroom? Now would be a good time to do so.
- Does anyone have any questions? (answers).
- OK, let's begin

**Questions for first focus group (start recording):**

**General likes/dislikes**

1. First, I would like you to take a few minutes to think about any advertisements you have seen that were for women, specifically for sexual health. This could have been on T.V., in a magazine, on social media, and so forth. When thinking about these advertisements, I want to know if there was anything you liked or disliked about the ads.

[Give participants a few minutes to think about it before using the first prompt as an example]

Prompts:

For example, for any ads that you have seen, did the color matter to you? Would you prefer to see an ad in black and white or color? Why?

- Color: black or white
- Images / pictures / graphics
- Bullet points or sentences?
- Where to place logo?

**Content**

2. What information would you want to be included in an ad that is recruiting Black women (like you) to be in a research study. (If no answer) For instance, would it be important for you to know if the study offers an incentive or any compensation for your time?

PROMPTS:

How important would it be to you to know...

- How long the study is going to take?
- Credentials of study staff? Picture(s) of study staff? For instance, what university or program is conducting the study
- Privacy that will be in place for the study?
- If the study is online or in person

[make sure to ask this question before moving to the next section]: Is there a certain order you would want information to be provided?

**Location**

3. Okay, great. We are almost done. I would like you to please raise your hand if you have ever seen an advertisement for a research study while out?

**If yes:** Great, can you elaborate on where you saw it?

- What caught your eye about the ad?

- Was it because of where it was placed in [ **insert name of the place the participant said they saw the ad** ]?

**If no:** Okay, so where should advertisements for this study be placed?

- For example, by places, I mean gyms, grocery stores, bars, clubs, and so forth.

Online

- What social media do you use? (friends/social, professional, dating/sex)
- Do your friends also use these social media outlets?

**Specific Placement**

- Where do you think would be the most appropriate place a flyer for a research study about sexual health or HIV prevention?

**Ending:**

Thank you for participating and sharing your thoughts and opinions with me. Your comments will be made anonymous. Before we end, we do have 2 housekeeping things to do quickly.

First, as a thank you, I will email each of you now your \$50 Amazon.com gift card. I would like for you all to check your emails now and provide me with a verbal yes when you have received this email. Please also reply back to the email saying you have received it. Please be sure to treat your incentive like cash.

## **APPENDIX B. INTRODUCTORY TEXT ABOUT PREP**

### **What is PrEP?**

Pre-exposure prophylaxis (or PrEP) is a pill taken once a day that can prevent people from getting HIV if they are exposed to HIV during sex or injection drug use. When taken daily, PrEP is highly effective for preventing HIV by more than 90%.

### **Who should take PrEP?**

PrEP is an option for sexually active adults and people who share needles who want to protect themselves against HIV, and can commit to consistently taking a pill on a daily basis and having regular doctor visits (i.e., getting tested for HIV every 3 months).

### **What else do I need to know about PrEP?**

PrEP does not protect against other sexually transmitted diseases (STDs) or pregnancy, so using effective birth control methods and condoms are still important for the sexual health of individuals taking PrEP to reduce HIV risk.

### **How much is PrEP and how can I obtain PrEP?**

You can obtain PrEP at little to no cost. Most insurance companies cover the cost of PrEP. There are also PrEP financial assistance programs for people who are uninsured. More information on how to obtain PrEP will be provided at the end of this survey.

### **Are there side effects?**

Side effects can include upset stomach and dizziness when first starting PrEP. However, they typically go away after the first few weeks, and most people who take PrEP do not notice any side effects at all.

### **Do I have to tell someone if I am using PrEP?**

No, you are not required to tell others when you are taking PrEP. By taking PrEP you do not put others at risk. You can tell others you are taking PrEP at your discretion.

Remember: PrEP is a daily HIV prevention pill taken by people who are HIV-negative.

**APPENDIX C. THEORETICAL FRAMEWORK DOMAINS, SPECIFIC AREAS, AND VARIABLES USED TO EXAMINE LIKELIHOOD TO USE PREP AND FUTURE PLAN TO USE PREP**

Theoretical Framework Domain	Areas	Variables Used In Study
<b>Population Characteristics</b>		
<i>Predisposing Characteristics</i>	<ul style="list-style-type: none"> <li>• Ethnicity</li> <li>• Relationship status</li> </ul>	<p>Are you Hispanic of Latinx?</p> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul> <p>Which of the following best describes your current relationship status?</p> <ul style="list-style-type: none"> <li>• In a relationship: Married, engaged, or dating 1 person exclusively (i.e., boyfriend)</li> <li>• Single: Single, dating multiple people, no label or relationship</li> </ul>
<i>Enabling Resources</i>	<ul style="list-style-type: none"> <li>• Transportation</li> </ul>	<p>What is your main mode of transportation?</p> <ul style="list-style-type: none"> <li>• Car</li> <li>• Bike</li> <li>• Walking</li> <li>• Bus</li> <li>• Uber / Lyft</li> <li>• Other (please specify)</li> </ul>
<i>Perceived Need</i>	<ul style="list-style-type: none"> <li>• Engagement in HIV risk behaviors</li> <li>• Perceived behavioral risk for HIV/STIs</li> <li>• Worry about getting HIV</li> </ul>	<p>To be eligible to participate in the study, individuals had to have met at least 1 of the HIV-risk factors which indicates HIV at-risk behavior: “In the past 6 months, have you have engaged in any of the following activities (select all that apply)”</p> <ul style="list-style-type: none"> <li>• Unprotected anal or vaginal sex with male partner, injection drug use, engage in sex exchange, diagnosed with a sexually transmitted disease (STD) (e.g., Chlamydia, Gonorrhea, Syphilis, Human Papilloma Virus (HPV, warts) or Herpes Simplex Virus)</li> </ul> <p>How safe do you think your current behavior is in avoiding HIV and other sexually transmitted diseases (Sales and Sheth (2018))</p> <ul style="list-style-type: none"> <li>• Very Safe</li> <li>• Safe</li> <li>• Unsure</li> <li>• Not very safe</li> <li>• Not safe at all</li> </ul> <p>How much do you worry that you could get HIV? (Sales and Sheth (2018))</p> <ul style="list-style-type: none"> <li>• Not at all</li> <li>• Rarely</li> <li>• Sometimes</li> <li>• Often</li> <li>• A lot</li> </ul>
<b>Health Behavior</b>		

<p><i>Motivation</i></p>	<ul style="list-style-type: none"> <li>• PrEP stigma</li> <li>• Likelihood to use PrEP</li> <li>• Interest in learning more about PrEP</li> </ul>	<p><sup>1</sup>PrEP Anticipated Stigma Scale (<i>Calabrese et al. (2018)</i>)</p> <ul style="list-style-type: none"> <li>• PrEP-User Stereotypes (5 items) <ul style="list-style-type: none"> <li>○ People would assume I slept around if they knew I took PrEP</li> </ul> </li> <li>• PrEP Disapproval by Others (3 items) <ul style="list-style-type: none"> <li>○ My sexual partner(s) would approve of me taking PrEP</li> </ul> </li> </ul> <p>How likely would you be to use PrEP if it would protect you almost all the time (90% effective)? Guidelines for using PrEP include taking the medication daily, being tested for HIV by your doctor every 3 months, and to use condoms consistently for anal and vaginal sex.</p> <ul style="list-style-type: none"> <li>• Very Unlikely</li> <li>• Unlikely</li> <li>• Neither likely or unlikely</li> <li>• Likely</li> <li>• Very likely</li> </ul> <p>Please rate your level of interest in learning more about PrEP (<i>Calabrese et al., 2018; Tekeste et al., 2018</i>)</p> <ul style="list-style-type: none"> <li>• Not at all interested</li> <li>• A little bit interested</li> <li>• Somewhat interested</li> <li>• Very interested</li> <li>• Extremely interested</li> </ul>
<p><i>Behavioral skills</i></p>	<ul style="list-style-type: none"> <li>• Comfort discussing PrEP with a provider</li> </ul>	<p><sup>2</sup>How comfortable would you be talking about PrEP with a healthcare provider? (<i>Chinn and McCarthy (2013)</i>)</p> <ul style="list-style-type: none"> <li>• Very comfortable</li> <li>• Somewhat comfortable</li> <li>• Neither comfortable nor uncomfortable</li> <li>• Somewhat uncomfortable</li> <li>• Very uncomfortable</li> </ul>
<b>Outcome</b>		
	<p>Likelihood to use PrEP</p>	<p>How likely would you be to use PrEP if it would protect you almost all the time (90% effective)? Guidelines for using PrEP include taking the medication daily, being tested for HIV by your doctor every 3 months, and to use condoms consistently for anal and vaginal sex.</p> <ul style="list-style-type: none"> <li>• Very Unlikely</li> <li>• Unlikely</li> <li>• Neither likely or unlikely</li> <li>• Likely</li> <li>• Very likely</li> </ul>
	<p>Future plan to use PrEP</p>	<p>How much do you agree with the following statement: Now that I know more about PrEP, I plan to start PrEP in the next 3 months.</p> <ul style="list-style-type: none"> <li>• Strongly Disagree</li> <li>• Disagree</li> <li>• Agree</li> <li>• Strongly Agree</li> </ul>

**APPENDIX D. CONFIRMATORY FACTOR ANALYSIS FOR THE PREP ANTICIPATED STIGMA SCALE**

***PrEP Anticipated Stigma Scale***

Remember: PrEP is a daily HIV prevention pill taken by people who are HIV-negative. Think about what it would be like to take PrEP. Please rate your agreement with the following statements.

**PrEP User Stereotypes**

**pass1:** People would assume I slept around if they knew I took PrEP.

**pass2:** People would think I am a bad person if they knew I took PrEP.

**pass3:** People would assume I am gay if they knew I took PrEP.

**pass4:** People would assume that I was HIV-positive if they knew I took PrEP.

**pass5:** I would feel ashamed to tell other people that I was taking PrEP.

**PrEP Disapproval by Others**

**pass6:** My sexual partner(s) would approve of me taking PrEP.

**pass7:** My family would approve of me taking PrEP.

**pass8:** My friends would approve of me taking PrEP.

*Note:* For the purpose of the CFA the code name pass1, pass2, pass3, pass4, and pass5 were assigned to corresponding statements within the PrEP User Stereotypes subscale. The code names pass6, pass7, and pass8 were assigned to corresponding statements within the PrEP Disapproval by Others subscale. As such, these code names name represent each statement within the PrEP Anticipated Stigma scale and are used in place of the full statement within Figure S1 and Figure S2.

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***PrEP Anticipated Stigma Scale Scoring Instructions***

- For Items 1-5, assign the following values to each response:
  - Strongly Disagree = 1
  - Disagree = 2
  - Agree = 3
  - Strongly Agree = 4
- Reverse score Items 6, 7, and 8 by assigning the following values:
  - Strongly Disagree = 4
  - Disagree = 3
  - Agree = 2
  - Strongly Agree = 1
- Calculate subscale scores by averaging across items:
  - *PrEP-User Stereotypes*: Sum items 1-5 ÷ 5
  - *PrEP Disapproval by Others*: Sum items 6-8 ÷ 3
- Higher subscale scores indicate stronger perceived PrEP-user stereotypes and greater expected PrEP disapproval by others, respectively.

**CFA**

Confirmatory factor analysis was performed to test the goodness of fit of a two-factor model using Statistical software R, version 3.4.1 (The R Foundation) and its libraries (N=148). All indicator variables loaded significantly on the two latent constructs, *PrEP-User Stereotypes* (5 items) and *PrEP Disapproval by Others* (3 items),  $X^2(19) = 39.032, p = .004$ . Goodness of fit were within the acceptable range: The comparative fit index (CFI)( $>.98$ ), and Tucker-Lewis index (TLI)( $>.98$ ) had values greater than .95 and the root mean square error of approximation (RMSEA)(.015) had a value below .05. Table S1 shows a description of each subscale item, and the mean and standard deviation based on the study sample. Table S1 shows Cronbach's alpha for each subscale with upper and lower limits. Figure S1 presents the factor loadings for each subscale. Figure S2 shows factor model for the PrEP Anticipated Stigma scale.

**Table S1. Measures of PrEP Anticipated Stigma**

<b>PrEP Anticipated Stigma Scale</b>	<b>Question Items</b>	<b>M(SD)</b>
<i>PrEP-User Stereotypes(5-items)<sup>a</sup></i>		
	People would assume I slept around if they knew I took PrEP.	2.67 (0.86)
	People would think I am a bad person if they knew I took PrEP.	2.10 (0.82)
	People would assume I am gay if they knew I took PrEP.	2.05 (0.79)
	People would assume that I was HIV-positive if they knew I took PrEP.	2.64 (0.87)
	I would feel ashamed to tell other people that I was taking PrEP.	2.43 (0.85)
<i>PrEP Disapproval by Others (3-items)<sup>b</sup></i>		
	My sexual partner(s) would approve of me taking PrEP.	2.41 (0.81)
	My family would approve of me taking PrEP.	2.51 (0.79)
	My friends would approve of me taking PrEP.	2.25 (0.73)

Notes.

<sup>a</sup> Overall mean = 2.38, standard deviation=0.64

<sup>b</sup> Overall mean = 2.4, standard deviation=0.69

**Table S2. Cronbach's Alpha for PrEP Anticipated Stigma Subscales**

PrEP Anticipated Stigma Scale	$\alpha$	95% confidence boundaries	
		Lower	Upper
<i>PrEP-User Stereotypes</i>	0.83	0.78	0.877
<i>PrEP Disapproval by Others</i>	0.87	0.83	0.91

**Figure S1. Loadings For Subscales**

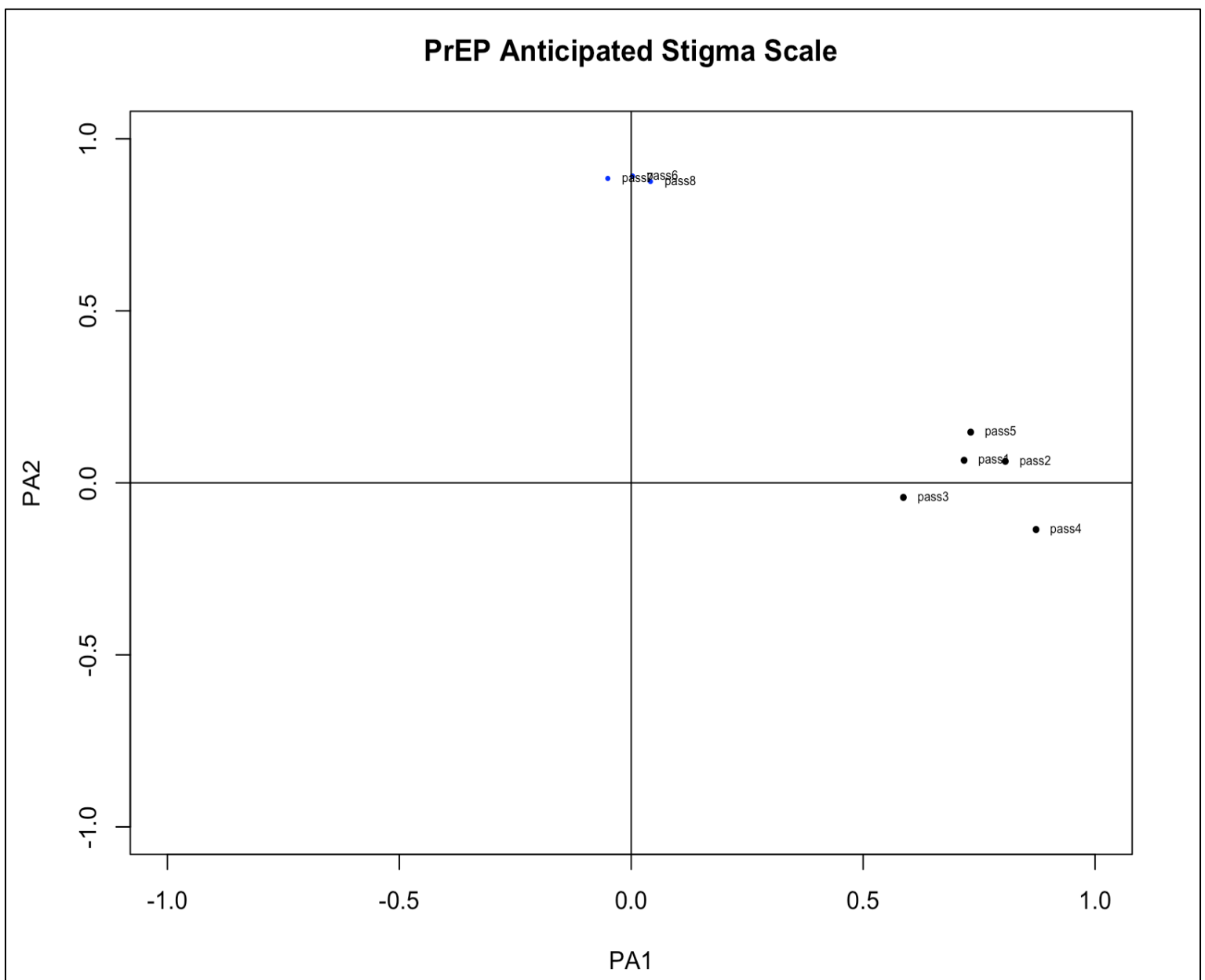
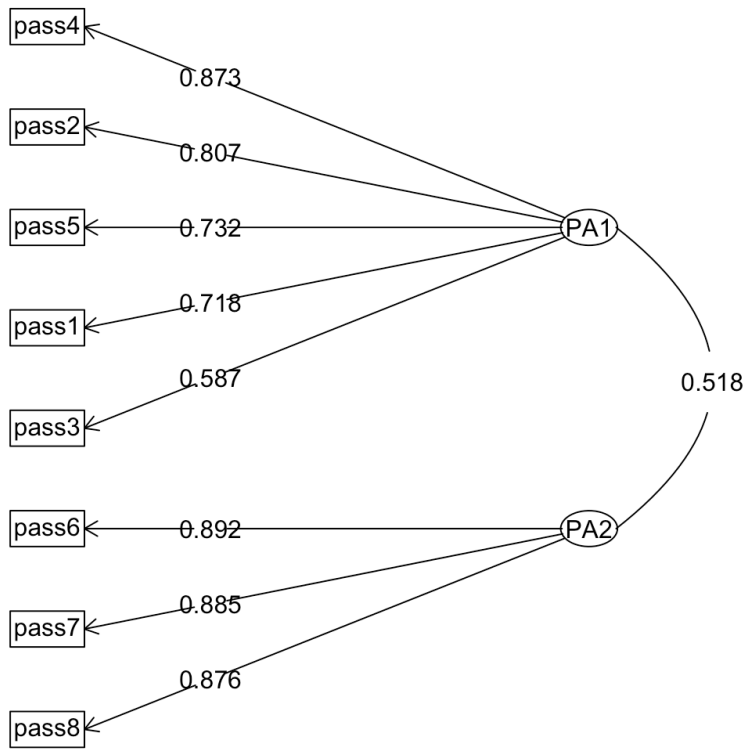


Figure S2. Factor Diagram For PrEP Anticipated Stigma Scale



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