ABSTRACT

Title of Dissertation: A QUALITATIVE EXAMINATION OF THE BARRIERS AND FACILITATORS OF PRE-EXPOSURE PROPHYLAXIS (PrEP) UPTAKE AMONG HETEROSEXUAL HIV SERODISCORDANT COUPLES

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It is estimated that there are 140,000 heterosexual serodiscordant couples in the United States. Given the considerable number of these couples and the high risk of HIV acquisition among non-infected partners, it is important to focus prevention methods on programs and interventions that target transmission of HIV infection among serodiscordant heterosexual couples. Currently, we understand little about factors that influence these couples to use pre-exposure prophylaxis (PrEP). According to the CDC, this population is one of the highest risk groups, therefore, understanding the factors that influence them to use PrEP as a strategy in their HIV prevention regimen is an important step in preventing new HIV cases among this population. This study was a qualitative analysis that explored potential motivators and inhibitors for PrEP among heterosexual HIV serodiscordant couples. Secondary data from 26 qualitative interviews of HIV serodiscordant couples (N = 52 individuals) was examined to determine the factors that influenced the decision to use PrEP. Overall, there were five overarching themes from the Health Belief Model that manifested in all participant interviews. Perceived threat, perceived barriers (concerns about side effects, fear/anxiety about taking medication, indifference about HIV transmission), perceived benefits, cues to action (partner protection, PrEP use as condom replacement, PrEP use due to concerns about condom efficacy), and relational efficacy emerged as the most salient themes that determined whether couples chose to use PrEP as an HIV prevention method. Two constructs from the Theory of Gender and Power, sexual division of power and cathexis also emerged as relevant factors that influenced the decision to use PrEP in these couples. Findings from this study indicate that practitioners need to consider the motivators and barriers to PrEP uptake, and critically examine how power dynamics impact the decision to use PrEP. There is a need for the development of couples-based interventions to encourage PrEP uptake and adherence in mixed status couples.

A QUALITATIVE EXAMINATION OF THE BARRIERS AND FACILITATORS OF PRE-EXPOSURE PROPHYLAXIS (PrEP) UPTAKE AMONG HETEROSEXUAL HIV SERODISCORDANT COUPLES

by

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Dedication

For Journey and Freedom, the true loves of my life.

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Onward.

TABLE OF CONTENTS

Appendices

LIST OF TABLES

LIST OF FIGURES

Chapter I: Introduction

HIV in the United States

According to Centers for Disease Control and Prevention (CDC), there were approximately 1.18 million people over the age of 13 living with HIV in the United States at the end of 2019 (CDC, 2021). In 2019, there were 36,801 new HIV infections. Among those new cases, 41.6% were African American, 28.5% were White, and 24.5% were Hispanic/Latino. Eighty percent of new cases of HIV were among men. Of these cases, 65% were contracted from male-to-male sexual contact, 23% through heterosexual sex, 7% through injection drug use, and 4% through a combination of male-to-male sexual contact and injection drug use. Heterosexual intercourse is the most common mode of transmission among women, accounting for 85% of new cases of HIV in this group. The remaining cases occurred as a result injection drug use (CDC 2021).

There is an emerging body of literature on the transmission of HIV between heterosexual serodiscordant couples, where one partner is living with HIV and the other one is not. Extant literature shows that the risk of HIV transmission among serodiscordant couples is high. One study among 2521 African heterosexual serodiscordant couples, 113 partners (73 men, 40 women) became HIV positive over the course of 3509 person years of follow-up (3.2 new cases per 100 person years) (Baeten, Kahle, Lingappa, 2011). In their meta-analysis of serodiscordant couples, Lasry et al. (2014) found that couples who used no HIV prevention method had a 10 year cumulative probability of HIV transmission of 44%. Couples who used condoms only hapfpd a cumulative probability of HIV transmission of 11% over a 10 year period. Those couples who engaged in anal sex experienced even higher HIV transmission risk. HIV negative males who engaged in insertive anal sex (IAS) with a female partner who is living with HIV had a 71% 10 year cumulative HIV transmission risk. HIV negative females who engaged in receptive anal sex (RAS) with a male partner who is living with HIV had an 89%, 10 year cumulative risk of HIV transmission. Given the high risk of HIV infection among heterosexual serodiscordant couples, there is an urgent need to reduce the risk of HIV transmission between sexual partners in steady partnerships.

HIV Pre-Exposure Prophylaxis (PrEP)

The Food and Drug Administration (FDA) approved the use of a drug called Truvada to reduce HIV infection in high-risk individuals in 2012 (FDA, 2012). Truvada is a combination of two antiretroviral drugs (tenofovir disoproxil and emtricitabine) originally used to treat HIV infection. The primary basis for the approval of PrEP were two large randomized clinical trials that demonstrated safety and efficacy in reducing the incidence of HIV in high-risk populations. The first study, the iPrEx trial, conducted in Peru, Ecuador, South Africa, Brazil, Thailand, and the United States, included 2499 men and transgender women who were HIV negative but demonstrated high sexual risk behavior such as, inconsistent and non-condom use with sex partners either known to be living with HIV or with unknown HIV status, having sex with multiple concurrent partners, and participating in the sex trade. This study resulted in a 42% reduction of HIV infection risk in the intervention arm taking PrEP compared to the placebo control group (Grant, et al., 2010). The second trial, Partners PrEP, was conducted in Kenya and Uganda with 4758 serodiscordant heterosexual couples. In the study, 100 couples became HIV positive. Thirty-six of these infections occurred in the group taking Truvada and 64 occurred in the placebo group, which represents a relative reduction of 44% in incidence in the modified intention-to-treat population (95% confidence interval [CI], 15 to 63; P=0.005). Overall HIV incidence in the placebo group of the Partners PrEP Study was 2 per 100 person-years. PrEP efficacy was 67% (95% confidence interval [CI] 44–81, p<0.001) for TDF and 75% (95% CI 55–87, p<0.001) for Truvada) (Murnane, et al., 2013). It is notable that in 2013 an ancillary study of the Partners PrEP study was conducted to assess efficacy of PrEP when adherence was high. Participants who had <80% adherence received additional counseling and improved adherence to >80%. PrEP efficacy was 100% for those who participated in the ancillary study (Koenig, Lyles, & Smith, 2013). A substudy of the iPrex trial which tracked blood concentrations of PrEP in study participants found that PrEP efficacy was 90% (Anderson, Glidden, Liu, Buchbinder, Lama, Guanira, & McMahan, 2012).

Because most of the burden of new HIV cases in the United States continues to be borne by men who have sex with men (MSM), clinical trials and research projects related to appropriate messaging and treatment adherence of PrEP have been heavily focused on this population. However, because of the demonstrated efficacy of PrEP among MSM, PrEP has emerged as a potentially effective means of preventing HIV infection among other high-risk groups. In May 2014, the CDC officially recommended that “PrEP be considered for all individuals who are HIV-negative and at substantial risk for HIV” (CDC 2014d). According to CDC guidelines, heterosexual persons in serodiscordant relationships are among those who are at substantial risk for HIV transmission.

HIV and PrEP Use Among Heterosexual Serodiscordant Couples

According to the CDC (2015), there are approximately 624,000 heterosexual people at risk for HIV infection consistent with the need for PrEP use. It is estimated that there are 140,000 heterosexual serodiscordant couples in the United States (Lampe, Smith, Anderson, et al., 2011). Given the substantial number of heterosexual serodiscordant couples and the high risk of HIV acquisition among non-infected partners, it is important to focus prevention methods on programs and interventions that target heterosexual transmission of HIV infection among serodiscordant heterosexual couples. Studies have shown that several factors can contribute to reduced HIV transmission among serodiscordant couples (Baeten, et al., 2012; Cohen, et al., 2011; Loutfy, et al., 2013). Consistent condom use is the main recommendation for the prevention of HIV transmission in serodiscordant couples. A meta-analysis of condom effectiveness in heterosexual HIV serodiscordant couples found that HIV risk was lower among couples who used condoms during penetrative intercourse when compared with those who inconsistently used (RR: 0.23, 95% CI: 0.13 – 0.40) or never used (RR: 0.29, 95% CI: 0.20 – 0.43) condoms. When the male partner was living with HIV, this protective effect was slightly higher (RR: 0.31, 95% CI: 0.30 – 0.48; vs. RR: 0.44, 95% CI: 0.24 – 0.80) (Giannou, Tsiara, Nikolopoulos, et al., 2016). Treatment of the partner living with HIV is another important factor given that risk of HIV transmission reduces as viral load goes down and CD4 counts increase. While CD4 counts for people without HIV are between 500 and 1500, transmission risk is highest when the CD4 count of the person living with HIV is less than 200 (Donnell, Baeten, Kiarie, Thomas, et al. 2010). In addition, research has shown that risk of transmission among serodiscordant couples is lowest when the partner living with HIV is virally suppressed, that is he/she has a viral load count of less than 200 copies of HIV per milliliter of blood (CDC, 2018). HIV treatment can decrease

HIV viral loads to undetectable levels and increase the CD4 count of people living with HIV, decreasing the risk of HIV transmission.

PrEP use in serodiscordant couples has the potential to provide another layer of protection for HIV negative persons in serodiscordant relationships. Clinical trials have demonstrated that biologically, PrEP is effective in preventing heterosexual transmission of HIV among both men and women (Baeten, Donnell, et al., 2012; Dumond, Yeh, et al., 2007; Matthews, Baeten, et al., 2010). As of 2017, there have been 5 published randomized clinical trials (RCTs) of PrEP efficacy among heterosexual men and women: The Partners PrEP study (Kenya and Uganda), FemPrEP (Kenya, South Africa, and Tanzania), VOICE (South Africa, Uganda, and Zimbabwe), TDF2 (Botswana), and the West African Safety Study, a trial among high-risk heterosexual women. The Partners PrEP and TDF2 trials showed that PrEP was efficacious in preventing HIV transmission among heterosexual men and women who had high adherence of PrEP (Murnane et al., 2013, Thigpen, et al, 2012). The FemPrEP study, which was conducted with 2120 HIV negative women was discontinued due to low drug adherence rates and lack of significant reduction in HIV acquisition (Corneli et al., 2014). At study visits, the intervention arm participants received counseling (risk reduction, contraceptive use) and free condoms. Despite this, 33 women in the treatment group acquired HIV during the trial and blood tests revealed low levels of PrEP during the infection window indicating low adherence to the regimen. The other two studies also did not demonstrate efficacy of PrEP in HIV prevention among heterosexual persons, primarily due to low medication adherence among their participants.

Since the FDA approval of PrEP for HIV prevention in 2012, PrEP use has increased significantly. Between 2012 and 2016, 98,732 individuals started using PrEP (AIDS Vu, 2016). By the first quarter of 2017, an estimated 120,000 individuals had been prescribed PrEP. Ninety-five percent of these individuals are men. The sexual identity of these men is unknown (Mera, Magnuson, Trevor, et al., 2017). The CDC estimates that there are nearly 1.2 million individuals who meet the criteria for PrEP use in the United States (Smith, Van Handel, Wolitski, et al., 2015). We still have a long way to go in meeting these numbers. Further, PrEP use among heterosexual men and women is still not high enough to address the epidemic need in this population (Siegler, et al., 2018). While the approval of PrEP as a means of reducing HIV infection in high-risk individuals represents a paradigm shift in HIV prevention methods from strictly behavior modification into the biomedical realm, results from recent studies demonstrate that PrEP cannot be implemented as a strictly biomedical prevention strategy. There is a critical need to understand factors that influence the decision to take PrEP among groups at high-risk for HIV infection, including heterosexual serodiscordant couples.

Problem Statement

Currently, we understand little about factors that influence heterosexual serodiscordant couples to use PrEP. According to the CDC, this population is one of the highest risk groups, therefore, understanding the factors that influence heterosexual serodiscordant couples to use PrEP as a strategy in their HIV prevention regimen is an important step in preventing new HIV cases among HIV serodiscordant couples (CDC 2017).

There is a small body of literature on PrEP use among heterosexual serodiscordant couples. Most of these studies have been conducted internationally in African and Asian countries (Haberer, Ngure, Muwonge, Mugo, Katabia, Heffron, et al. 2017; Ngure, Heffron, Curran, Vusha, Ngutu, Mugo, et al., 2016; Pintye, Beima-Sofie, Kimemia, Ngure, Trinidad, Heffron, et al, 2017). These studies indicate that when PrEP adherence is high, protection from HIV transmission is also high. There are only a small number of domestic studies focused on heterosexual serodiscordant couples. These studies have found PrEP acceptability among couples who wish to conceive, want increased awareness of PrEP and its protective properties in order to reduce stigma around their serodiscordant status, and couples who believe that PrEP use could increase feelings of intimacy within their relationships (Bazzi, Leech, Biancarelli, Sullivan, & Drainoni, 2017; Karris, Beckerman, Mehta, Anderson, & Polgreen, 2014; Lampe, Smith, Anderson, Edwards, & Nesheim, 2011). Another study found that women in serodiscordant relationships who were not currently using PrEP viewed PrEP as an added protection from HIV transmission and they were willing to add PrEP to their HIV prevention regimen (Auerbach, et al., 2015). As PrEP uptake in the United States has been relatively slow, other studies have focused on the opportunities and challenges related to increasing PrEP use (Lampe, et al., 2011, McMahon et al., 2014).

In summary, there has not been a vast amount of research on PrEP among heterosexual discordant couples in the United States. Also, current research has centered primarily on safe conception, decreased stigma, and increased intimacy. While this is valuable knowledge, it is important to understand potential barriers and motivators for these couples to use PrEP so that uptake of this proven prevention method can be improved in this population. This study is an examination of the factors that influence couples to use PrEP as an HIV prevention method. It aims to provide further insight into what might motivate couples to use PrEP beyond the desires for safer conception, as this has been a central focus of many of the studies previously conducted both globally and domestically. This insight can be employed to develop strategies to effectively target this population for HIV prevention methods, particularly PrEP.

The Present Study

The present study is a secondary qualitative analysis which seeks to explore potential motivators and inhibitors for PrEP among heterosexual HIV serodiscordant couples. The primary research question that was addressed in this study is: "What factors influence HIV pre-exposure prophylaxis uptake among heterosexual HIV serodiscordant couples?" For the purposes of this study, uptake is defined as the initiation and current use of HIV pre-exposure prophylaxis medication to prevent HIV transmission. To answer this question, twenty-six HIV serodiscordant couples (N = 52 individuals), completed in depth qualitative interviews. The study sample is primarily Black/African American (77%), followed by Hispanic/Latino (17%) and White (6%). In 59% of these couples, the HIV negative partner was currently using PrEP (n=15). In approximately 60% of (n = 16) of these couples, the female partner was living with HIV. Despite the fact that male partners more likely to be the HIV negative partner in this sample, HIV negative female partners were more likely to take PrEP than HIV negative male partners, with 37.5% (n = 7) of males and nearly 82% (n = 8) of females currently taking PrEP. This dissertation examined the factors that influenced the decision to use PrEP or not among the study sample.

Theoretical Frameworks

This study employed two theories to contextualize the experiences of the participants in this study – the Health Belief Model and the Theory of Gender and Power. The Health Belief Model was used to assess and understand the ways that individuals in serodiscordant relationships make the decision to use or not use PrEP. The Theory of Gender and Power was used to better understand the gender-based factors that influence this decision.

Health Belief Model

Developed in the early 1950s by the U.S. Public Health Service, the Health Belief Model posits that if individuals believe they are at risk for a health condition and they believe that the severity of the risk is enough to warrant the action that must be taken to minimize this risk, they will change their behavior (Champion & Skinner, 2008). Individuals must also believe that any adverse effects of behavior change are worth it (i.e., side effects of PrEP drugs) and that they must have self-efficacy – or the belief that they are capable of engaging in the prescribed behavior. The Health Belief Model has six major constructs. As it relates to this study, these six constructs can be described as follows:

1. Perceived susceptibility – This refers to the participants' belief that they are vulnerable to acquiring or transmitting HIV.
2. Perceived severity - This refers to the participants' belief that HIV is a serious condition that one should avoid contracting or submitting to their partner.

3. Perceived benefits - This refers to the participants' belief that taking PrEP is beneficial and can be effective in preventing the transmission of HIV.
4. Perceived barriers - This refers to the participants' beliefs about potential obstacles to using PrEP. These could be barriers related to access, adherence, side effects, relationship dynamics, and partner support.
5. Cue to action - This is the stimulus needed to trigger the decision to use PrEP such as suggestion from a partner, health care provider or other trusted person, or the desire to conceive a baby.
6. Self-efficacy - This refers to the participant's level of belief that they can take PrEP and adhere to the regimen.

Specific to this study, individuals must believe that they are at risk for HIV, that it is worth taking PrEP to avoid HIV, and they must believe that they have self-efficacy (i.e., they are capable of adhering to the regimen and coping with potential side effects). Figure 1. provides a visual representation of the Health Belief Model as applied to this study.

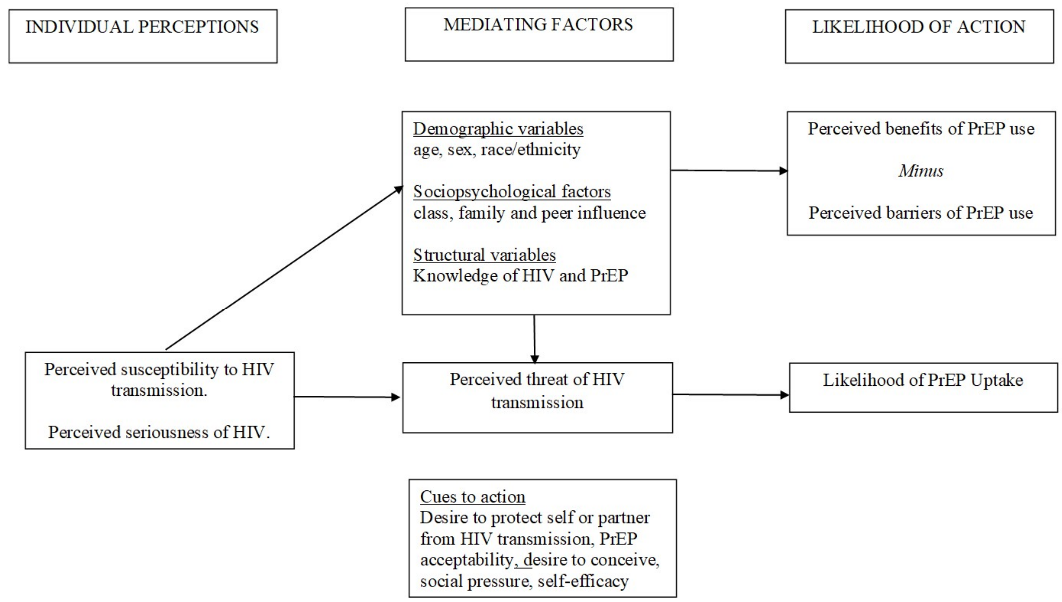


Figure 1. Schematic representation of constructs of the Health Belief Model along with examples of possible predictors of initiating PrEP Use among heterosexual HIV serodiscordant couples. Adapted from Strecher and Rosenstock (1997).

The Theory of Gender and Power

Developed in 1987 by Robert Connell, the Theory of Gender and Power examines societal inequities and power imbalance between males and females. The theory has three main constructs: 1) sexual division of labor, which examines economic inequities that favor men, 2) sexual division of power, which examines control and abuses of authority in institutions and relationships that favor males, and 3) cathexis, which examines affective attachments and social norms related to relationships between males and females (Wingood & DiClimente, 2002). This theory has been used extensively to explain the increased risks of HIV transmission for women in heterosexual relationships (Bowleg, Belgrave, & Reisen 2000; Panchanadeswaran, Johnson, Go, Srikrishnan, Sivaran, Solomon, et al., 2007; Rinehart, Al-Tayyib, Sionean, Whitesell, Driesbach & Ball, 2018; Wingood & DiClimente, 2000; Wingood, Dunkle, & Cooper, 2009;

Woolfork, Fox, & Swartzenruber, 2020). Findings from these studies have found that, specific to HIV prevention the following factors increase women's risk for transmission: 1) living in poverty, lower educational attainment, unemployment/underemployment, and/or working in high demand – low control environments are at increased risks for HIV transmission (sexual division of labor), 2) experiences of physical and/or sexual abuse, significant exposure to sexually explicit media, high-risk steady partners, partners who disapprove of safer sex practices, and lack of access to drug treatment and HIV education (sexual division of power), and 3) partner or personal interests in having children, family influence unsupportive of HIV prevention, medical mistrust, conservative culture and gender norms, and religious beliefs that discourage the use of contraception (cathexis). Figure 2 provides a visual depiction of the Theory of Gender and Power as applied to this study. Specifically, this study posits that the constructs outlined in the Theory of Gender and Power influence whether women feel empowered to initiate PrEP use, whether they feel empowered to influence their male partners to use PrEP, and whether men feel compelled to use PrEP by their female partners based on societal and inter-relational power dynamics.

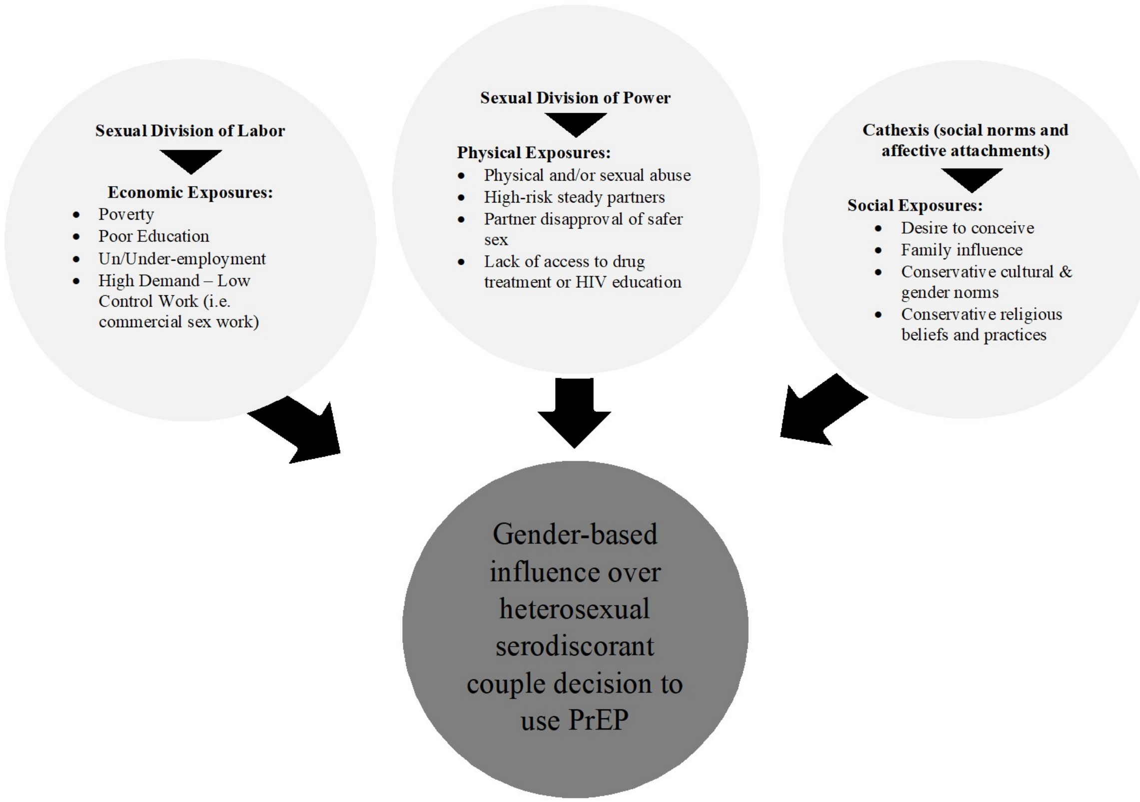


Figure 2. Theory of gender and power applied to the uptake of HIV pre-exposure prophylaxis in heterosexual HIV serodiscordant couples. Adapted from Flash et al. (2014) and Wingood et al. (2000).

Significance

To date, almost all studies conducted on PrEP uptake have been with MSM. The significance of this research is that it provides valuable insights into the factors that influence couples in serodiscordant relationships to decide whether to incorporate PrEP as a part of their HIV prevention regimen. Specifically, this study examines these factors in an understudied population – heterosexual serodiscordant couples. This study is unique in that it examines both couples that use PrEP and those who do not. This adds to the richness of the data because it may help increase the understanding of what motivates couples to make the decision to use PrEP, but also the potential barriers, challenges, and factors that contribute to couples opting not to use it. This is a topic of importance as it addresses a gap in the existing literature on this population. In addition, this study examined couples in the United States, whereas most studies have been conducted internationally. Studies conducted with heterosexual couples have primarily been related to knowledge, adherence, and effectiveness of PrEP in preventing HIV transmission once the couple has already made the decision to use PrEP. Understanding why heterosexual serodiscordant couples to decide to use PrEP in the first place and understanding barriers and challenges to PrEP uptake in this population has the potential to provide information about how to better address these challenges and promote the benefits of PrEP use in this high-risk group. Specifically, the knowledge gained from this understanding can help to identify modifiable factors that can lead to the development of interventions to improve PrEP uptake and adherence in heterosexual serodiscordant couples.

Definition of Terms

Biomedical interventions. The term ‘biomedical interventions’ refers to the use of medications and/or vaccines to prevent or reduce HIV infection. As opposed to behavioral interventions which seek to help people reduce risk-taking behaviors as a means of prevention, biomedical interventions seek to decrease infectiousness, prevent transmission, or reduce susceptibility to the virus (Effective Interventions 2012).

HIV Pre-exposure Prophylaxis (PrEP). HIV pre-exposure prophylaxis refers to the practice of persons at high risk for HIV transmission, who are not infected with HIV, taking a lower dose of HIV treatment drugs to prevent HIV infection.

Serodiscordant. A serodiscordant relationship is one in which one partner has HIV and the other partner does not. This study focused on heterosexual serodiscordant relationships, or relationships where either the male or female in the relationship is living with HIV.

Overview of Chapters

This chapter served as an overview of relevant background information and provided the rationale and significance of this study. Chapter 2 will provide an overview of the existing literature on PrEP, with a particular focus on serodiscordant couples and PrEP uptake. The literature review will review the literature on heterosexual couples but will also incorporate some literature on other populations as this accounts for most of the studies that have been conducted on this topic and may still provide relevant information, insight and highlight gaps in existing literature. Chapter 3 provides an overview of the methodology of the study, which is based on Charmaz's (2006) approach to grounded theory. Chapter 4 is an overview of the results from the study including the overarching themes that were identified during the analysis of the data. Finally, Chapter 5 will discuss the implications for the findings, limitations of the study, as well as suggestions for future research.

Chapter II: Review of the Literature

HIV Incidence and Prevalence

In 2019, there were 36,801 new cases of HIV in the United States, down from 37,741 new cases in 2018 (CDC, 2019). Despite marked decreases in new HIV transmissions since the height of epidemic in the mid-80s, recent data indicate that this progress has stalled. The slow progress in the reduction of new HIV infections may be because HIV prevention interventions and treatment are not reaching the high-risk people who might benefit from them the most (CDC, 2019). Included in these high-risk groups are heterosexual individuals who have unprotected vaginal and anal sex with partners who are either known to be living with HIV or with unknown HIV status. According to the most recent statistics from the CDC, 9,008 new cases were attributed to heterosexual transmission in 2018. This represents approximately 23.8% of the new cases of HIV in 2018. The vast majority of heterosexual transmission is among women (67.6%) and 56% of the total new heterosexual transmission cases (N= 3750) occurred among Black women. Addressing heterosexual HIV transmission of HIV would represent significant decreases in the risk of transmission for heterosexual persons. In addition, it would result in significant decreases in the rate of new HIV transmissions among women, as 85% of women who become HIV positive through heterosexual contact (CDC, 2019).

Risk Groups

Men Who Have Sex with Men (MSM)

Since the beginning of the HIV epidemic in the United States, MSM have been disproportionately affected. While this group only accounts for approximately 3% of the United States population (Ward, Dahlhamer, Galinsky, & Joestl, 2014), MSM accounted for 69% of the new cases of HIV in 2018 (CDC). At the onset of the epidemic in 1980, the medical community noticed that gay men were becoming severely ill with a previously unknown illness. The disease was initially called GRID (Gay-Related Immune Deficiency) and was found to target the immune systems of previously healthy persons. Because the disease was only found in gay men at first, the response was slow, resulting in the loss of nearly 12,000 gay men to the disease. It also resulted in stigma, homophobia, and fear throughout the country. Although we now know that risk behavior, not sexual orientation, is what places individuals at risk for HIV transmission, MSM continue to be at highest risk, and therefore at the epicenter of the efforts to address the epidemic in the United States.

People Who Inject Drugs

At the end of 2018, 1 in 15 of new HIV diagnoses were among people who inject drugs (PWID). During this same time frame, 122,112 PWID were living with HIV (CDC 2018). The specific HIV transmission risks to PWID are associated with sharing needles, syringes, and other drug injection equipment which can lead to the exchange of blood. According to the 2017 PrEP Clinical Practice Guidelines, PWID as well as people who have unprotected vaginal or anal sex with partners who inject drugs are high risk populations who could benefit from using PrEP as an HIV prevention method (CDC 2017).

People in heterosexual partnerships

In 2018, there were 7554 new cases of HIV that were a result of heterosexual intercourse. African American women accounted for half of these cases (50.4%) followed by African American men (22%), Hispanic women (14.6%), and White women (13%) (CDC 2019). Women contract HIV during vaginal sex primarily through the lining of the vagina or cervix when they come into contact with blood, semen, or pre-seminal fluid. Men are at risk of contracting HIV during vaginal sex through contact with blood or vaginal fluid that may enter through the tip of the penis, cuts or sores on the penis, or through penile foreskin when uncircumcised. In addition, heterosexual couples who engage in anal sex are at risk for HIV transmission because the lining of the rectum is very thin. Male partners are also at risk of contracting the virus from anal fluids and secretions that enter the body through cuts, sores, and uncircumcised foreskin (Doncel, Anderson, & Zalenskaya, 2014; Tebit, Ndembi, & Weinberg, 2012; Yi, Shannon, Prodger, McKinnon, & Kaul, 2013).

Heterosexual serodiscordant couples

According to the CDC (2018), there are an estimated 140,000 HIV serodiscordant couples in the United States. Most men and women living with HIV report having a primary partner or spouse (58% and 70% respectively) and over half of those who report having a primary relationship state that their partner is HIV negative (Chen, et al., 2001; Lampe et al., 2011). Because of the high number HIV serodiscordant couples, and the high risk of HIV transmission, the CDC has identified this population as a high-risk group that should be targeted for PrEP and counseled about the risks and benefits of its use. Despite this recommendation, PrEP uptake among HIV serodiscordant couples remains low.

While most studies do not account for anal intercourse among heterosexual couples, recent data estimates that the risk of HIV transmission for a person with a vagina, having a penis inserted in their vagina (receptive penile – vaginal intercourse) is 8 per 10,000 exposures (95% CI = 6 – 11). For a person with a penis, inserting their penis into a vagina (insertive penile – vaginal intercourse) has an estimated HIV transmission risk of 4 per 10,000 exposures (95% CI = 1 – 14) (Patel, Borkowf, Brooks, et al., 2014). Estimates from other studies range from 0.08% – 0.19% per sexual act for receptive vaginal intercourse and from 0.05% - 0.1% for insertive vaginal intercourse. The risk of HIV transmission is highest when persons with unsuppressed HIV viral loads engage in risk behaviors such as unprotected vaginal and anal intercourse. According to one study, the percentage of persons with unsuppressed viral loads was highest among heterosexuals (67.3% of heterosexual men with HIV and 65.5% of heterosexual women with HIV) (Hall, Holtgrave, Tang, Rhodes, 2013).

Racial/Ethnic populations

The latest HIV surveillance data from the CDC (2018) reveal that African Americans had the highest number of new cases of HIV among the different racial/ethnic groups. While African Americans only make up 13.4% of the population, they accounted for 16,017 or 42% of reported HIV cases in 2018 (74.3% men, 25.7% women). The Hispanic/Latino population accounted for 26.7% of new cases, Whites represented 25.4% of new cases, and Asians and those who were multi-racial accounted for 2% of new cases each. These statistics underscore the need for targeted efforts to decrease address risk factors and transmission among certain racial/ethnic groups, particularly African Americans and Hispanics/Latinos.

Prevention of HIV Transmission among Heterosexual Serodiscordant Couples

Condom Use

Prior to the availability of PrEP, condom use combined with treatment of the partner living with HIV with protease inhibitors was widely considered the most effective means of preventing HIV transmission among HIV serodiscordant couples (Castillo, Del Romero, Hernandez; Marincovich; Garcia, & Rodriguez, 2005; Kalichman, Rompa, Luke, & Austin, 2002; Supervie, Viard, Costagliola, & Breban, 2014). It is estimated that consistent condom use alone can reduce the risk of HIV transmission up to 70% (Giannou, Tsiara, Nikolopoulos, Talias, Benetou, Kantznoa, et al., 2016). This research also indicated that serodiscordant couples were less likely to report unprotected sex when the positive partner was taking protease inhibitors (van der Straten, 2000). While condom use is effective in reducing the risk of HIV transmission among heterosexual serodiscordant couples, there is still an estimated risk of 11% over a 10 year period when condoms are the primary mode of HIV transmission prevention (Lasry & Sansom, 2014).

While some studies show that consistent condom use is relatively high in heterosexual serodiscordant couples, there is a body of research that has also found that condom use is low and tends to decrease over time in primary relationships. This leads to increased HIV transmission risk among this population over time (Corbett, Dickson-Gomez, Hilario, & Weeks, 2009; Lasry, Sansom, Wolitski, Green, Borkowf, Patel, & Mermin, 2014; McMahon, Myers, Kurth, Cohen, Mannheimer, Simmons, et al., 2014).

Behavioral vs. Biomedical Prevention Methods

Since the inception of the HIV epidemic in the United States, efforts have been focused on prevention of HIV through behavioral change. There have been studies of efficacious and effective interventions and curricula to educate and motivate various populations to use condoms (Burton, Darbes, & Operario, 2010; Koniak-Griffin, Lesser, Takayanaga, & Cumberland, 2011), reduce the number of sexual partners (Harvey, Kraft, West, Taylor, Pappas-DeLuca, & Beckman, 2009), and avoid sharing needles during injection drug use (El-Bassel, Gilbert, Wu, Witte, Chang, Hill, & Ramien, 2011). With intervention methods such as Treatment as Prevention (TaSP), Prevention for Positives (PfP), and the recent FDA approval of Pre-exposure prophylaxis (PrEP) for use among those individuals at high risk for HIV infection, there is the possibility of the use of biomedical interventions that can reduce HIV transmission risk for those who are HIV negative.

Treatment as Prevention

Treatment as Prevention (TasP) is the practice of people living with HIV taking Antiretroviral Therapy (ART) to achieve an undetectable viral load. This results in significantly lower transmission risk for HIV negative sex partners. The clinical basis for TasP effectiveness is based on two studies conducted with heterosexual serodiscordant couples in Zambia and Uganda which found that when HIV infected partners had lower viral load the risk of HIV transmission was lower (Fideli, Allen, Musonda, Trask, Hahn, Weiss, et al., 2001; Quinn, Wawer, Sewankambo, Serwadda, Wabwire-Mangen, Meehan, et al., 2000). For HIV serodiscordant couples, ART is considered a viable preventative measure because when taken consistently, the risk of sexual transmission of HIV is reduced by an estimated 96.9% (Cohen et al., 2011; Hammer, 2011). While ART adherence, resulting in undetectable viral loads, is considered one of the most effective ways of ensuring that people with HIV live longer, healthier lives, as well as reducing the risk of sexual transmission to HIV negative partners, adherence to ART among heterosexual discordant couples has not been extensively studied (Baggaley, White, Hollingsworth, & Boily, 2013; Loutfy, Wu, Letchumanan; Bony, Antoniou, Margolese, et al., 2013). What is known is that approximately 88.6% of people living with HIV who receive treatment in the United States achieve full viral suppression (CDC, 2020), but even small lapses in ART adherence can lead to antiretroviral resistance and increased viral shedding leading to increased transmission risk (Ramien, Dolezal, Wagner, Goggins, Wilson, Gross, et al., 2014). TasP remains is of the most effective means of reducing HIV transmission risk among HIV serodiscordant couples.

Prevention for Positives (PfP)

In the early years of HIV prevention, most of the emphasis was placed on reducing risk taking behaviors among persons known or believed to be HIV seronegative. In recent years researchers have shifted their approach and now consider that all HIV transmissions begin with positive individuals and therefore, any complete prevention initiative includes reducing risk behaviors among people living with HIV (Fisher & Smith, 2009). Intervention methods among this population include increasing adherence to ART, increasing condom use, and curtailing behaviors that increase risk of acquiring infectious diseases that compromise the health of people living with HIV. Ensuring that people living with HIV are healthy and engage in behaviors that reduce the risk of transmission is a crucial piece of the HIV prevention puzzle.

Pre-exposure Prophylaxis (PrEP)

According to the Centers for Disease Control and Prevention (CDC), daily oral Pre-exposure prophylaxis (PrEP) can reduce HIV transmission through sexual contact by 90-100% when taken as prescribed (CDC, 2018). Although prescribed to be taken every day regardless of risk behaviors, tenofovir disoproxil fumarate (TDF)/emtricitabine (FTC) drug concentrations, when used as PrEP, may reach adequate levels to protect against HIV in MSM when taken at least four times a week (Grant, Anderson, McMahan, Liu, Amico, Mehrotra, et al., 2014; Haberer, Bangsberg, Baeten, Curran, Koechlin, Amico, et al., 2015). Women need to take 6-7 doses to reach adequate levels to protect against HIV (Cottrell, Yang, Prince, Sykes, White, Malone, & Kashuba, 2016; Hendrix, Andrade, Bumpus, Kashuba, Marzinke, Moore, & Patterson, 2016). Numerous PrEP trials have indicated, however, that adherence to PrEP is frequently insufficient to prevent HIV acquisition in various populations (Bazzi, Drainoni, Biancarelli, Hartman, Mimiaga, Mayer, & Biello, 2019; Corneli, Deese, Wang, Taylor, Ahmed, & Agot, 2014; Sidebottom, Ekstrom, & Stromdahl, 2018).

The approval of PrEP as a means of reducing HIV infection risk in high-risk individuals represents a paradigm shift in HIV prevention methods from strictly behavior modification into the biomedical realm. However, as many subsequent studies have demonstrated, PrEP cannot be implemented as a strictly biomedical prevention strategy. After FDA approval, several studies have demonstrated poor adherence (Bazzi, Drainoni, Biancarelli, Hartman, Mimiaga, Mayer, & Biello, 2019; Sidebottom, Ekstrom, & Stromdahl, 2018). In particular, the FemPrEP study, which was conducted with 2120 HIV negative women in Kenya, Tanzania and South Africa was discontinued due to low drug adherence rates and lack of significant reduction in HIV acquisition (Corneli, Deese, Wang, Taylor, Ahmed, & Agot, 2014). At study visits, participants received counseling (risk reduction, contraceptive use) and free condoms. Despite this, 33 women in the treatment group acquired HIV during the trial and blood tests demonstrated low levels of PrEP during the infection window. One of the main reasons researchers in this study believe that adherence was so low was that the majority of women in the study (70%) believed that they were had little or no risk for HIV infection. Prior behavioral research has concluded that accurate perception of risk is one of the main predictors of adherence to disease prevention measures (Amico & Stiratt, 2014; Detsis, Tsioutis, Karageorgos, Siderglou, Hatzakis, & Mylonakis, 2017; Schaefer, Gregson, Fearon, Henson, Hallett, & Hargreaves, 2019; Warren, Paterson Schulz, Lees, Eakle, & Larson, 2018). This finding underscores the need for creating and implementing evidence-based behavior change strategies in combination with biomedical interventions to maximize the benefits of PrEP in high-risk groups.

PrEP Uptake in the United States

In 2015, there were approximately 1.1 million adults with indications for PrEP use (Smith, Van Handel, Wolitski, et al., 2015). Among these, there were an estimated 258,080 heterosexual adults with indications for PrEP use (171,670 females, 81,410 males) (Smith, Van Handel, & Grey, 2018). Despite the high number of people in the United States with PrEP indications, there were only 90,000 filled prescriptions for PrEP in 2017 (National Center for HIV/AIDS, Viral Hepatitis, STD, & TB Prevention, 2018). Only 4.7% of these prescriptions were among women, and the majority of the prescriptions (68.7%) were given to White persons, despite what we know about the elevated risk of HIV transmission among Black and Hispanic people (Crepaz, Dong, Wang, Hernandez, & Hall, 2018); Nosyk, Krebs, Zang, Piske, Enns, Min, et al., 2020). In addition, the CDC reports that nearly one-third of MSM report taking PrEP (Kanny, Jeffries, Chapin-Bandales, Denning, Cha, Finlayson, et al., 2017). There is a need for understanding factors that can influence the uptake of PrEP among racial/ethnic minorities, women, and heterosexual serodiscordant couples to ensure that this prevention method reaches those most likely to benefit from its use.

Factors that Influence PrEP Uptake

Although there is a growing body of evidence that PrEP can be an effective means of preventing HIV transmission, it is not used widely, particularly among heterosexual couples and individuals (McMahon et al., 2014). In this study, I used the Health Belief Model (HBM) and the Theory of Gender and Power to better understand the barriers and facilitators of PrEP use among heterosexual serodiscordant couples. According to the HBM there are multiple factors that may influence a couple to use or decline to use PrEP. According to the HBM, factors that contribute to PrEP use/non-use include perceived susceptibility to HIV transmission and modifying factors (demographic characteristics, internal and external cues to action). The likelihood of actually taking an action (i.e., initiating PrEP use) is also influenced by perceived benefits, perceived barriers, and the participants' belief that they can successfully take an action (self-efficacy). The section below will describe barriers and facilitators to PrEP uptake among heterosexual serodiscordant couples based on the HBM.

Perceived Susceptibility to HIV

One of the main factors that influences whether a person chooses to protect themselves from HIV transmission is whether the person accurately assesses their risk (Lammers, vanWijnbergen, & Willebrands, 2011; Prata, Morris, Vahidnia, & Stehr, 2006). The issue with inaccurate risk perception in any high-risk group is that there is significant evidence that low risk perception contributes to high-risk sexual behaviors

(Biggs & Foster, 2013; Foster, Higgins, Kamsek, Ma, & Grossman, 2012; Pollack, Boyer, & Weinstein, 2013). Women in heterosexual relationships who do not perceive themselves as high risk are more likely to use condoms inconsistently and are more likely to believe that their primary intimate partners represent a low HIV transmission risk (Hickey & Cleveland, 2013; Matson, Chung, Sander, Millstein, & Ellen, 2012; Noar, Webb, Van Stee, Feist-Price, Crosby, Willoughby, & Troutman, 2012). People with high-risk behaviors and low risk perception often fail to personalize information about HIV risk and consistently underestimate their own risk for HIV acquisition and are harder to reach with programs and initiatives to reduce HIV transmission because they do not view themselves as the target of these efforts (Khawcharoenporn, Kendrick, & Smith, 2012; Whiteside, Harris, Scanlon, Clarkson, and Duffus, 2011). Sales & Sheth (2019) found that among 560 Black women in the South, higher perceived risk of HIV transmission predicted greater interest in PrEP. In addition to impacting the HIV risk reduction measures in general, risk perception can also impact willingness to take PrEP (Garrett, Wheeler, Olivia, Reed, Conley, Alvarenga, et al., 2019).

Other research has found that the way that people conceptualize risk may be different than the way it has been framed by medical and social science researchers. Some people may not perceive their risk for HIV to be high, based on other factors such as viral suppression of their partner who is living with HIV (Eisenger, Dieffenbach, & Fauci, 2019; Pereira, Caldeira, & Monteiro, 2018; Persson, 2015; Van Den Boom, Stolte, Sandfort, Prins, & Davidocich, 2013), relationship duration (Corneli, McKenna, Headley, Ahmed, Odhiambo, Skhosana, 2014; Milam, Richardson, Espinoza, & Stoyahoff, 2006; Stephenson, White, Darbes, & Sullivan, 2015), and negative HIV tests of the uninfected partner over time (Persson & Richards, 2008; Reis & Geir, 2009). These factors have caused researchers to call for a reframing of risk from the strict, linear focus on risk perception leading to changes in behavior, to focusing on how people frame risk taking within the context of their relationships (Green & Sobo, 2000; Lupton, 1999; Persson, 2013).

Modifying Factors

Demographics. Research on PrEP uptakes suggests that being older (Pyra, Rusie, Baker, Baker, Ridgway, & Schneider, 2020; Rubtsova, Wingood, Dunkle, Camp, & DiClemente, 2013; Taggart, Liang, Pina, & Albritton, 2020), having higher educational attainment (Bauermeister, Meanley, Pingel, Soler, & Harper, 2013; Klein & Washington, 2019; Rucinski, Mensah, Sepkowitz, Cutler, Sweeney, & Myers, 2013), being White (Jones, Smith, Thorne, Wiener, Michaels, & Gasparac, 2020; Saleska, Lee, Leibowitz, Ocasio, & Swendeman, 2020), and being a MSM (Refugio, Kimble, Silva, Lykens, Bannister, & Klausner, 2019; Sanders, Thimm, Johnsen, & Page, 2017) makes one more likely to find PrEP use acceptable and more likely to take PrEP.

Internal Cues to Action. Internal cues to action refer to those factors that an individual experiences that contribute to the decision to adopt a health promoting behavior. The literature has found three main cues to action that people report as the reasons they take PrEP or engage in other HIV prevention behaviors. They are: desire to protect a partner from HIV transmission, desire to maintain normalcy, and the desire to conceive.

Desire to protect one's partner from HIV transmission. HIV prevention altruism is defined as "the values, motivations, and practices of caretaking towards one's sexual partners to prevent the transmission of HIV" (Nimmons, Acree, &Folkman, 2000). In studies primarily conducted with MSM, researchers have found that HIV prevention altruism is one of the factors associated with PrEP uptake (D'Angelo, Lopez-Rios, Fynn, Pantalone, Holloway, & Grov, 2019; John, Starks, Rendina, Grov, & Parsons, 2018; O'Dell, Rosser, Miner, & Jacoby, 2008). There has been limited comparable research conducted in heterosexual serodiscordant couples, but desire to protect negative partners from HIV infection may be a motivating factor for PrEP use in heterosexual couples as well. In one Kenyan study that interviewed people living with HIV and 30 of their HIV negative partners, desire to prevent HIV transmission to HIV negative partners did emerge as a theme in the data. This theme did not seem similar to the concept of HIV prevention altruism that has emerged in data on MSM in that when discussed, prevention was described as more of a duty and a responsibility rather than a means of expressing care and concern for one's partner. The data also showed that women were held more accountable for use of HIV prevention measures (i.e., it is her duty to "remind" male partners to use condoms) and often feared that they might experience interpersonal violence if their partner were to become HIV positive (Patel, Leddy, Odoyo, Anand, Stanford-Moore, Wakhungu, et al., 2018). Another qualitative study conducted with 20 Kenyan couples revealed that the desire to protect HIV negative partners from infection was a motivating factor in initiating PrEP use. This study also revealed that remaining negative at follow-up visits increased the desire to continue and adhere to PrEP (Ngure, Heffron, Curran, Vusha, Ngutu, Mugo, et al., 2016).

Desire to maintain normalcy. Another recurring theme in the extant literature is that couples are motivated to use PrEP by a desire to re-establish and maintain normalcy in their relationships. Kenyan couples who participated in a 2016 study about PrEP uptake motivations expressed that taking PrEP allowed HIV negative partners to maintain their commitment to their partners who are living with HIV without having concerns about HIV transmission (Ngure, Heffron, Curran, Vusha, Ngutu, Mugo, et al., 2016). Other findings among heterosexual couples dealing with discordancy indicate that they are often motivated by the desire to maintain stability, both economically and emotionally for their families and for their relationships (Patel, Leddy, Odoyo, Anand, Stanford-Moore, Wakhungu, et al., 2018). In 2017, Bazzi, Leech, Biancarelli, Sullivan, & Drainoni found that some participants felt closer to their partners because they were able to have sex without condoms. Studies among serodiscordant MSM couples have found that the men feel increased intimacy when they are using PrEP because they can opt not to use condoms and still have deceased HIV transmission risk (Gamarel & Golub, 2015; Golub, Starks, Payton, & Parsons, 2012; Grant, Lama, Anderson, McMahan, Liu, Vargas, et al., 2010).

Desire to conceive. One factor that might motivate heterosexual serodiscordant couples to use PrEP is the desire to have children. There has been quite a bit of research on the safety and efficacy of PrEP use for this purpose (Heffron, Pintye, Matthews, Weber, & Mugo, 2016; Heffron, Thompson, Celum, Haberer, Ngure, Mugo, et al., 2018; Hoffman, Jaycocks, Vardavas, Wagner, Lake, Mindry, et al., 2015; Whetham, Taylor, Charlwood, Keith, Howell, McInne, et al., 2016) and research has found that PrEP use before and after conception is both safe and effective in preventing HIV transmission from male to female partner and vice versa. Of the more than 140,000 serodiscordant couples in the United States, nearly half desire to have children (Lampe, Smith, Anderson, Edwards, and Nesheim, 2011). For HIV negative males wishing to conceive with a partner who is living with HIV, PrEP use coupled with ART use of the female partner can be an effective way to prevent transmission. Women with male partners living with HIV may take PrEP coupled with either sperm washing and/or ART use of the partner living with HIV (Kawass, Smith, Kissin, Haddad, Boulet, Sunderman, et al., 2017; Leech, Biancarelli, Aaron, Miller, Coleman, Anderson, et al., 2020; Sun, Wang, Liu, Xin, Zhu, Li, et al., 2015).

What is less known is whether the desire to conceive is a motivating factor for PrEP uptake among serodiscordant couples. Because PrEP knowledge and uptake has been relatively low in the United States, couples may be unaware of the option to use PrEP as a means of preventing HIV transmission during conception. More research is needed to determine whether couples wishing to conceive are motivated to use PrEP and how to encourage uptake in this population.

External Cues to (In)Action. External cues to action are those factors that occur in an individual's family, community or culture that influence the decision to adopt or not adopt health promoting behaviors. Below I will discuss what is currently known about external cues to action related to PrEP use. Stigma is one barrier to PrEP use, while the literature shows heterosexual women and men experience different cues to action.

Stigma. One of the barriers to PrEP uptake may be stigma related to the use of HIV medications. In 2020, Calabrese et al. conducted an online survey of 597 women attending Planned Parenthood clinics in Connecticut. They found that participants were concerned that if they were to use PrEP, people would assume that they were living with HIV, "bad," or gay. Study results also found that 30% of participants stated that if they were to take PrEP, they would be ashamed to disclose this to others. In addition, 36% expected disapproval from family, 34% expected disapproval from sexual partners, and 25% expected disapproval from friends. Expected disapproval from others was associated with less interest in and intention to use PrEP, as well as discomfort in discussing PrEP use with providers. Similarly, a focus group of 20 women in New York City found that women believed that stigma related to PrEP use could reduce uptake. Specifically, they worried that family and friends may question why they were using "HIV medicines" and assume that they were living with HIV (Goparaju, Praschan, Warren-Jeanpiere, Experton, Young, & Kassaye, 2017). Women in another qualitative study conducted in the United States (n = 144) believed that external and internalized stigma might prevent women from taking PrEP. They also expressed concerns that sexual partners might assume that they were living with HIV (Auerbach, Kinsky, Brown, & Charles, 2015). In a focus group involving heterosexual men and women (n = 58), some participants expressed that they would experience embarrassment if their peers knew they were taking PrEP and believed that PrEP use might be perceived as an admission that they engaged in risky sexual behavior or were living with HIV (Smith, Toledo, Smith, Adams, & Rothenburg, 2012). A qualitative study of 28 medical providers who prescribe PrEP felt that stigma significantly affected PrEP uptake. Specifically, they believed that the prescription requirement was a particular barrier for those who had mistrust of medical providers or low health literacy (Calabrese, Tekeste, Mayer, Magnus, Krakower, & Kershaw, 2019).

There has been a small body of research examining stigma of PrEP use among heterosexual serodiscordant couples (Falcão, Bradshaw, Garrett, Bilardi, Chen, Zablotska, I., ... & Williams, 2016; Ngure, Heffron, Curran, Vusha, Ngutu, Mugo, &

Baeten, 2016). While there has only been a small amount of research in this area, many of the findings discussed above could be relevant to this group as well. In particular, HIV negative partners in such relationships might experience stigma around that perception that they, like their partners are living with HIV. Additionally, if couples have not disclosed the HIV status of the positive partner, discovery or disclosure of PrEP use may lead to stigma among family and peers. Targeted efforts to reduce stigma related to PrEP use may increase PrEP uptake in heterosexual populations, particularly among couples in serodiscordant partnerships.

PrEP Acceptability among Heterosexual Women. There are multiple studies that have examined PrEP acceptability among heterosexual women. In 2013, Wingood, et al. conducted a random-digit telephone dial household survey of Black and White women to gauge factors that would increase PrEP uptake in these groups. The survey sample consisted of 1042 Black women and 411 White women. Study results indicated that those of Black race, lower socioeconomic status, and lower educational attainment (high school education or less) were more likely to report that they would be willing to use PrEP. In the study, 69% of Black women and 54% of White women reported potential PrEP use, unemployed women were 1.8 times more likely to potentially use PrEP, and women with a high school education or less were twice as likely to report potential PrEP when compared to women with at least a college education.

In a 2014 focus group study of 26 Black women ages 20-50, Flash et al., found that women were concerned about potential side effects and presented this as a potential barrier to PrEP uptake, However, women were attracted to potential use of PrEP because it is a female-controlled method that does not require condom negotiation with male partners who may not be open to using them. Additionally, oral PrEP did not require disclosure to partners. Women in this study saw these factors as advantageous, particularly when weighing concerns about potential unfaithfulness of male partners.

A 2015 study by Auerbach and colleagues, found that distrust of the medical system, stigma, cost, concerns about adherence, and potential side effects, were factors that influenced PrEP uptake among high-risk women. Women also had specific preferences for delivery mode. This same study found that African American women found the idea of taking a daily pill more attractive than the idea of using a vaginal gel or vaginal ring (like Nuvaring contraceptive). Women were concerned that the gel might be messy, might interfere with oral intercourse, may not provide protection during anal intercourse, and might have side effects such as irritation and rashes for both herself and her partner. Women expressed reluctance to insert a ring or other device into their vaginas because they were afraid that they may not place it correctly or that they may have trouble removing the device. Among women of child-bearing age, taking a daily pill was viewed as similar to taking daily contraception and could therefore be taken in conjunction with their daily birth control pill. Additionally, women felt that using a gel was less discreet, and the ability to protect oneself from HIV independent of partner consent and knowledge was one of the main factors that made PrEP attractive to African American women. This finding contradicts findings in studies among African women who expressed preference for vaginal gels and gay men who preferred anal gels and lubricants.

PrEP Acceptability among Heterosexual Men. While there have been some studies conducted on PrEP acceptability among heterosexual women, even less is known about what factors influence PrEP acceptability among heterosexual men. One study of self-reported heterosexual HIV negative men found that 81% of men preferred either long-acting injectable (LAI) (48%) or oral PrEP (33%) over condom use. Having children, self-reported engagement in unprotected anal sex, and having higher risk scores was significantly associated with a preference for LAI (Cheng, Quaife, Eakle, Escobar, Vickerman, & Terris-Pressholt. 2019). Another qualitative study found high acceptability of PrEP among African American heterosexual men, although concerns were expressed regarding side effects, cost, and the burden of having to adhere to an HIV prevention regimen for life (Smith, Toledo, Smith, Adams, & Rothenburg, 2012). All other studies identified were conducted with MSM. The lack of information on how heterosexual men perceive PrEP and what makes this prevention method acceptable among this population is a barrier to developing best practices for increasing PrEP uptake among high-risk heterosexual men.

Gaps in Literature

To date, there has been little research on PrEP uptake among heterosexual individuals and couples. While there may be some relevance of studies conducted with MSM and foreign populations, the current study is unique in that it examines PrEP uptake in heterosexual couples in the United States.

Much research on the safety, efficacy, uptake and adherence of PrEP is among MSM. In addition, heterosexual serodiscordant couples in Africa and Asia have also been studied to determine PrEP uptake motivations. Unfortunately, little is known about what motivates heterosexual serodiscordant couples in the United States to use PrEP, and to date, uptake among this high-risk population has been low. Some research has been conducted to determine acceptability among women, men, and serodiscordant couples desiring to have children, but little is known about what motivates heterosexual serodiscordant couples to use PrEP. In addition, there has been some research on what makes PrEP use acceptable among heterosexual women, but very little research has been conducted to assess PrEP acceptability among heterosexual men. Having a better understanding of the barriers and facilitators of PrEP uptake is important to reducing HIV transmission among this population. This study is a starting point to begin gaining a better understanding of what factors contribute to PrEP use among heterosexual serodiscordant individuals and couples.

Chapter III: Methods

The present study used a qualitative approach to examine the potential barriers and facilitators of HIV PrEP use in heterosexual serodiscordant couples. This approach allowed me to examine the reasons participants gave for choosing or opting not to use PrEP as a transmission prevention method for the HIV negative partners in the relationship. Understanding how serodiscordant heterosexual couples make this decision is necessary for developing strategies that might encourage high risk couples to use PrEP. There are few studies about heterosexual serodiscordant couples, particularly as it relates to the relationship dynamics, barriers, and challenges that influence how these couples choose to reduce the risk of HIV transmission. As such, this study was intended to develop a deeper understanding rather than test a specific hypothesis. Much of the prior research on couples in serodiscordant relationships has been specifically focused on couples expressing the desire to safely conceive children. This study asked participants to identify barriers and facilitators to PrEP use, which may or may not include conception intentions, and therefore has broader applicability to couples whose PrEP use intentions are influenced by other factors.

Study Design and Sample

This study involved secondary data analysis. The original study was conducted between 2015 and 2016. Upon receiving IRB approval, participants for the parent study were recruited from 9 different HIV treatment and primary care clinics in a Northeastern city. To be eligible, one member of the couple had to be living with HIV, both individuals had to be 18 years of age or older and speak fluent English or Spanish. The HIV negative partner had to either be taking PrEP or previously received a PrEP consultation with a healthcare provider and determined to eligible to take PrEP based on state and CDC guidelines at the time of the interview. The partner living with HIV had to have disclosed their HIV status and couples had to be in a sexually active, heterosexual relationship with one another for at least 3 months. For the purposes of this study, sexually active was defined as having penetrative penile-vaginal or penile-anal intercourse with their primary partner in the last 3 months.

Study procedures included the completion of a quantitative survey and a qualitative interview. Quantitative surveys were administered by audio computer-assisted self-interview (ACASI) with a touch screen tablet and headphones using QDS version 2.6 software (NOVA Research Inc.). Survey items included questions regarding demographics; physical and mental health; health services utilization and experiences; PrEP knowledge, attitudes, use and adherence; and psychosocial factors related to HIV prevention. The Principal Investigator of this study was Dr. James McMahon at the University of Rochester. Qualitative interviews were completed by Dr. Janie Simmons at New York University using four different interview guides depending on the composition of the couple. Specifically, guides were created for the following individuals: 1) HIV Negative Partner, Non-PrEP user, 2) HIV Positive Partner, Non-PrEP user, 3) HIV Negative Partner, PrEP user, and 4) HIV Positive Partner, PrEP user. Having separate interview guides allowed the interviewer to ask tailored questions and allowed for deepened understanding of the decision to use or not use PrEP from the perspective of both the partner living with HIV and the HIV negative partner. All participants were asked questions about their relationship dynamics (i.e., general decision-making processes, conflict resolution), relationship status (i.e., married, dating, living together, relationship duration), number of children/desire for more children, drug use history, condom use, PrEP knowledge and attitudes, source of PrEP information, and how PrEP use/non-use impacts their relationship.

Couples completed surveys and interviews separately in private rooms to examine data for differences in perspective, to decrease bias, and to increase comfort in sharing sensitive information about sexual history and behaviors. Research indicates that when couples involved in research are interviewed separately, it is easier to capture unique perspectives (Taylor, B. & De Vocht, H, 2011). According to Morris (2001), when individuals interview jointly, they "represent themselves not just as individuals but as concurrent participants in a relationship." While joint interviews may serve valid purposes such as observing how couples co-create narratives and make joint decisions, the purpose this research was to understand individual perspectives on the decision to use PrEP, therefore couples were interviewed separately.

The current study involved secondary qualitative data analysis of the interviews described above. Fifty-four individuals (27 couples) who were involved in heterosexual serodiscordant partnerships completed survey measures. Qualitative data from 26 of the 27 couples was analyzed for the purposes of this study. One couple was excluded from qualitative data analysis because they did not speak English. While interviews were conducted with both members of the couple, the interviews were analyzed individually. I did read the interviews from each couple together so that I could compare the accounts that were given regarding relationship factors, PrEP use intentions, and viral suppression.

The study sample consists of 40 African American participants (77%), 9 Hispanic participants (17%), and 3 White participants (6%). The participants consisted of 10 couples where the male partner was living with HIV, and the female partner was HIV negative (38%) and 16 couples where the female partner was living with HIV and an HIV negative male (61%). The average age of overall sample was 49.4 years. The average age for the males in the sample was 50.2 years and the average age for the females in the sample was 48 years.

Data Analysis Plan

I used the framework analysis method to analyze data from this study. Framework analysis was originally developed by Ritchie, Spencer, Bryman, & Burgess (1994). Framework analysis was well suited for this study because it was designed for qualitative research that has specific question, limited time frame, and *a priori* codes or issues that have been identified from previous research or theoretical frameworks. The primary purpose of framework analysis is not to generate theories, rather it is designed to describe and develop a deeper understanding of a particular issue. In this study, framework analysis was used to develop a better understanding of the potential barriers, facilitators, and relational factors that influence the decision-making about PrEP use in heterosexual serodiscordant couples (see Figure 1). The data analysis framework used in this study was adapted from a model developed by Espinosa-González & Normand (2019).

While the interviews covered several topics, the entire interview for each participant was coded using the framework developed because individuals discussed factors related to PrEP use or non-use at various points during the interview. Analysis of the data using this model occurred in five cyclical phases: 1) familiarization of the data, which involved reading all of the transcripts and creating detailed notes on each transcript, 2) identifying the thematic framework, which involved identifying additional potential codes that emerged from the data and creating a data indexing tool that included *a priori* codes, emerging codes and an "other" category to account for additional emerging codes, 3) indexing the data, which involved applying the thematic framework to each transcript. I read and indexed the transcripts in four groups – male PrEP users, female PrEP users, male PrEP user partners, and female PrEP user partners. I annotated each transcript identifying where codes from the index applied, 4) charting involved arranging raw data into the framework, and 5) mapping and interpretation which involved identifying themes and interpreting the data. This was a back-and-forth process until themes were refined. (See Figure 1).

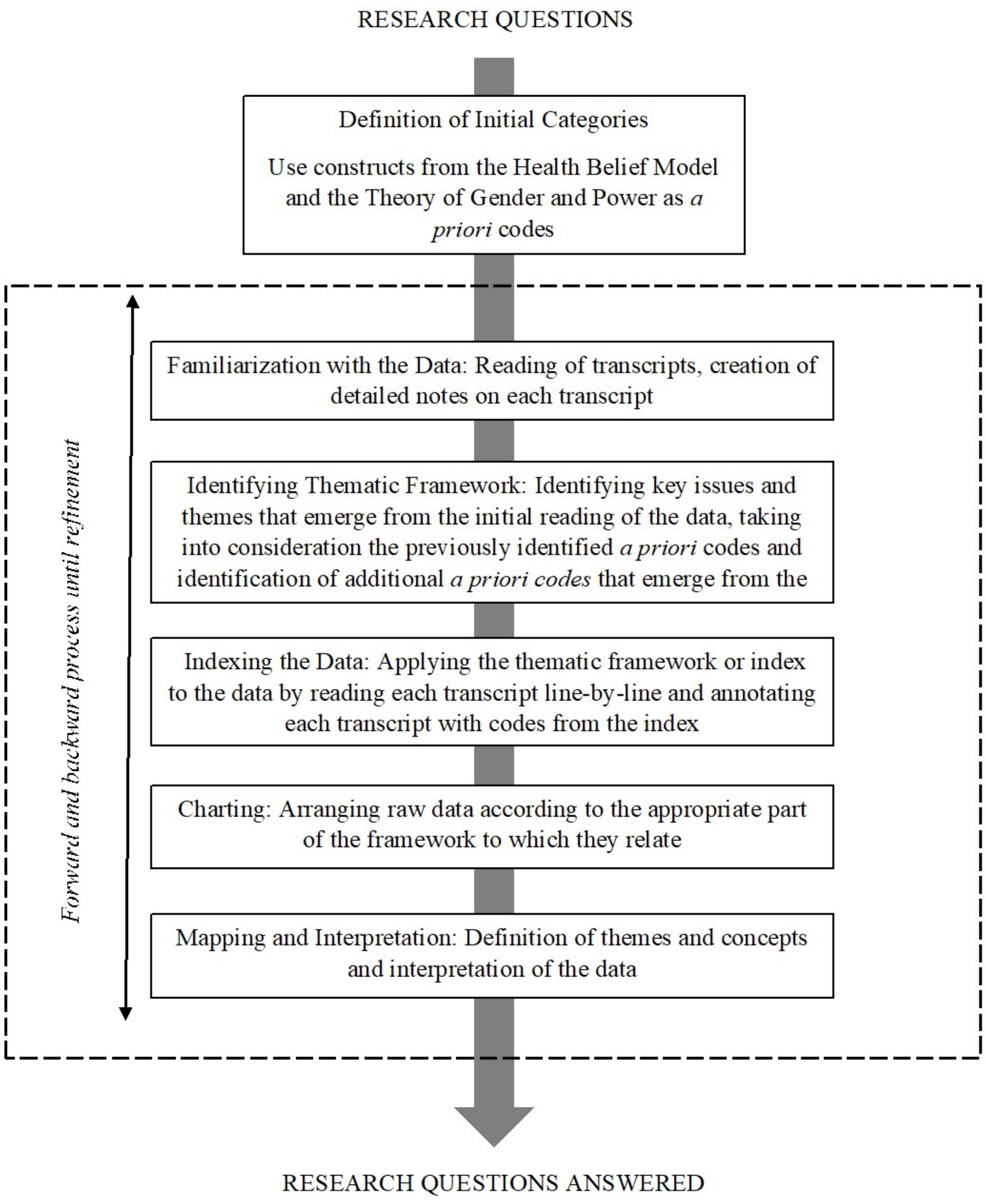
Table 1

A priori codes

Model	***A priori* code**
Health Belief Model	Perceived susceptibility to HIV
	Desire to protect one's partner
	Desire to conceive
	Stigma
	PrEP acceptability
Theory of Gender and Power	Sexual division of labor
	Sexual division of power
	Cathexis

Figure 3

Framework Analysis Process for Analyzing Data



Validity of Qualitative Research Methods

The validity of qualitative research is often questioned in behavioral and social science. According to Treharne and Riggs (2014), there are three aspects to establishing validity of qualitative research findings: 1) personal reflexivity and end-user involvement, 2) transferability of findings, and 3) triangulation. Personal reflexivity refers to the awareness that a researcher has of their own influence over the research as well as the involvement of the "researched" in the research process. To ensure continued reflexivity, I have included a section about my own experiences and potential biases related to the subject matters engaged in this study. I also kept notes of my own thoughts throughout the data analysis process as I discovered new themes and findings in the data. As it relates to the involvement of the researched in this process, this study used secondary data, however, I engaged with the qualitative and quantitative literature as well as my dissertation advisor. Dr. Mona Mittal, who has conducted extensive research in the field to ensure accurate portrayal of the experiences of the population(s) involved in this research.

Transferability of findings relates to the likelihood that the findings from the present study will be applicable to other members of the community/population under study. Transferability was examined throughout the analysis process through engagement with extant literature and my dissertation advisor.

Finally, triangulation is the use of more than one kind or source of data in research to determine whether findings transfer to different contexts. Triangulation was conducted through engagement with my advisor, examination of themes across all participants involved in this study, and examination of findings from other studies in similar populations.

Reflexivity

In qualitative research, reflexivity is the process of examining one's own experiences, views and perspectives and being attentive to how these factors play a role in the research being conducted. This is particularly important because in qualitative research, the researcher is the instrument. The validity of the findings of qualitative inquiry requires that the researcher is constantly reflecting and questioning how their positions affect the research.

This data involves primarily African American and Latinx individuals involved in heterosexual relationships where one partner is living with HIV. As I examined issues of gender and power, it was important that I acknowledged my positionality as a heterosexual cis-gender African American woman who is involved in a relationship with a heterosexual cis-gender African American man. My views about how decisions should be made within such relationships could influence how I viewed decision-making processes and relational factors within the couples in this study. It was crucial for me to be attentive to this possibility to avoid bias and judgement about how individuals and couples make decisions about how to best protect and care for themselves and their partners. As I analyzed the data, it was imperative that I remembered that dynamics and norms within couples vary and that people use various means to determine what is best for them, what social and sexual practices are desirable, and what risks are acceptable in their lives and in their relationships. Additionally, I have worked in the field of sexual and reproductive health nearly 20 years and many of those years were spent working directly in the field of HIV prevention. As a researcher with a background in the sexual health field, it was important not impose my views as a content expert (a professional working within the field) onto context experts (people with lived experience). I recognize that my passion for this research has the potential to contribute a great deal to the field, but I also wanted to remain diligent to ensure that as I delved into this data that I was aware of my own biases and experiences and honor the stories and experiences of the participants in this study on their own terms.

Chapter IV: Results

This study sought to better understand the barriers, facilitators, and relationship factors that influence the decision to use or not use PrEP among heterosexual HIV serodiscordant couples. The sample consists of a total of 26 couples (52 individuals). All 52 participants completed individual semi-structured interviews about their relationships, PrEP knowledge, and their decision-making process regarding PrEP. Of the 26 couples in the study, 15 of the HIV negative partners were using PrEP (8 female, 7 male) and 11 were not (10 male, 1 femalere). The 52 participants shared their experiences, stories, and feelings related to the impact of HIV on their lives and relationships, and their knowledge, attitudes, and beliefs about PrEP use. Four different question guides were used based on PrEP Use/Non-Use and HIV status. Within PrEP non-user and PrEP user couples, both the partner living with HIV and the HIV negative partner were asked questions regarding the decision to use/not use PrEP, including how that decision impacted their relationship, current sexual practices, and HIV prevention measures. The questions guiding this study are outlined in Appendix A.

While the main focus of the analysis was on the questions in Appendix A, I read the entire transcripts for all of the interviews in order to gain better insight into the relationship dynamics of the couples in the study. In addition, because the interviews were semi-structured, there was information throughout the interviews that provided context for the factors that influenced HIV negative partners to use or not to use PrEP. In this study I used two theoretical frameworks to organize the findings – the Health Belief Model (Champion & Skinner, 2008) and the Theory of Gender and Power (Wingood & DiClimente, 2002). The constructs from these two models served as *a priori* codes for the potential facilitators, barriers, and relationship factors that influence use or non-use of PrEP among heterosexual HIV serodiscordant couples. These constructs provided me with a framework for explaining the findings from the interviews. In addition to the *a priori* codes from the two theories, I remained open to the possibility of other codes and themes emerging from the data. Taken together, this approach helped me better understand the experiences and factors that influence a couple's decision to use PrEP as an HIV prevention tool. Findings from this research may help inform future research, policies, and inform prevention practices for heterosexual couples in HIV serodiscordant relationships. These implications will be addressed in the discussion and implications chapter.

Description of Sample

The sample for this study included 26 HIV serodiscordant heterosexual couples (52 individuals). The age range of the women in sample was 26-64 years (Average = 48 years), slightly younger than the men who ranged in age from 31-67 years (Average = 50.2 years). Racially, the sample consisted mostly of people who self-identified as Black/African American (77%, *n=40*), followed by Hispanic/Latino (17%, *n= 9*), and White (6%, *n= 3*). When asked about their level of educational attainment, 36.5% (*n= 19)* of participants had less than a high school diploma, 40.5% (*n= 21)* had a high school education, and 23% (*n= 12)* had either an Associate's or Bachelor's degree. Sixty percent of the couples in this study (*n = 17)* had a female partner living with HIV and an HIV negative male partner, while 40% (*n = 9)* of the couples consisted of a male partner living with HIV and an HIV negative female partner. Fifty-nine percent (*n* = 15) of the HIV negative partners in the study were using PrEP. Seven HIV negative men and 8 HIV negative women were using PrEP at the time of the study. Additionally, three men and one woman started PrEP after the study was completed. Three of the four had inconsistent PrEP adherence (two men, one woman).

The 26 couples in this study have been together for an average of 10 years (range 2-25 years). PrEP non-user couples had been together slightly longer (average 13 years, range 5-25 years) than PrEP user couples (average 9 years, range 2-25 years). As it relates to relationship status, half of the couples were married (*n =13)*. Four of the couples (7.6%) reported that they were currently trying to conceive a child.

Findings

While reading each interview transcript, I categorized responses as they related to the *a priori* codes. While I was open to the possibility of other codes and themes emerging from the data, the codes and themes that emerged fit well into the two theoretical models and I did not add any additional codes. Overall, there were five overarching themes from the Health Belief Model that manifested in participant interviews. Perceived threat, perceived barriers (concerns about side effects, fear/anxiety about taking medication, indifference about HIV transmission), perceived benefits, cues to action (partner protection, PrEP use as condom replacement, PrEP use due to concerns about condom efficacy), and relational efficacy emerged as the most salient themes that determined whether couples chose to use PrEP as an HIV prevention method. Two constructs from the Theory of Gender and Power, sexual division of power and cathexis also emerged as relevant factors that influenced the decision to use PrEP among these couples.

The Health Belief Model

The Health Belief Model was developed to better understand how to encourage people to engage in health promoting behaviors as well as to understand the failure of many health promotion programs aimed at change behavior (Champion & Skinner, 2008). Developed by social psychologists, the model proposes several constructs that may contribute to a person's ability or desire to take a health action. From this study, several constructs emerged as themes that help to frame and better understand the decision for HIV negative individuals in serodiscordant couple relationships to use or not use PrEP.

Perceived Threat

According to the Health Belief Model, perceived severity is the "belief about how serious a condition and its sequelae are." The model posits that people will be less likely to change risk behaviors if they believe that the disease is not severe, and if they believe that the benefits they receive from the risk behaviors outweigh the harm caused by the disease. Perceived susceptibility is the extent to which a person believes they are vulnerable to a disease or condition. The combination of these two factors represents the perceived threat of illness in individuals (Champion & Skinner, 2008).

Moderate or High Perceived Threat. Having moderate or high perceived threat was a common factor among the PrEP user couples. For example, 46-year-old Christina and 53-year-old Damien have been together for 22 years. Christina stated, "I wouldn't wanna put anyone's life in jeopardy like that, you know what I mean, like somebody did to me, you know?" For his part, Damien who is HIV negative saw his PrEP use as a way of ensuring longevity in their relationship. He said, "[We] used to hold each other, we would say 'we're going to die together.' I can't let her go through this by herself." Forty-three-year-old Lorie and her 46-year-old partner Arthur, who is living with HIV, have been together for 5 years. They both recounted that during their relationship, they have only had sex without a condom twice when they were trying to conceive a child. They now have a two-year-old daughter. When they met, Arthur told her immediately that he was living with HIV and conveyed, "if we do anything, we have to have protected sex. And she took that into consideration." When Lorie went to her appointment to receive her prescription for PrEP, she told the doctor,

> Let me explain something to you; I love this man, he loves me. He knows his health is what it is. He wants to make sure I'm still here, whether he's going to or not. Whether I'm still with him or not. He wants me to make sure I'm me, I'm whole.

Finally, Janine (32) and William (31) were expecting their first child. They had been together for two years. Janine discussed the fact that she was currently taking PrEP but would probably begin using condoms with her partner who is living with HIV after the birth of their baby so that she could discontinue PrEP and breastfeed the baby. Regarding taking her medication consistently, Janine recalled the story of how William encouraged her to use PrEP. She shared,

> He was very serious about it. He was *very* serious about it. He said listen, I love you, and if you love me, we going to talk about it, see what the situation is, and we going to go forward with it. He (left) the ball in my court. I'm like alright, let's do it.

When asked if she felt William had pushed her to use PrEP, she responded,

> No, I wouldn't say push, but he made a stand like this is a serious thing. "Playtime's over. Puppy love is over. This is serious. This is about your life, whether we are together or not, I want to make sure that you don't have it [HIV] at all." It made me feel like alright, if I'm worth, if I was the one worth him telling me this, it's worth me even taking it. You know?

Initially, when Janine and William became sexually active, he recalled that she didn't "sweat it" and had more of a "free spirit" attitude about his HIV status and her transmission risk. He said, "My girl never brings it up. I think she feels okay with it." He asked her, "You wanna catch this shit or something?" but Janine was unconcerned because he "takes care of himself" and his viral load is undetectable. But William was not as confident in the risk level. He shared, "Cause, you know, sometimes we don't use condoms. So, I was like constantly telling her, 'Yo, get this shit done [get a prescription for PrEP]."

Low Perceived Threat. Eleven individuals expressed feelings that the threat of HIV transmission in their relationship was low. Of these individuals, six were the HIV negative men who had chosen not to take PrEP, one was the only HIV negative woman who was not taking PrEP, and four were women living with HIV. Among the HIV negative men, there was a sense that because they had been with their partners for an extended period without becoming HIV positive and often without using condoms, they were not at elevated risk for HIV. Other contributing factors to this low perceived threat were that their partners said they were currently virally suppressed, that they were in monogamous relationships, and that it is more difficult to transmit HIV from a woman to a man.

Evan (38) and his partner Monique (51) have been together for 18 years. When asked why he did not feel he was at risk for HIV transmission, Evan responded, “Because I’ve been doing it – I mean, we’ve been having sex for so – thus far and I haven’t contracted it ever since then and I know I won’t contract it now.” Jack (56) and Tiffany (51) have been together for 17 years. When Jack’s partner Tiffany told him about PrEP he was not interested. He stated,

> She just told me about this whole thing that I could take to prevent me from getting it and I’m like, well, we’ve been married fourteen years already. I knew she was HIV positive before we got married, we might have used a condom maybe three times, four times in the last fourteen years, so…well, why am I going to start worrying about it now?

A few of the women living with HIV in the study also expressed some perceptions that they were not at elevated risk for transmitting HIV to their partners. Jennifer (55) stated, “I feel it wasn’t a risk because we always take the (HIV) test once a year to make sure he don’t get it.” Tiffany (51) felt that “it’s been so long, I figure if he was going to get it, he would have gotten by now.”

Some couples made a joint decision not to use PrEP because the partner living with HIV had an undetectable viral load. They believed that the threat of the HIV negative partner contracting HIV was low for this reason. Fifty-nine-year-old Maxine and 60-year-old David have been together for 19 years. Maxine’s thoughts are as follows:

> If I’m undetectable, they say he can’t get it and I told him, so he doesn’t want to use nothing. Not until he heard about this [PrEP] and he put on a condom, I’m like, ‘what’s going on now?” Why would it bother me after all these years?

> Maybe if I stopped taking my medicine and my viral load went up and I'm detectable, then I would worry.

David used condoms briefly when he first heard about PrEP. The knowledge about a prevention method seemed to temporarily increase his concern about HIV transmission. When asked if she would feel any relief if David decided to use PrEP, Maxine responded, "That's up to him, I don't care." David did not consider himself to be at risk for HIV and told the interviewer, "I only have one partner. I've only had one partner for the last 18 years, okay? I'm not an intravenous user and she's now undetectable." His low perceived susceptibility to HIV transmission and Maxine having an undetectable viral load may have been enough to make him feel safe continuing his long-term relationship her as it is.

Perceived Threat and PrEP Willingness. Having some sense of perceived threat among one or both partners lead to the HIV negative partner being open to using PrEP. It is important to note that a few of the couples who were not using PrEP during study participation, started using PrEP after the study. These couples include, John (50) and Candice (49), Joan (53) and Lawrence (46), Shana (50) and Marcus (54), and Molly (49) and Andre (48). Both John and Candice were interested in taking PrEP. Candice introduced the idea of using PrEP to her partner because she didn't "want him to feel like he's risking his life every time he has sex with (her)." She worked to convince him by asking him, "What if you ever caught something from me? I wouldn't feel right if you caught something from me." John eventually did go on PrEP, and stated, "Given what my wife has told me about it, I'm gonna consider taking it. So that's my final decision on taking this Truvada." Lawrence was undecided about taking PrEP at the time of his initial interview, but eventually did start taking PrEP. When discussing his hesitancy, he told the interviewer that he did not "have any extra sex partners outside of the relationship" and he was very confident that he would not become HIV positive because "her viral load is not detectable." He understood that "it's [HIV transmission] a lot harder from woman to man" and expressed that he knew and was willing to accept the risks of having unprotected sex with his partner Joan. He believed that he "got lucky" and he also stated, "I am gambling with my life every month that her and I have intimacy together when we don't wear protection." He said, "while we're in the middle of our intimacy, the virus does not pop into my head at all. I mean, I don't think about the fact that my wife is sick."

Shana was the only HIV negative female partner who was not on PrEP at the time of the study. She expressed that she was not afraid of contracting HIV from her partner. She shared, "I'm not afraid, just like I was telling [Marcus]. I'm not afraid...because to me, HIV is like another form of cancer. And it's just the only difference is it's transmitted from one person to the next." However, Shana did indicate that she might be willing to try PrEP because she understood that stress was not good for people living with HIV, and that the fear of transmitting HIV to her might be a source of stress for Marcus. She said, "I'm like, okay, what am I worried about? But then, I said, it's the stress part, that can make his level go up with that stress…" Although she believed that her taking PrEP might put Marcus more at ease, she did not see any personal benefit of taking PrEP. When asked by the interviewer if she believed PrEP would change her relationship with her partner Marcus in any way, she responded, "probably for the better maybe. Because of the less stress for him."

Molly and Andre have been together for 10 years. Molly found out about PrEP through participation in this study. She was surprised when she discovered that there was a way for her partner to protect himself from HIV transmission. She thought Truvada was a new medication for people living with HIV and was interested in learning more about PrEP for Andre. She stated, “I gotta protect myself from him (referring to potential STD transmission), he gotta protect himself from me.” Andre was interested in starting PrEP because according to him, “I do plan on staying with her…so this could be beneficial in more than one way to me.”

In summary, the level of perceived threat arose as a key factor that distinguished PrEP users from PrEP non-users in this study. Those who chose not to use PrEP were more likely have low perceived threat of HIV transmission for various reasons including comfort with their partner due the length of their sexual relationship, remaining HIV negative despite having unprotected sex with their partner living with HIV, perceptions about the difficulty of transmitting HIV from woman to man, being in a monogamous relationship, and comfort with their partners viral suppression. In contrast, while all the partners living with HIV in the PrEP user couples had undetectable viral loads, the individuals in these relationships still maintained a sense of risk of HIV transmission. This seemed to influence their decision to use PrEP, even when only one partner had moderate to high perceived susceptibility to HIV transmission.

Perceived Barriers

According to the Health Belief Model, perceived barriers are the “belief about the tangible and psychological costs of the advised action” (Champion & Skinner, 2008). Related to this study, perceived barriers refer to the real and perceived obstacles that

PrEP non-users had regarding PrEP use, as well as negative feelings about taking PrEP specifically, and medication in general. The barriers that emerged from the interviews from participants include concerns about side effects, fear/anxiety about taking medication, and indifference about HIV transmission.

Side effects. Both PrEP user and PrEP non-user couples expressed concerns about the potential side effects of PrEP. This concern is consistent with studies conducted among heterosexual women (Auerbach, Kinsky, Brown, & Charles, 2015; Corneli, Perry, McKenna, Agot, Ahmed, Taylor, et. al, 2016; Smith, Toledo, Smith, Adams, & Rothenberg, 2012; Walters, Platt, Anakaraonye, Golub, Cunningham, Norton, et al., 2021), heterosexual men (Smith, Toledo, Smith, Adams, & Rothenburg, 2012), MSM (Bauermeister, Meanley, Pingel, Soler, & Harper, 2013; Golub, Gamarel, Rendina, Surace, & Lelutiu-Weinberger, 2013; Mitchell, Lee, Woodyatt, Bauermeister, Sullivan, & Stephenson, 2016), and transgender women (Ogunbajo, Storholm, Ober, Bogart, Reback, Flynn, R., 2021; Pacífico de Carvalho, Mendicino, Cândido, Alecrim, & Menezes de Pádua, 2019) which have all found that one of the primary concerns about taking PrEP is the potential side effects of taking the medication.

Many of the HIV negative male PrEP non-users in this study expressed concerns about potential side effects of taking PrEP, contents of the drug, and potential interactions with other medications that they were already taking. John (50) who was a diabetic and used insulin shared, "I need to know what the effects will be cause …with insulin there's a different thing from the medication or pills." Calvin (55) shared his skepticism and stated, "I'm sitting here thinking like right now, what is this? What's in it? You know what I mean?" Cole (62) wondered, "I'm saying to myself, Truvada was given to patients and people with AIDS, now why do they want to give it to the people that's negative?" Marcus (54) expressed his concern of side effects and shared,

> … sometimes you have side effects…side effects can be worse than the pill. I know 'because I been through that. Side effects stuff. You may take a pill, you may have a big lump, or it make you have lumps on your body and stuff. Or you may take a pill and it gives you diarrhea. You got some pills you take and make your eyesight start getting bad.

Among the PrEP user couples, there were also concerns about side effects. Julia (29) had been with Payne (39) for two years. Julia told the story of when she first started PrEP:

> Well, in the beginning, it made me nauseous because sometimes, I really didn't know how it would make me feel, so I would take it without food. And then I started taking it with food. So, after about two or three weeks, it started feeling better, but in the beginning, it was like, urgh! And then I started feeling better after a while.

When asked about initial concerns, Brittany (54) stated, "side effects were one, taking so many pills because I also have a psychiatric diagnosis too, and I take medication for that, and it's just the idea of taking so much medication." Amani (61) was concerned that her partner Cameron (52) might experience side effects, "I think I was more concerned about whether or not he would have side effects, or something could happen to him as far as taking it, 'if it wasn't for me, you wouldn't be, you know?'" Her partner, Cameron shared her concerns, but decided that the pros outweighed the cons. He stated,

> I just was worried about the side effects. You know they give you the pros and the cons and I said, the worst-case scenario I get cramps and diarrhea. He [the doctor] said over time your body will get used to it. And which it did, I got cramps and a little diarrhea, but you have to take the pill. Once you start at a certain time you supposed to keep up with it.

Sheila (36) was also initially concerned about her partner Darren (35) taking PrEP. As expressed by Amani, Sheila felt a sense of responsibility for her partner having to take medication due to her HIV status. She disclosed, "I was a little worried, not that it was going to do anything bad to him, I trust science. [I was worried about] his outlook on it you know, 'look at this girl, now I've got to take medication for the rest of my life.'" Darren was also initially concerned:

> …that's probably the only thing that I was scared of that you know I might take it- might give me a different effect or something might happen to me, but then, the first month it didn't do nothing, so I was like okay but then I was happy. I was like at least now I know that I'm protecting myself.

A unique aspect of the interviews with the PrEP user couples was that, despite potential concerns about side effects, many of the participants talked about PrEP as reassurance and added protection that eased their anxiety about HIV transmission. For example, Cameron (52) stated, "Once the wife sat down and talked to me to reassure me of the situation or reason why I'm taking the pill, it put me at ease, you know?" He talked about PrEP as "like taking a vitamin." Darren (age) described PrEP as a way to "fight it from the inside out." Jermaine (48) even encouraged his partner Brittany (54) to take

PrEP by telling her about the potential side effects, because he was already on Truvada. He told her,

> Listen, I got occasional little redness, some rosacea or something. I said, side effects are minimal, it's not like taking AZT and you gonna turn black, and all of these kinda crazy things gonna happen to you. I mean it's different in everybody, side effects could happen, but if you're concerned, I have a whole print out of side effects from Truvada, you could go ahead and read them.

In summary, PrEP non-users and PrEP users expressed various concerns about the side effects of Truvada. The difference between the two groups is that PrEP users found a way to navigate around these concerns and see the positive benefits of using PrEP despite their reservations.

Fear/Anxiety about Medication. In addition to specific feelings related to side-effects of taking PrEP, PrEP non-user participants also expressed fear or anxiety about taking medication of any kind. Chris (55) emphasized, "I'm not taking that!' I haven't been taking no drugs, I'm not taking that." Cole (62) shared a similar sentiment and said, "First of all, I don't like taking medicine, I don't like medicine period, so that's what that was, what, medicine? No!" Evan (38) also expressed his dislike for pills and shared,

> Yeah, I don't take pills period. If I get a migraine, any illness, if I have to take Motrin or if I got to take a Tylenol, alright. Other than that, I'm not popping no pills. I don't like it. I can't stand it.

The PrEP regimen requires taking a pill every day at around the same time. because the study results highlight that fear/anxiety about taking medication can be a potential barrier for PrEP initiation. Fear/anxiety about taking medication has also been proven to interfere with medication adherence (Christudas, Gupta, Undela, Isaac, Ram, & Ramish, 2016; Gazerani, 2017; Hong, Kang, Yoon, Kang, Seong, & Kim, 2010). Fear/anxiety related to medicine use will need to be considered when trying to encourage PrEP use in high-risk populations.

Indifference about HIV transmission. One of the things that stood out from the interviews was that when couples described their relationships, many of them expressed that outside of the obvious impact of HIV on the health of the partner living with HIV, it did not have a significant impact on their relationship. HIV negative partners in both PrEP user and PrEP non-user couples conveyed an acceptance of their partners despite their HIV status, and some even discussed the idea that they did not consider their partners HIV status to be a big deal. In addition to this acceptance, several people in the study expressed an indifference about HIV transmission. For example, Chris (55) and Amber (62) have been together for 10 years. Amber has been living with HIV during the entire relationship. In the beginning, Chris was concerned about contracting HIV from Amber, but as the relationship progressed, he felt less anxiety about it. He stated,

> Well, during the heat of our relationship, at one time it didn't even bother me if I got it, you know what I mean? That's where my mind was at the time, that I didn't care. It was due to the fact that I know I wanted to be with her, right? And I know I loved her, and I didn't want to have sex with a condom. And at the time they had programs out and things to help people with HIV, so I was like, okay, if I get it then and I'm taking medication then we good, you know what I mean? After I learned more about it (HIV), and then I watched the progression from her with her pills, then it was, 'we can survive.'

Daniel (51) and Regina (41) have been together for 10 years. Regina expressed indifference about both HIV transmission and PrEP use stating "It's not a killer, it's like living with diabetes. You don't take the diabetes insulin, if you don't take the diabetes pills, your diabetes go up into a storm, you go into a coma of diabetes…So HIV is the same way." When asked whether she cared whether her partner took PrEP, she responded, "he's the one taking it, not me…". For his part, Daniel recalled being really scared when he first found out that Regina was living with HIV. He told interviewers, "Well, to be honest with you, I left [for] a couple of days and then I kind of realized, well, I'm gonna die anyways so what the hell? And I kind of just stayed because of that."

Lawrence is a 62-year-old HIV negative male was undecided about using PrEP. His partner, Joan (53), had been trying to convince him but he had not made the decision to start PrEP yet. She stated,

> I don't get mad [when he says he doesn't want to use PrEP, I just tell him, 'If that's the way you're going to protect yourself, then why not do it?' You know. Anything could happen. He just said, 'if something's meant for you, it's for you and there's no way of avoiding it.'

Finally, Shana (50), the only HIV negative female non-PrEP user, stated, "The job I do, I'm not fearful. So, it's not like, I was like, 'Oh, God!'. If I was fearful, I wouldn't have even thought about it having a sexual relationship with him."

In summary, distinct from low perceived threat, indifference about HIV transmission is a sense of resignation about either the inevitability or low significance of becoming HIV positive.

Perceived Benefits

According to the Health Belief Model, perceived benefits are the positive aspects of engaging in a new health behavior. When these positive attributes are perceived to outweigh possible negative impacts or when the benefits outweigh the barriers, people are more likely to engage in a new health behavior. Even though they had chosen not to use PrEP, when asked, there were some PrEP non-users who believed that PrEP could potentially have a positive impact on their relationship. John (50) shared that he knew that his partner, Candice (49) wanted him to start PrEP. According to him, she told him, "Try to take it 'cause this is for your side of the bed, to protect you because I have it [HIV]." He was open to taking PrEP and had done some research on potential side effects. He stated, "I'll take my part of this whenever I can! She takes her medication, her HIV medications, so there's no problem with that (taking PrEP)."

Some PrEP non-users also felt that taking PrEP might have a positive impact on their sex lives. Chris (55) shared that taking PrEP "will make her [his partner] much happier. It will make me much happier. I'll want to have sex more, that's for sure – because I do love her and I sleep with her every night, I'm affectionate you know, so I could probably have more sex." Daniel (51) and Regina (41) have been together for 10 years and reported that did not have sex very often. Regina stated, "he's worried when it comes to having sex. I see it that he's not in the mood…" Daniel wanted to start PrEP because he believed that he would want to have sex with Regina more often.

Among PrEP users, couples noticed positive impacts on their relationships after starting PrEP. Brittany (54) who is living with HIV stated, "it made it [sex] better because we feel more like, safe, safer now as far as the affection goes." William (31) was glad that his partner started PrEP. He "thought it was great, meaning I could have a sex life." Sheila (36), whose partner Darren (35) used PrEP, stated, "honestly, it's made us stronger. It has bonded us closer to each other."

In summary, both PrEP user and PrEP non-user couples, expressed perceived and actual benefits of PrEP use for their relationships. PrEP users felt that PrEP had enhanced their sex lives and the closeness that they experienced with their partners. The PrEP non-users who were considering PrEP did not have experiences of benefits but were actively considering the benefits that PrEP could have on their relationship and their sex lives.

Cues to Action

Cues to action are the stimuli that a person needs to encourage them to take a recommended health action. These cues can be internal (desire to protect partner) or external (pressure from partner or medical providers). In this study, three internal cues to action emerged. They were concerns about partner protection, PrEP as condom replacement, and PrEP due to concerns about condom efficacy.

Partner Protection. Many of the participants living with HIV in this study expressed feelings of concern that they might transmit HIV to their negative partners. Research indicates that concern about HIV transmission in serodiscordant relationships is a key factor in whether these couples use preventive measures such as condoms or PrEP (Beckerman, 2002; Starks, Gamarel, & Johnson, 2014; Ware, Wyatt, Haberer, Baeten, Kintu, Psaros, ... & Bangsberg, 2012). Among the participants in this study, there was a difference between PrEP user and PrEP non-user participants in that PrEP non-user participants expressed "concerns" about their health and/or their partners health while

PrEP user participants spoke more about "protecting" their own and/or their partners health.

When asked about their relationships and the factors that influenced how they approached sexual intimacy with their partners, individuals in PrEP non-user couples expressed concern about transmitting or contracting HIV. Monique (51) was concerned for her partner Evan's (38) health and was actively trying to convince him to use PrEP. She shared,

> I like the idea of having all things covered cause then I explain to him you never know with this disease, and you never know when something might change. You understand, this is a tricky disease and because I'm stable now doesn't always mean that I'll always be like this. What if something did change and something did happen? I wouldn't want to feel responsible. He was like, 'we good, we good.' That's the only thing that really annoys me about him is that 'we're good, we're good, we'll cross that bridge when we come to it.' I don't want to cross that bridge.

Despite her concerns for Evan, he was certain that he would not become HIV positive as a result of having sex with Monique. He said, "As long as I feel healthy, you know, my mindset is on staying positive about it, I'm good." Some couples had resorted to having less sex because of their concerns about HIV transmission. For example, when speaking about how she and her partner protect themselves from HIV transmission, Monique stated, "well, a lot of times we just abstain from sex."

In contrast to expressing concern about transmitting HIV to the HIV negative partner in PrEP non-user relationships, PrEP user couples spoke about a having a sense of protecting themselves and their partners. The distinction is a sense of active participation in the decision to prevent HIV transmission. When asked about why she decided to take PrEP, Lorie (43) said, “I’m not doing this just for me. I have five kids…I got to start something, I got to let them know, your mother cares.” Not only was Lorie protecting her own health, but she was also sending a message to her children that she would do whatever it takes prevent HIV transmission between herself and her partner. Her partner, Arthur (46) expressed similar concern. She recalled the story of when they went to the doctor together to get her prescription for PrEP, “…one of the doctors felt we were trying to get the medication because of him…he said, ‘no, I want it for her, cause no matter what happens at the end of the day, it’s her. I can die today or tomorrow, God forbid, she has to live.’” When she started taking PrEP he said, “I felt great! I felt great because she takes the medication!”

Brittany (54) reported feeling more of a sense of comfort since initiating PrEP, “Yeah. But it’s more like, you don’t have to be worrying, you know, the next time you get tested it’s going to be different.” Jermaine (48) was also excited when his partner started PrEP. He remembered thinking, “Wow! That’s great! Prophylaxis is a great idea, Condom is a prophylaxis, now you have prophylaxis that actually goes after the virus in case it gets in. This will eradicate it from the inside… wow, this is double protection.” He also told the interviewer that in addition to PrEP, he was taking his medication consistently and wearing condoms every time he and his partner had sex – “I protect my wife because I love my wife!” Michael (50) expressed similar sentiments about using PrEP as added protection for his partner,

> That [my partner taking PrEP] don't mean that you can have unprotected sex with her, you know what I'm saying, some people are like, "oh, I can have sex with my woman without using a condom". No. You can't do that! This is for your partner to prevent her from getting HIV, but you still got to have protected sex with your partner.

Tasha (50) reported feeling a sense of safety since initiating PrEP. She disclosed, "PrEP makes me feel safe. It makes me feel, I'm like at ease now." When discussing her relationship with her partner Lewis (50) who is living with HIV, Donna (40) stated, "if I'm going to stay with him, we gotta figure out a way that we both stay safe." She described PrEP as "added protection." It is important to her to take the medication for Lewis' peace of mind as well. She said,

> I guess he looks at me and he just says, "I've really put her in this situation." But that's something we talk about like, "you didn't put me in this situation, I mean you did, but I had the choice. Like I could have just walked away but I chose not to," you know what I mean? And I guess he starts getting a little depressed sometimes and like it'll hit him. If it makes him comfortable and he's protecting me at the same time, I'm fine with it. He was like, "if that's what you want to do," he was like, "you know, it's just an added protection for us," he was like, "it's a good idea."

William (31) wanted his pregnant partner, Janine (32) to begin using PrEP because, as he stated, "I felt guilty like I was doing something morally wrong, but she told me, "Don't worry about it," so why am I beating myself up about it if she's not?"

Despite this, William kept insisting that Janine start PrEP and felt that he was "very influential" in her decision to use it.

In summary, both user and non-user participants had concern for their own safety and the safety of their partners. The difference between the two groups is that while PrEP non-users simply expressed concerns, PrEP users seemed to have acted on their concerns by taking action and moving a step closer to having an added layer of protection against HIV transmission.

PrEP use as condom replacement. Darren (35) and his partner Sheila (36) have been together for five years and are currently trying to conceive. Sheila is living with HIV and reported that her partner started PrEP "for protection for him…because I couldn't be trying to have a baby without the medication." Darren also talked about other reasons for wanting to be on PrEP,

> Sometimes you love a person too much then you know you don't wanna be using the condom all the time 'cause you know you don't wanna make that person feel uncomfortable.

Damien (53) expressed wanting to feel a sense of intimacy with his partner Christina (46) in this way, "Sometimes…I would make love to her [without a condom], and she was like look, 'don't take chances like that!'" Christina in her interview shared that Damien had brought the idea of using PrEP to her because he wanted to have sex without condoms.

Payne (39) is living with HIV, and he and his partner Julia (29) have been together for two years. They decided in the beginning of their relationship that they didn't want to use condoms. According to Payne, "she didn't want to use condoms, and me neither, but I told her we need to do something," so Julia takes PrEP. Payne also shared that, "I don't use condoms. I went to two doctors, and they told me that works, if I'm taking my medication and she's taking her medication." Before Julia began taking PrEP things were not so easy. He recalled,

> She was like, she started crying, and she was like, you know, worrying for everything – what's the solution? But I went and took her to the doctor and the doctor said, "I see people that one got HIV, the other one no, you know? You can start taking these pills." He says 98% that you don't get infected, you know?

The concept of potentially using PrEP to decrease condom use was also discussed among PrEP non-user couples. John (50) and Candice (49) have been together for seven years and were not using condoms. She said, "condoms, don't feel right" but she still wanted to have some form of protection for John. For his part, John stated, "I love my life regardless, I love my wife…but even at the risk, I do it without a condom." John believed that if he started PrEP, he would feel safer having sex with his partner while still feeling the sense of connection he gets when he and Candice don't use condoms.

Chris (55) is HIV negative and said "love" was the reason he did not use condoms with his partner, Chris' partner, Amber (62), told interviewers that in the beginning of their relationship, she feared that Chris would cheat on her because he didn't like using condoms, but she insisted on using them. Eventually, Chris did cheat and had sex without condoms with several women. In his interview, he recounted,

> When I first was doing it [wearing condoms with Amber], it didn't bother me because that's all I was doing. But when we had a little breakup, and I was seeing other girls and I wasn't using a condom, I was like, 'Oh, wow! 'And when we got

> back together and it was just, it wasn't the same, you know what I mean? It was just, you know, the rubber dampens it.

Amber believed that if Chris was taking PrEP, then they could have sex without condoms and that if they had sex without condoms, Chris would not cheat and that their relationship, "would be more intimate."

Finally, Calvin and his partner Jennifer, both 55 years-old, have been together for 25 years. Calvin expressed in his interview that he was considering going on PrEP. He shared,

> To be honest with you, I was thinking that being that her viral load is the way it is, we're both getting older and she's getting sicker. I'm thinking that sometime in the future, her viral load might change. But then I didn't think there was an "out," you know? Other than condoms and I really can't use condoms. That would take our sex life away if I have to use condoms.

In summary, many participants were motivated to use or consider using PrEP because of a desire to decrease or discontinue condom use. Condoms were viewed as a barrier to intimacy and PrEP was viewed as a way to protect HIV negative partners from HIV transmission without the need to use condoms.

PrEP Use Due to Concerns about Condom Efficacy. Many of the PrEP using couples in this study expressed concerns about the efficacy of condoms and provided this concern as a reason for PrEP use. Arthur (46) shared that he and his partner, Lorie (43) decided to use PrEP "'cause even if the condom pops, we got back-up – the medication." Lorie felt that even though Arthur was undetectable, and they used condoms prior to her initiating PrEP, there was still a chance she could become HIV positive. When asked about this, she stated, “I know that it could happen, because even though he is undetectable, you know, it’s still there. It very well could be possible. Condoms break.”

Tanya (64) and Michael (50), a PrEP user couple, talked about an incident where a condom broke during a sexual encounter. After this incident, they decided that Tanya should start PrEP. Michael is living with HIV and recalled, “One time a condom broke. I was like, babe listen, don’t panic, don’t panic, just go to the toilet, go to the bathroom, and do what you got to do.” According to Tanya:

> The first time I went to get tested is when …he ejaculated in me. I jumped up and cleaned myself real quick. I had to wait for that waiting period and then [get tested]. I’m telling you; I wasn’t able to sleep well, eat, you know, and then afterwards it was like there’s nothing to worry about…

Donna (40) is also a PrEP user who started PrEP due to a broken condom during sex with her partner Lewis (50). According to her,

> We’ve always been safe, like we always use the condoms and everything like that, up until, I want to say in October. We had a very bad scare. The condom broke and he lost his mind. He was flipping out, so I went to [the hospital] to the Emergency room. They gave me all the pills. They gave me PEP and PrEP when I went to the ER.

Even though Donna is now on PrEP, she and Lewis still use condoms. Donna viewed PrEP as “added protection.”

Amani (61) says that when she first approached her partner Cameron (52) about using PrEP she explained it to him, “well, you know, you could still have sex and use condoms” and Cameron countered, “No, condoms break.” She said he was “very openminded" about taking PrEP and they saw it as "another form of protection…in case we didn't want to use a condom." When asked if he considered not using PrEP and just using condoms with Amani, he replied, "No, because if the condom break, this is double protection."

Darren (35) also expressed concerns about condom efficacy. He shared, "it's [PrEP] better for me cause like, even with a condom you could still get HIV, 'cause condoms eventually break, most of the condoms, they're not made to hold, they don't hold you know? Why don't you just take medication? It protects you from the inside and you don't have to worry about nothing breaking." Even though Darren had negative views about condoms, his partner, Christina (46) who is living with HIV said, "I still try to use condoms with him – we've tried it once or twice without it, and he's been tested; so far, he's okay. I'm still scared for him not to use a condom though."

Finally, Bobby (60) told interviewer that the fear of transmitting HIV to him was always in his partner, Kerry's (60) mind. He disclosed, "It's always in the back of her head. She said, 'I don't know how I would feel if it ever happened to you and then you have to go through what I'm going through,'" He said he was "curious" when he first heard about PrEP:

> I'm saying, so this is like [a pill] to protect you from the inside, like a condom on the inside, basically, because sometimes condoms are good, but sometimes they're not really safe, sometimes they can pop off, and she always used to tell me sometimes condoms can get stuck up inside you and you don't even know it.

In summary, couples in this study had several factors that served as cues to action to use PrEP. Research indicates that for many people, PrEP increases emotional and sexual intimacy, increases physical closeness and helps to decrease fear of HIV transmission (Curley, Rosen, Mistler, & Eaton, 2022; Grant & Koester, 2016; Underhill, 2015). Whether the couples were motivated to use PrEP to protect themselves or their partners, as a way to be safe without using condoms, or because of concerns about condom efficacy, all of these couples were seeking to create a sense of relationship and sexual safety. PrEP use was one way that they achieved this.

Relational Efficacy

In the Health Belief Model, self-efficacy is a person's belief that they can successfully engage in a health promoting behavior. In this study, the couples who chose to use PrEP demonstrated a unique form of *relational efficacy*. This form of self-efficacy is a unique construct that I found in this study. It is distinct from the construct in the Health Belief model because it is focused on the individual, whereas the construct that emerged in this study was focused on the couple. I define relational efficacy as the sense that people in a relationship feel better able to engage in a health promoting behavior because they have mutual support, accountability, and incentive to care for one another. Relational efficacy may result in improved closeness and intimacy. This relational efficacy was formed from a sense of comradery due to PrEP use. Because both people in the couple were taking medication regularly, they were able to support each other, and serve as accountability partners for one another. For example, Cameron (52) and Amani (61) shared that they took their medication together at the same time. Amani had an alarm that went off each day at noon. Cameron made jokes about different celebrities calling when her phone rang to remind them to take their medications. He said, "it breaks the tension but there’s no tension between ‘cause we know what it is. We ‘re both mature adults.”

Sheila (36) stated, “honestly, it made us stronger, like it’s bonded us closer to each other.” This is especially true for Sheila and her partner Darren (35) because prior to meeting him, Sheila was not taking medication. She was undetectable and didn’t have a committed partner, so she didn’t feel that she needed to be taking HIV medication. According to her, “I just got on the Complera because of him, because, I mean, my viral load is undetectable…like if in the future if something happens, I get sick really bad, I wouldn’t want to jeopardize his life.”

Before Damien (53) started PrEP, he felt a bit disconnected from his partner Christina (46) because Christina would go to HIV support groups and confide in the friends that she had made in the groups but didn’t talk to him about her HIV status very often. Since starting PrEP, Damien told Christina, “I’m starting to understand a little bit more of just, what you’re going through, you know? You don’t talk (about being HIV positive). (Now that I’m on PrEP) I think I understand more.” Damien said,

> I guess I was feeling a little bit left out, you know, not understanding her. I was a little jealous that she can go to them and this and that, but I guess I want to do this to show her that I want to be there for you, you know? I’m trying to understand, and this helped. I was like, wait a minute! This is like if I was HIV positive, I’d be taking that, you know?

Alexis (26) felt that her partner going on PrEP was a sign of her partner, Shawn’s (26) commitment to the relationship:

> For me, it showed me that he is really invested in his relationship, that it's not just like, okay, "I'm going to leave you someday," kind of thing. It really showed me that he's on board for helping me and for helping him so that we can stay at our positive/negative aspect of the disease, and he's invested in whatever he can do to help himself or help me feeling comfortable with living with this disease.

Finally, Olivia (51) recalled her partner Brian (47) being excited when she introduced him to PrEP, "he was happy, they gave them to him and everything." Brian was happy because according to him, he felt, "we both protected, you know? It's better than letting just one be protected."

Relational efficacy emerged as an important contributor to couples using PrEP. Having the support of a partner increased confidence in the ability to take the medication and fostered a sense of closeness and comradery in the relationship. PrEP user couples took medication together to hold one another accountable, HIV negative partners believed they gained a better understanding of their partners living with HIV and felt that PrEP use was a sign of commitment to the relationship.

The Theory of Gender and Power

The Theory of Gender and Power (Connell, 1987) posits that there are three factors which influence women's social inequities. These factors are sexual division of labor, sexual division of power, and cathexis. In this study, sexual division of power and cathexis emerged as the main themes that influenced a couple's decision to use PrEP. These constructs will be discussed below to demonstrate how these factors place women *and* men at increased risk for HIV transmission and PrEP use/PrEP non-use.

Sexual Division of Power

As it relates to sexual and reproductive health in heterosexual relationships, the construct of the sexual division of power refers to relational power imbalances that result in little or no communication about sex, poor perceived or actual control over the negotiation of safer sex, disapproval of safer sex practices, poor assertive communication skills, and/or physical violence (DiClimente, Wingood, Crosby, Sionean, Brown & Rothbaum, 2001; Wingood & DiClimente, 1998). Sexual division of power in this sample manifests largely through some of the female partners' history with physical and sexual violence and the impact that this history had on their ability to navigate their current relationships. Female participants discussed communication issues with their current partners, and male disapproval of safer sex practices, including condom use and PrEP initiation. The accounts below demonstrate how the sexual division of power can impact the decision to use PrEP in heterosexual serodiscordant relationships as well as how PrEP can be a viable option for HIV negative women in serodiscordant relationships to protect themselves from HIV transmission when other protective measures are difficult to negotiate.

Evan (38) did not want to use condoms and had also decided not to use PrEP despite his HIV positive partner, Monique's (51), concerns. Monique had asked him repeatedly to consider using PrEP and was not sure why Evan was against it. She stated,

> I really just wish he would say yes, you know? I love him and would never want anything to happen to him. Nothing. And by my hand, you know? And that's something that's so avoidable, even though we have been good for 15 years. It has been a whole 15 years, why push your luck?

She also added,

> Yeah, I was pissed because I'm like come on it's just a pill… I kind of felt isolated in this disease. Like you're not seeing it from where I'm sitting and maybe if you took a pill, you could see it from where I sit. That it's nothing but a pill, you know what I'm saying? I'm taking all this medication and it keeps me where I'm at. It keeps me stable. You got to understand it would do the same for you. You never ever have to worry about getting this disease. If you just pop one pill a day. Never have to worry about it, and I don't have to worry about it. My conscience won't have to be eating me up as far as anything happening to you.

Evan provided several reasons for not wanting to take PrEP including fear of taking medication, the length of his relationship with Monique without becoming HIV positive, and a concern that Monique suggesting that he should use PrEP signified infidelity in the relationship,

> Evan: You got something to hide from me? I started thinking, I get to thinking please don't let this happen. I'll be like well why do I got to get on this, why I got to start taking it? We've being having sex for this long. I haven't been positive now, why all of a sudden do I got to get on this shit? Because, you know- you've been around with other men? These are the questions that's going in the back of my head.
>
> Interviewer: Well, what would that have to do with anything? I mean she's affected, right?
>
> Evan: Right, exactly. But you know…when you start to deal with other folks you don't know what they got then they're saying this this and that- I don't know.

Linda (43) and Andrew (53) have been together for five years. Andrew did not disclose his HIV status to her. In fact, a year into their relationship, Linda found out her partner was living with HIV when she found paperwork for a program for people living with HIV. When she confronted Andrew, he admitted to her that he was living with HIV. Since then, Linda, "doesn't trust him anymore." She said that his lack of disclosure signified to her "that he didn't give a shit. Because if he did, he would have said something." She shared that when she approached him about using condoms he told her, "Oh we ain't been using no condom and you don't wanna use a condom." When she told him about PrEP, she says he told her he wanted to sell her medication.

Despite these incidents, Linda stayed with Andrew because "he needed her". Both Linda Andrew struggle with drug addiction and according to Linda, Andrew often doesn't pay the bills. Currently, they are facing eviction because the rent has not been paid. Linda told interviewers that she only uses drugs intermittently and is waiting for her partner to be accepted into a program that will pay his bills and give him a monthly stipend. After this, she plans to sneak away and enter a drug treatment program that offers job training and other services. She told interviewers, "Maybe after I leave him, I'll be happy again." By Linda's account, she had tried to leave several times but when she did, Andrew would block her in the house and hide her bag with her important papers and pictures of her children in it. He knows she won't leave without these essential items. Linda told interviewers that she changed bags and kept a "decoy bag" hidden in their closet.

Linda and Andrew's story is a classic example of how the construct of sexual division of power impacts women's ability to protect themselves from HIV transmission.

Linda is in a relationship that she is struggling to leave. While Andrew says he is virally suppressed, he does not take his medication consistently, does not want to use condoms, and has tried to encourage her to sell her Truvada. In Linda's case, having access to PrEP is crucial for her protection from HIV transmission because her partner is inconsistent in taking his HIV medication and condom negotiation with him has been difficult. Perrson & Richards (2008) have presented the concept of "proxy negativity" in which men living with HIV seek relationships with HIV negative women as a way of regaining their desirability as men, specifically heterosexual men, as HIV is often associated with homosexuality or lack of masculinity. They also assert that while the women in these relationships are vulnerable, the men are also vulnerable because of societal expectations of how they perform gender which likely contributed to them contracting HIV in the first place.

Jennifer contracted HIV from her ex-husband who was abusive. She met him when she was 15 years old. She shared that he was nice at first but soon started beating her regularly. She recounted: "I was young, and he took my virginity from me. He beat my ass, he treated me like a slave, stepped on me, made me lay on the floor, burnt me with cigarettes. He tortured me, you know, until I got tired of being tired and I started fighting back." She recalled the story of the beating that caused her to start fighting back and shared,

> He was holding on tight, and I could feel my life getting ready to go out my body… [I said], "please, Lord, don't let this man kill me." Then after I got myself together, it was fight central; every time he touched, me, we was, pow, pow, pow, pow, pow! And look, don't touch me! Nothing happening no more; you got my

kids taken. And here you want to use me; I said then why did you marry me- ‘cause I’m your property?

Jennifer’s experiences with intimate partner violence in the past might be impacting her ability to negotiate safer sex practices in her relationship with Calvin (55). Sexual division of power plays a significant role in the ability of women to negotiate safer sex with their partners. Research also indicates that women who have had past experiences with intimate partner violence might be less likely to attempt to negotiate safer sex with current partners (Conroy, 2020; Maman, Sweat, & Gielen, 2000; Wingood & DiClemente, 1997). Jennifer reported that she was hesitant to pressure Calvin to use PrEP. When asked about talking to Calvin about PrEP, she stated, “So you can’t push a man over the limits. You gotta just put it out there, hoping that maybe he’ll get it.” When interviewers asked Calvin why he thought Jennifer didn’t press him more he replied, “I think it’s because I said, ‘I’m not taking that! I haven’t been taking no drugs, I’m not taking that!”. Despite this reaction, Calvin said that he would be willing to consider taking PrEP if Jennifer “pushed the issue”. So, Jennifer is in a precarious situation where past relationships have conditioned her not to “push a man over the limits.” Meanwhile, her partner is expecting her to do the labor of pushing him to use PrEP, even though PrEP use would be for his own protection.

The accounts above are an example of how the construct of sexual division of power impacts women’s ability to protect themselves from HIV transmission. Linda is struggling to leave a man who says that he is virally suppressed, but who does not take his medication, does not want to use condoms, and has tried to encourage her to sell her PrEP. Monique’s partner implies that her desire for him to use PrEP is a sign of infidelity, and Jennifer is in a relationship where she is expected to “push” or “convince” her partner to use PrEP for his own protection. There is some research that demonstrates that cultural expectations of masculinity including not demonstrating vulnerability (and thus not acknowledging being “at risk” for HIV transmission) and hypersexuality may cause some men to reject safer sex practices (Orengo-Aguayo & Perez-Jimenez, 2009; Reis & Gir, 2009). Other research posits that to better understand risk-taking in HIV serodiscordant relationships, we also need to understand the complexity of those relationships beyond considerations of risk (Persson, 2013; Persson, Ellard, & Newman, 2016; Persson & Richards, 2008). For example, stigma, cultural norms and expectations surrounding masculinity (as discussed above), and relationship security being more important than sexual safety can influence how couples decide to contextualize and handle HIV transmission risk in their relationships. These factors should be considered in any discussion about the negotiation of PrEP use, particularly in heterosexual serodiscordant relationships where power imbalances are present and have the potential to impact these decisions.

Cathexis

Cathexis is about affective attachments and social norms and the impact that these factors have on romantic relationships. As it relates to HIV prevention, this refers to things like the desire to conceive, family influence, conservative cultural and gender norms, and conservative religious beliefs and practices. In this study, cathexis manifested mainly as conservative cultural and gender norms and the desire to conceive. These norms served not only to place HIV negative women at risk for HIV transmission, but also made men vulnerable through the performance of masculine gender norms that normalize risk taking. These concepts were demonstrated in the stories of Arthur (43) and Lorie (46), Heather (43) and George (46), and Jennifer (55) and Calvin (55).

Arthur and Lorie have been together for 5 years and Lorie is on PrEP. Lorie takes her medication regularly but says that it is not so easy to get Arthur to remain consistent with his medications. He is, by his own account, combative at times and has tried to flush his medication down the toilet. When Lorie tries to stop him, he often fights her and gets angry at her for trying to make him take his medication. He stated,

> I may push her, and she may fall on the floor, you know, I may push her, and she hit the wall and I may push her, and she fall off the bed, and I tell her, "Yo! Don't ever touch my hand. If I go dump this shit out, let me go dump this shit out. The fuck away from me! Obviously, you don't give a fuck 'cause you got me going through this shit!" You know what I mean?

Because of his violent resistance, Lorie has resorted to crushing Arthur's medication in his food. She says she's "slick" and sneaks his medication in hits food: "Oh! You don't want to take your pills? The pestle and mortar, crushing them up, dump them in his juice, sprinkle them in his food. I found tricks to get him to take his meds." She says, "I mean, I feel bad, I'm like, I got to blackmail you to take your medication? So be it." While she may believe that she is "sneaking" Arthur his medication, he told interviewers he knows that she is doing it:

> You know? You know but she is wonderful, man, and I thank God because sometimes I don't want to take my medication. I'm going to tell you what she does; she'll say "Well you want me to heat something up? You hungry?" And I say, "Yeah." You know. So, I've seen her with my pill bottle, like yo, what you

doing? She's like "Oh I'm just putting them up." You know what I mean? But she's taking the medication and she'll go to the bathroom, and she'll crush it up.

Arthur shared that Lorie "knows her boundaries" but also "knows how to push his buttons. He has also told her, "You don't tell me what to do. You know I wear the pants, you got pants on too, but you know I regulate." Lorie resorting to crushing Arthur's medication in his food is a strategy to keep herself and her partner healthy while avoiding the violence that ensues when she tries to do this overtly. It also allows Arthur to maintain the façade of being in control of the situation while pretending not to know that his partner is "tricking" him into taking his medication and achieving the outcome she wanted to achieve in the first place.

Arthur and Lorie's story is an example of how the sexual division of power and cathexis do not occur in isolation. The violence that Arthur exhibits when Lorie tries to encourage him to take his medication is an example of sexual division of power. Lorie's response to Arthur's violence is to find ways to navigate circumvent it. This reinforces gender norms like women acting as the caregivers of their partners, and men resisting vulnerability and self-care (cathexis).

Heather has also had trouble getting her partner to take HIV prevention into his own hands. She disclosed her status to him when they met 7 years ago and her partner George, still does not want to use condoms. According to her, "I be thinking, I'm like, I hope he don't come out positive. Then I'm gonna feel guilty, you know what I'm saying. Even though I told him – why should I feel guilty even though I told him from day one, I was positive? That's why he said he's not going to be mad at me 'cause I told him." She has tried to convince him that he should be using condoms, I said, "What you want me to do?" I said, "You don't want to use condoms!" I've been talking to him about using condoms but he don't want to use them. She (her doctor) said, well you know you can't force him to use them. If he don't want to use them, you know, but I'm going to put him on this Truvada, that's what she told me.

Jennifer (55) has been with her partner Calvin (55) for 25 years. She shared that they had a good relationship and that she had been trying to convince Calvin to start taking PrEP. Calvin was hesitant about taking PrEP. He also felt that seeing female medical providers was not helping him. He said,

I don't know. It's like every time I get a doctor it's always a woman. It's never a guy and you don't feel so open when you're a guy… I'd be more open if it was a guy, but they just don't give me guy doctors.

Calvin's concern with only having female medical providers reflects cathexis because it demonstrates how cultural and gender norm expectations might influence health-related decisions. This account highlights how some people may not only prefer to communicate with same gender physician's regarding sensitive health issues (Yanikkerem, Özdemir, Bingol, Tatar, & Karadeniz, 2009), but also that gender of the provider may impact whether the man is willing to express the need for a medical intervention or comply with the recommendations of medical providers.

In summary, the constructs within the Theory of Gender and Power play a key role in HIV transmission risk among the couples in this study. The main ways are violent relationship histories that contribute to current relationship dynamics and, relationship factors that make it difficult for HIV negative women to protect themselves as well as for women living with HIV to convince their partners to protect themselves. It would be easy to dismiss this as vulnerability and oppression of women, and the recklessness of men, but many of the couples weighed the risks of HIV transmission and decided to move forward, often as a demonstration love and commitment. The next chapter will further discuss the results and provide some implications and suggestions for future research and interventions.

Chapter V: Discussion and Implications

This study explored factors that influence the uptake of pre-exposure prophylaxis (PrEP) among heterosexual HIV serodiscordant couples. Two theories were chosen to inform this study: 1) the Health Belief Model (Champion & Skinner, 2008), and 2) the Theory of Gender and Power (Wingood & DiClimente, 2002). To examine this question, I analyzed data from qualitative interviews with 26 HIV serodiscordant couples. This process yielded themes in seven categories from the two theoretical models. The level of perceived threat emerged as a key factor in whether couples chose to use PrEP. In addition, perceived barriers (concerns about side effects, fear/anxiety about taking medication, and indifference about HIV transmission), perceived benefits (increased physical and emotional intimacy), cues to action (partner protection, PrEP use as condom replacement, and PrEP use due to concerns about condom efficacy), and relational efficacy were salient themes from the Health Belief model. From the Theory of Gender and Power, sexual division of power and cathexis were the most prominent themes. These findings and their implications for future research and interventions will be discussed in this chapter.

Health Belief Model

Perceived Threat

Studies have found that having a low perceived threat of HIV transmission is associated with low PrEP uptake among people who inject drugs (PWID) (Biello, Bazzi, Mimiaga, Biancarelli, Edeza, Salhaney & Drainoni, 2018; Felsher, Szep, Krakower, Martinez-Donate, Tran, & Roth, 2018) and men who have sex with men (MSM) (Chan, Glynn, Oldenburg, Montgomery, Robinette, Almonte, & Nunn, 2016; Young, Flowers, & McDade, 2014). The results from this study support these findings. HIV negative and people living with HIV who indicated in their interviews that the perceived threat of HIV transmission in their relationship was low, were often not using PrEP or requesting their partners to use PrEP, respectively. Participants had many reasons for believing that the threat of transmission was low including the length of their relationship, perceptions about the difficulty of transmitting HIV from woman to man, and comfort with their partners viral suppression.

Length of Relationship

Couples in this study had been together for an average of 10 years (range 2-25 years). PrEP user couples had been together for an average of 9 years (range 2-25 years), while PrEP non-user couples had been together slightly longer (13 years, range 5-25 years). The duration of the relationship was often cited as the reason for low-risk perception and non-PrEP use. All the partners living with HIV in this study had been HIV positive from the beginning of their relationships. Their HIV negative partners felt a sense of safety because they had been with their partners for so long without becoming HIV positive and believed that if they were going to contract HIV, it would have already occurred. There is some evidence to support that couples gain a sense of confidence that HIV will not be transmitted to the HIV negative partners as they gain trust in the relationship through increased length of the relationship (Persson & Richards, 2008). Some participants in this study felt no need to change their relationships by initiating PrEP because their current strategies had been effective in preventing HIV transmission up to this point. They didn’t want to disrupt the established norms in their relationship and felt certain that they could maintain their serodifference.

Given the results of this and other studies, some couples in long term relationships may not feel the need to use PrEP for HIV prevention, researchers and practitioners need to develop ways to motivate these couples to initiate PrEP. One thing that researchers may consider is to adapt existing couples-based interventions to encourage PrEP. Couples-based interventions have been shown to be more effective than individual interventions because they focus on relationship factors and building skills as a couple (Arden-Close & McGrath, 2017; Berry, Davies, & Dempster, 2017). Results of a meta-analysis showed that couples-based interventions had statistically significant increases in protective sex, uptake of HIV medications and HIV testing (Crepaz, Tungol-Ashmon, Voshburgh, Baack, & Mullins, 2015). There are some couples-based interventions specifically focused on PrEP uptake and uptake and adherence. The Partners PrEP study which was conducted with heterosexual mixed status couples in Uganda offered adherence counseling for couples taking PrEP. This counseling increased PrEP adherence among couples from 75.7% to 84.1% (Psaros, Haberer, Katabira, Ronald, Tumweigye, Campbell…& Safren, 2014). The Magnetic Couples Study (McMahon, Simmons, Haberer, Mannheimer, Leblanc, Torres…& Anderson, 2021), is underway and will focus on identifying "determinants at multiple level of PrEP outcomes along the care continuum (PrEP awareness, linkage, uptake, retention and medication adherence)" in heterosexual serodiscordant couples. This study has the potential to inform effective couples-based interventions that will increase PrEP uptake in mixed status couples. The It Takes Two intervention is focused on transgender women and their partners (Gamarel, Sevelius, Neilands, Kaplan, Johnson, Nemoto…& Operario, 2020). The purpose is to reduce sexual risk behaviors and increase PrEP uptake. It is currently being tested in randomized controlled trials. If effective, this is intervention could be adapted for mixed status heterosexual couples. Because there is currently such a small number of evidence-based, PrEP-focused, couples-based intervention researchers and program managers may want to consider developing or adapting HIV interventions to focus on PrEP uptake, specifically for couples in long term relationships. This may encourage PrEP use by increasing acceptability, uptake, adherence and communication about PrEP, as several studies have increased these factors in other areas of HIV prevention (Jiwatram-Negron & El-Bassel, 2014).

Female to Male Transmission

Three of the HIV negative men in the study mentioned not being concerned about contracting HIV because they believed that it was more difficult to transmit from woman to man. There is evidence to support that due to biology, it is easier for women to contract HIV from male partners (Baeten, Richardson, Lavreys, Rakwar, Mandaliya, Bwayo, & Kreiss, 2005; Nicolosi, Leite, Musicco, Arici, Gavazzeni, & Lazzarin, 1994; Shaw & Hunter, 2012). Studies have shown that the risk of transmission is twice as high for male to female transmission (Baggaley, White, Hollingsworth, & Boily, 2013; Boily, Baggaley, Wang, Masse, White, Hayes & Alary, 2008; Scully, 2018). The males who expressed this sentiment are correct in their understanding that they are at lower risk for HIV transmission than their female counterparts. However, it also needs to be conveyed that lower risk doesn't mean that there is an absence of risk. HIV negative men in serodiscordant relationships need to be provided with accurate information and resources to help them better understand and weigh the risks of unprotected sexual intercourse with their partners living with HIV. While this improved assessment of risk may or may not lead to increased PrEP use, providers can encourage more frequent testing and assessment of their partners viral loads to ensure that the risk of HIV transmission is minimized.

Viral Suppression

All the participants living with HIV in this study self-reported that they were virally suppressed. While I could not corroborate their self-reported viral suppression with reports from the laboratory, this was cited by both PrEP users and non-PrEP user couples as a reason that the perception of risk for HIV transmission was low. This finding highlights the need to help individuals in serodiscordant couples to contextualize their risk for HIV transmission. According to the most recent US Public Health Service Clinical Practice Guidelines, clinicians should discuss PrEP with these couples and prescribe PrEP, if requested (2021). While the HIV negative partners in these couples have been categorized as high risk because of their partners HIV positive status, the CDC states that “A person with HIV who takes HIV medicine as prescribed and gets and stays virally suppressed or undetectable can stay healthy and has effectively no risk of sexually transmitting HIV to HIV-negative partners.” (CDC, 2022). This means that the couples in this study may not be wrong in their perception that they are not at high risk for HIV transmission if the partner living with HIV maintains viral suppression. It should be noted, however that even short lapses in anti-retroviral therapy (ART) for people living with HIV can lead to medication resistance and increases in viral load. Because some of the couples in this study reported that they or their partner took their HIV medication inconsistently, education and awareness about the importance of PrEP will be helpful for these couples as they navigate HIV in their relationships. It can help them understand that

PrEP is a potential tool that they can use if their partners viral load becomes detectable, if they want to conceive a child, or for added protection.

Perceived Barriers

The Health Belief Model posits that people who perceive more barriers to starting new health promoting behaviors will be less likely to begin that behavior than those who perceive fewer barriers. When trying to promote a new program or intervention such as PrEP, it is important to assess the barriers that people may face and find ways to address them. The PrEP non-user couples in this study had three main barriers to PrEP use. They shared concerns about side effects, fear/anxiety about mediation, and indifference about HIV transmission. Understanding these barriers may be helpful in promoting PrEP use in heterosexual serodiscordant couples.

Concerns about Side Effects

There are some documented side effects of daily PrEP use. They are abdominal pain, nausea, vomiting, and diarrhea. There is also the potential for long-term effects such as kidney and liver damage (Mayer, Agwu, & Malebranche, 2020; Tetteh, Yankey, Nartey, Lartey, Leufkens, & Dodoo, 2017; van der Straten, Stadler, Montgomery, Hartmaan, Magazi, Mathebala, & Soto-Torres, 2014). Doctors screen potential PrEP users for kidney and liver disease and should perform regular check-ups to assess these potential long-term effects. Despite the potential for side effects, Truvada has a good safety profile and is well-tolerated by most people (Mugwanya & Baeten, 2016). Research has shown that people who have concerns about side effects are less likely to be willing to take PrEP (Hu, Zhang, Peng, Zhang, Liang, Dai, & Huang, 2018; Patrick, Jain, Harvey-Vera, Semple, Rangel, Patterson, & Pine, 2019). Several of the participants in this study cited concerns about the side effects of PrEP as a barrier to PrEP use. Participants were uncertain about how their bodies would react to the medication and/or how it might interact with other medications they were taking. Preparing clinicians who might prescribe PrEP to have open and honest discussions about potential side effects and how to manage them and having supportive resources for people taking PrEP will be an important step in allaying concerns about medication side effects and increasing PrEP uptake among those for whom this is a primary concern. Some studies suggest that training providers to educate patients about PrEP and making discussions about PrEP routine may help to reduce some of the concerns that people have about PrEP side effects (Calabrese, Krakower, & Mayer, 2017; Tekeste, Hull, Dovidio, Safon, Blackstock, Taggart, & Calabrese, 2019). In a study about how to frame messages about PrEP efficacy and potential side effects, MSM reported that they preferred success-framed messages that emphasize the effectiveness of PrEP. They reported that they wanted messaging to contain visual aids to help them understand statistics and percentages regarding medication safety and effectiveness (Underhill, Morrow, Colleran, Calabrese, Operario, Salovey, & Mayer, 2016). While more research will need to be done on heterosexual couples to better understand the messages that will resonate with this audience, health literacy professionals can begin with this information and build upon it to create messages that will be effective in allaying fear and concern about side effects and addressing this potential barrier to PrEP uptake.

Fear/Anxiety about Medication

Some of the HIV negative male PrEP non-users expressed fear/anxiety about taking any type of medication and cited this concern as the reason they did not want to take PrEP. While this phenomenon has not been studied specifically regarding PrEP, there are studies of this phenomenon in other populations including people with diabetes (Shiyanbola, Brown, & Ward, 2018), heart disease (Khan, Shah, & Hameed, 2014) and psychiatric diagnoses (deLeon & De las Cuevas, 2017). These studies recommended the development of specific interventions that address the fear and anxiety about taking medication. Participants in one of the studies (Shiyanbola, Brown, & Ward, 2018) indicated that they wanted health care providers and faith leaders to be educated to provide counseling about the importance of taking medication and the consequences of non-adherence. Further study is needed to determine whether this is a persistent barrier to PrEP use among heterosexual serodiscordant couples and other populations and apply what is known about fear and anxiety about taking other medications to a new understanding of how to address this and remove it as a barrier to PrEP use.

Indifference about HIV Transmission

Many of the participants in this study expressed a sense of indifference about becoming HIV positive. Among participants who expressed this sentiment, there was a sense that HIV was a manageable chronic condition that would not significantly change their lives if they were to contract it. Among MSM, researchers have identified the concept of treatment optimism (Chen, 2013; Prestage, Down, Bradley, McCann, Brown, Jin, & Hurley, 2012; Macapagal, Birkett, Janulis, Garofalo, & Mustanski, 2017; Rowniak, 2009). Treatment optimism is the decreased perceived seriousness and concern about HIV transmission because of the availability of effective treatment options for HIV. It is one of the most common hypotheses used to explain increased risky sexual behavior among MSM. In this sample, it seems that some participants may be experiencing a sense of treatment optimism which contributes to a sense of indifference about contracting HIV.

Felsher, et al. (2018) had similar results as the ones in this study. Using in-depth interviews with 35 heterosexual individuals, they found that among those who had low perceived threat of HIV transmission, there was a sense of indifference about HIV transmission. While this phenomenon has been studied among MSM, further study is needed among heterosexual individuals and couples to determine the role that indifference about HIV transmission might play in PrEP uptake in particular, and sexual risk-taking in general. Researchers who have studied treatment optimism in MSM have shown that balancing messages about the effectiveness of HIV treatments with messages about HIV transmission risk, providing more frequent testing and counseling, and intensifying messages about the importance of safer sex have reduced optimism among this population (Hanif, Bastos, Malta, Bertoni, Winch, & Kerrigan, 2014; Levy, Phillips, Magnus, Kuo, Beauchamp, Emel, & Mayer, 2017, Peterson, Miner, Brennan, & Rossier, 2012). Researchers can build upon this knowledge to develop interventions targeting indifference about HIV transmission among heterosexual serodiscordant couples.

Perceived Benefits

The main benefit that couples felt did or could come from PrEP use was improvement in sexual intimacy. Several PrEP users reported increased frequency and enjoyment of sexual intercourse. PrEP non-users believed that PrEP use could increase the frequency of sex in their relationship. While PrEP non-users did indicate that they saw some potential benefit of using PrEP, there is evidence that these perceived benefits may not be enough to convince non-PrEP users to begin PrEP (Felsher, Szep, Krakower, Martinez-Donate, Tran, & Roth, 2018). Research indicates that among MSM, perceived benefits were not enough to overcome perceived or actual barriers such as lack of insurance, logistical barriers such as not having access to providers who will prescribe PrEP, and stigma, and (Auerbach, Kinksky, Brown, & Charles, 2015; Felsher, Szep, Krakower, Martinez-Donate, Tran, & Roth, 2018). Only one couple who discussed the potential benefits of using PrEP started using PrEP after the completion of the study. This information is a clear indication for researchers and practitioners that while understanding that there may be benefits to using PrEP, interventions need to focus on reducing barriers to PrEP access to truly increase PrEP use. Also, providers need to help people navigate their perceived and experienced barriers to help those who believe that PrEP might be beneficial to actually access it.

Cues to Action

Cues to action are those events or phenomena that prompt a person to adopt a health behavior. Among the participants in this study, the most prevalent cues to action were desire to protect partners, PrEP use as condom replacement, and PrEP use due to concerns about condom efficacy.

Protection. The desire for individuals living with HIV to protect their HIV negative partners is one of the main reasons cited for PrEP use by serodiscordant couples (Ngure, Heffron, Curran, Vusha, Ngutu, Mugo, & Baeten, 2016; Starks, Doyle, Shalhov, John, & Parsons, 2019; Ware, Wyatt, Haberer, Baeten, Kintu, Psaros, & Bangsberg, 2012). In these studies, the HIV negative PrEP using partners also indicated that they were taking PrEP to protect themselves and to feel a sense of safety in their relationship. Participants in the present study expressed this sentiment as well. This finding underscores the fact that for people who are in HIV serodiscordant relationships, the decision to take PrEP may be a joint one. In fact, the final decision may be made in part because of the concern of the partner living with HIV.

An important distinction that was found between PrEP user and PrEP non-user couples was that rather than taking action to protect their partners, PrEP non-users expressed concern for their partners well-being, but didn't take the extra step to begin PrEP use. As providers work to promote PrEP use, they need to be sure to assess the relationship status of their patients and assess whether there is concern on the part of either partner about HIV transmission. They may also need to develop assessment tools based Prochaska's Stages of Change model (Prochaska & Norcross, 2001) to determine what cues to action are present and what stage of readiness people may be in. For example, those in the precontemplation phase will need to be educated about their personal risk for HIV transmission and given support in understanding the need for PrEP use in their relationship. Those in the contemplation phase can be given the pros and cons of PrEP use and assessed for their perceived benefits vs. their perceived barriers. Providers can then help to magnify risks and navigate barriers. In the preparation phase, individuals can be given support in obtaining a PrEP prescription and provided with tools to support them in the action and maintenance phases. This is just one example of how understanding cues to action can help to encourage and support PrEP use.

PrEP Use as Condom Replacement. There is some research that indicates that couples use PrEP in the place of condoms to increase intimacy (Adams & Neville, 2009; Golub, Starks, Payton, & Parsons, 2012) and to achieve safer conception (Bazzi, Leech, Biancarelli, Sullivan, & Drainoni, 2017; Falcao, Bradshaw, Garrett, Bilardi, Chen, Zablotski, & Williams, 2016). The findings from this study are consistent with this existing research. Several couples indicated that they were using PrEP to replace condoms, and that PrEP gave them a way to prevent HIV transmission while maintaining the intimacy that not using condoms provided. One couple was currently expecting a child and had chosen PrEP to protect the HIV negative female partner from transmission during their attempts to conceive. Another couple was currently trying to conceive and were using PrEP to protect the HIV negative male partner from transmission.

While couples in this and other studies have indicated that they want to use PrEP, so they don't have to use condoms, clinicians and other providers recommend that people in serodiscordant couples continue to condom use even when the partner living with HIV is virally suppressed, and the HIV negative partner is on PrEP. One study found that even though the CDC has endorsed the U=U (Undetectable = Untransmittable) message, many providers are still reluctant to tell people that they don't need to use condoms and fully embrace the U=U message (Ngure, Ongolly, Dollah, Awuor, Mugwanya, Irungu & Mugo, 2017). Research also shows that people are often frustrated and confused about providers' insistence that they continue using condoms when they begin PrEP use and are in a relationship with a virally suppressed partner (Irungu, Ngure, Mugwanya, Awuor, Dolla, Ongolly, & Mugo, 2021). This is an area for further research as we enter the era of U=U. There is a need for more information on how this message is received and operationalized by patients and providers.

PrEP Use Due to Concerns About Condom Efficacy. Another condom-related finding of this study is that some participants had chosen to use PrEP because they did not trust condoms as a reliable HIV prevention method. Two couples recounted incidents where a condom broke during intercourse and credited these incidents as the impetus to begin PrEP. While these couples were still using condoms, they expressed concerns about condoms breaking and condoms being stuck in the female partners vagina and felt that PrEP provided an extra layer of protection in case these events occurred. There is some existing evidence that couples sometimes choose to use PrEP to allay concerns about condom efficacy. Studies have shown that some people report that PrEP is a "good addition" to other prevention methods such as condoms. Findings from a qualitative study among sex workers and MSM in South Africa showed that many of the participants started using PrEP as added protection because of challenges they experienced using condoms. These challenges included partner refusal to use condoms, having partners with unknown HIV status, having more than one sexual partner, involvement in sex work, and having sex with a partner living with HIV (Pillay, Stankevitz, Lanham, Ridgeway, Murire, Briedenhann, & Mullick, 2020). In a study of MSM in African migrant communities living in Scotland, participants reported wanting to use both condoms and PrEP because they believed that neither method was 100% effective and therefore, combining these methods improved prevention (Young, Flowers, & McDaid, 2014). Based in this information, when providers are promoting PrEP use, they should consider whether having added protection may be an incentive for their patients and clients who are in serodiscordant relationships. They may also want to take the time to determine whether the individual or couple has had issues with condoms in the past and take this as an opportunity to educate about correct condom use as well as the benefits of PrEP in the event that condoms fail or are not used correctly. For those who are incentivized by having "added protection", this may be an effective way of encouraging PrEP use.

Relational Efficacy

Some of the PrEP users in this study indicated that they experienced a sense of bonding, comradery, and ability to adhere to their PrEP regimen because they were taking their medication with their partner. There is some existing research to support this finding. For example, Fonner et al. (2016) found that couples expressed a sense of being "in this together" when the HIV negative partner was using PrEP and couples centered "partner support" as key to PrEP adherence. This finding in particular highlights the importance of the relational aspect of PrEP use for serodiscordant couples.

A couple of additional studies show that individuals who have a sense of being "in this together" experience less stress and more relationship satisfaction (Bahan & Huić, 2017) and may also build a shared sense of efficacy through bonding and having shared experiences (Asano, Ito, Yoshida, 2016).

For the purposes of this study, I am calling this construct relational efficacy. I am defining relational efficacy in the context of PrEP use in the population under study as emphasizing and building on the shared experience of taking medications to prevent HIV transmission in serodiscordant couples. Study findings indicate that taking mediation together extends beyond the use of PrEP to prevent HIV transmission. As a result of this shared experience, couples who discussed this phenomenon reported feeling closer to their partner, feeling a stronger sense of commitment and HIV negative partners reported feeling like they understood their partners better through the experience of taking daily medication together. This construct should be researched further to better understand how building a sense relational efficacy might encourage PrEP use and potentially PrEP adherence. Those who are creating couples-based interventions to encourage PrEP use and adherence can build upon the unique characteristics of being in a relationship to help couples make the decision to use PrEP as a part of their HIV prevention regimen.

Theory of Gender and Power

Sexual Division of Power

The construct of sexual division of power was one of the main themes that emerged from the Theory of Gender and Power. This theory has been used extensively in HIV research to better understand the dynamics of HIV transmission, particularly male-to-female transmission. Research indicates that nearly a quarter of women's HIV risk in heterosexual relationships is due to power imbalances in these relationships (Rinehart, Al-Tayyib, Sionean, Whitesell, Dreisbach, & Bull, 2018). In fact, several effective interventions have been created using the Theory of Gender and Power as the primary theoretical model (Wingood, Camp, Dunkle, Cooper, & DiClimente, 2009). A meta-analysis of HIV and STI interventions found that those interventions that addressed gender and power are five times more likely to be effective. Specifically, these interventions effectively reduced HIV, STIs, and unintended pregnancies more effectively than those that did not include considerations of gender and power (Haberland, 2015). This study is unique in that the findings indicate that <u>both</u> the partner living with HIV, and HIV negative women face barriers in negotiating safer sex with their male partners. Some of females living with HIV in this study reported that they wanted their partners to begin PrEP and/or use condoms to protect themselves from HIV transmission. However, they were often unsuccessful in convincing their partners to engage in any of these methods for risk reduction. In addition, some of the women in the sample had become HIV positive because of power imbalances in previous relationships.

One HIV negative male partner believed that his partner wanting him to use PrEP signified that his partner living with HIV was being unfaithful and refused to even consider taking it. All these factors demonstrate how women are often balancing the desire for sexual safety with relationship security, and how these two factors are often at odds. While sexual risk reduction is important, for man women pressing the issue can jeopardize the stability of their relationship. Women in mixed status couples need support in navigating this rocky terrain. One way to achieve this could be couples-based interventions where providers serve as third-party introducing and encouraging the sexual risk reduction. In addition, women can be provided with evidence-based communication and negotiation skills.

Some consideration has been given to how to protect HIV negative women in power imbalanced relationships. These considerations include helping women to develop condom negotiation skills (DePadilla, Windle, Wingood, Cooper, & DiClimente, 2011; Weine, Golobof, Bahromov, Kashuba, Kalandarov, Jonbekov, & Loue, 2013) and placing an emphasis on female controlled prevention methods such as female (internal) condoms (Kaler, 2004; Panchanadeswaren, Johnson, Go, Srikrishnan, Sivaram, Solomon, & Celentano, 2007), and more recently, PrEP (Bekker, Johnson, Cowan, Overs, Besada, Hiller, & Cates, 2015). There has not been consideration of how women living with HIV can convince their partners to protect themselves. This study is unique in that it highlights how the construct of sexual division of power can place women and men at risk. While HIV negative women can choose to take PrEP without consent from their partners, women living with HIV cannot control whether their partners choose to use PrEP. Women living with HIV who desire for their partners to take PrEP should be provided with support and resources to assist in the process. HIV negative heterosexual men should have information and resources targeted specifically to them to encourage PrEP use.

Cathexis

Cathexis refers to the social exposures that women are impacted by such as cultural and gender norms as well as family, partner and cultural influences that make HIV prevention difficult (older partners, desire to conceive, exposure to high-risk partners who do not want to practice safer sex). The concept of cathexis emerged as a key factor in determining whether couples used PrEP and impacted the overall context of the relationship. For example, one HIV negative female PrEP user reported facing significant challenges getting her male partner who is living with HIV to take his medication regularly. This dynamic placed the female partner in the role of caretaker of her male partner. In addition, this placed her partner in danger of becoming detectable and placing her at higher risk of HIV transmission. One respondent took her HIV negative male partner to her doctor and had him placed on PrEP because he refused to use condoms. Another HIV negative male respondent stated that he did not want to start PrEP because none of the doctors or providers he visited were male. In gynecological research, there is some evidence that women prefer female doctors over male doctors due to the intimate nature of the medical services being provided (Yanikkerem, Özdemir, Bingol, Tatar, & Karadeniz, 2009). I believe that it is possible that this respondent might have preferred a male doctor because of the nature of the conversations that need to occur when discussing the prevention of sexual transmission of HIV. Even if a patient cannot be provided with a same-gender provider, clinicians should still take these feelings into consideration and take steps to increase comfort and address concerns that people may have when seeking more information about PrEP.

All of these examples highlight how perceptions about gender norms and roles serve to increase HIV transmission risk in relationships. Women in this sample were often placed in the position of being the caregiver for both their partners living with HIV and their HIV negative partners. Many of the female partners living with HIV were concerned about the health and safety of their HIV negative partners but were unable to activate their concerns and protect their partners through the use of PrEP. This is evident in the fact that all but one of the PrEP non-users were male. If we are to adequately promote PrEP use to male and female heterosexual individuals, the messaging will need to change. For example, promotional campaigns targeted to heterosexual couples should prominently feature couples rather than individuals and frame PrEP use as a decision that a couple can make together to enhance their relationship. Also, messaging should deliberately feature heterosexual men speaking about their experiences and reasons for using PrEP, so they begin to view themselves as one of the target audiences for PrEP. The CDCs Compendium of Evidence Based Interventions and Best Practices for HIV Prevention currently have three evidence-based interventions that target heterosexual couples. Only one of these interventions target serodiscordant couples. The main focus of this intervention is increasing condom use. Now that we have PrEP as an HIV prevention tool interventions need to be created or adapted to include or focus on increasing PrEP uptake in this population. Interventions for couples and individuals will need to address attitudes and beliefs about gender, masculinity and how these constructs impact HIV transmission risk.

Strengths and Limitations

This study has several strengths. The participants in this study primarily self-identified as African American (77%). While African Americans make up approximately 13% of the US population, they accounted for 42% of new HIV cases in 2019. Because of this disparity, it is important to take steps to improve prevention efforts in this population. This study gathered unique perspectives from African Americans that may contribute to interventions for this target audience. Most of the research on heterosexual serodiscordant couples has been conducted internationally. Another strength of this study is that involved a United States based sample, which yielded data that captures the unique perspectives of couples in the United States. This qualitative study had 52 participants, a large number of respondents which yielded rich data. In addition, this study involved couples, which allowed for verification and reinforcement of experiences and a deeper understanding of how couples (not just individuals who are in relationships) make decisions regarding PrEP use.

This study has several limitations. First, all the data in this study is self-reported. All accounts of PrEP uptake, relationship factors and other experiences are based solely on the information provided by the participants. One of the things that helps to somewhat offset the self-reported nature of relationship factors is that couples were interviewed separately, and examination of the data shows that many of the accounts from the members in the couple were the same or very similar. Another limitation is that all of the data were collected before Long Acting Injectable (LAI) PrEP was available. This may impact PrEP acceptability and uptake because PrEP no longer requires taking a pill daily. All but one of the non-PrEP users were male. Because only one female PrEP non-user was interviewed, it should be noted that findings regarding facilitators, barriers and other PrEP use factors may only be applicable to male PrEP non-users. Another important thing to note is that all the participants self-reported that they were virally suppressed. This means that viral suppression status was not confirmed in a lab and may not have been accurate. Many participants living with HIV reported that they did not take their medication regularly, and even small lapses in medication adherence can lead to changes in viral load. The fact all people reported being virally suppressed may have influenced PrEP non-users' decision not to use PrEP because there is evidence that when a person living with HIV is virally suppressed, they cannot transmit HIV. This fact may have made some couples feel that they did not need to take PrEP and that they were not the target audience for this prevention method. Finally, the average age of the participants in this sample was 48 years and the average length of the relationships in this study was 10 years. Findings from this study may not be applicable to younger heterosexual serodiscordant couples or those who are in relationships of shorter duration.

Conclusion

Overall, this study helped to elucidate several potential factors that could influence PrEP use among heterosexual serodiscordant couples. This study can serve as a way to help researchers, providers and practitioners learn how to assess and address the barriers and facilitators to PrEP use in this population. This study is novel because it examined data from couples and sought to understand barriers and facilitators of PrEP use from the perspective of both the person living with HIV and their HIV negative partner.

The findings from this study have several implications for future research. First, researchers and practitioners can take the constructs from the two theoretical models used in this study to better understand the barriers and facilitators of PrEP use in this population. For example, those who have low perceived threat of HIV transmission may not see themselves as candidates for PrEP. Researchers can seek to better understand how they can help people in serodiscordant relationships assess their risks and make decisions based on accurate information and with a full understanding of the resources they have available to them, including PrEP. Even if a couple chooses not to use PrEP when the option is first presented, they will have the information they need to make that decision in the future should their risk level or other factors change.

Other areas for future research include gaining a better understanding of how gender and power in relationships influence the use of PrEP. Previous research in this area has understandably focused on condom use. There are different considerations when seeking to understand how power imbalances can impact PrEP use because it is a biomedical intervention with the concerns that come with taking medications and it is a potentially female-controlled method that may help address some of the concerns about power imbalance. Additionally, this study demonstrated how power dynamics in relationships can impact not only HIV negative women, but it also impact the ability of women living with HIV to influence their partners decision to use PrEP. This places HIV negative women and women living with HIV in the position of serving as the caregiver and coordinating the care of their male partners. More research is needed to understand how to ease the emotional burden of caretaking that women often take on when they are in relationships with men. There is also a need for better understand how the constructs from the Theory of Gender and Power specifically impact the decision to use PrEP in heterosexual serodiscordant couples. For example, couples based interventions can assess power imbalances in relationships, teach and encourage healthy relationship dynamics and build more equitable partnerships that benefit all parties involved. One intervention that could be adapted for this purpose is *Love Notes* developed by The Dibble Institute. This intervention is designed to teach young adults about healthy relationships and consent (McClain, McGhee, Burr, Holmes, Mansker, & Garlington, 2021). Modules can be adapted to help couples support serodiscordant couples to prevent HIV transmission in their relationships. The construct of relational efficacy was a unique construct found in this study. Further research is also needed to understand how the cues to action found in this and other studies impact the decision to use PrEP. For example, this construct might influence decision making, PrEP adherence and relationship satisfaction. Clinicians, counselors and intervention developers can use what is learned from this research to better understand how to encourage PrEP use in heterosexual serodiscordant couples.

More research is needed to gain a better understanding of how to effectively promote PrEP to HIV negative heterosexual men in serodiscordant relationships and how to teach women living with HIV effective PrEP negotiation skills. To date, many of the marketing and other promotional campaigns for PrEP are targeted toward gay men and MSM. This fact may make some heterosexual men feel that they are not candidates for PrEP. Marketing experts and health literacy professionals can use information from this and similar studies that support these findings to create and pilot promotional materials that resonate with heterosexual men, women, and couples. There is also a need for more research to help develop couples-based interventions to promote PrEP in mixed status couples. Clinicians often have not been trained to assess the risk of their patients and clients to more effectively prescribe prevention regimens, including PrEP. An example of an evidence based intervention that could be developed is One Key Question, a intervention developed by Power to Decide (formerly the National Campaign to Prevent Teen Pregnancy). One Key Question is a short intervention that prompts physicians to ask their patients of reproductive age about their current pregnancy intentions. Clinicians are trained to provide contraception and reproductive health recommendation based on the answers provided. Similarly, interventionists could develop an intervention designed to prompt physicians to assess sexual risk and encourage recommended health actions based on the responses they receive. Recommendations might include receiving a prescription for PrEP, regular HIV testing, or counseling. Intervention researchers can use the theoretical frameworks and findings from this and other studies to create and test interventions targeted for this population. This study is a first step in examining the factors that influence the decision to use PrEP in heterosexual serodiscordant couples. The findings from this study can help to inform future interventions and research that will increase PrEP use in the population under study.

Appendix A

Qualitative Interview Questions

Non-User, HIV Negative Partner

1. When did you start thinking you did NOT want to be on PrEP?
2. What was the main reason you decided NOT to take PrEP (e.g., condoms and/or partner's ART is enough, concerned about side effects, potential for health problems, uncomfortable with the idea of taking Truvada, concern over out-of-pocket costs)? Were there other reasons?
3. When did you finally make this decision (decision NOT to take PrEP)?
4. Had you considered maybe taking PrEP at all during this period? What made you feel you might want to take PrEP?
5. What did your partner think about PrEP? Did s/he support your decision?
6. Has your choice to NOT take PrEP changed your relationship in any way (e.g., in terms of how you communicate, the balance of power in the relationship, how close you feel, how you trust each other, etc.)?
7. Have you and your partner had any discussions about the need to change preventive practices like condom use as part of the decision to NOT take PrEP? [If so], Can you tell me what that conversation was like? Who initiated it? Who said what? How did you feel afterwards? How do you think your partner felt?
8. [If yes], What would you say were the main reasons for changing condom use in the relationship after deciding NOT to go on PrEP?
9. [If no discussions], In deciding NOT to go on PrEP, has anything changed in terms of how you use protection (e.g., more condom use)?

10. How effective do you feel condoms are at preventing HIV? Compared to PrEP? Compared to your partner attaining an undetectable viral load?

Non-User, HIV Positive Partner

1. Did your partner ever talk to you about PrEP? Was it something you had already thought about?
2. How did your partner feel about it at first?
3. Would you have preferred that your partner chose to take PrEP? [If yes], why. [If no], why not?
4. What do you think were the main reasons your partner decided NOT to take PrEP?
5. Do you think your partner might choose to take PrEP in the future? [If yes], what do you think would make him/her change him/her mind?
6. Do you think there is anything that would change his/her mind?
7. Has your partner's choice to NOT to take PrEP changed your relationship in any way (e.g., in terms of how you communicate, who has more power in the relationship, how close you feel, how you trust each other, etc.)?
8. Have you and your partner had any discussions about the need to change preventive practices like condom use as part of the decision to NOT take PrEP? [If so], Can you tell me what that conversation was like? Who initiated it? Who said what? How did you feel afterwards? How do you think our partner felt?
9. [If yes], What would you say were the main reasons for changing condom use in the relationship after deciding NOT to goon PrEP?

10. [If no discussions], In deciding NOT to go on PrEP, has anything changed in terms of how you use protection (e.g., more condom use)?

User, HIV Negative Partner

1. When did you first hear about PrEP and how did you hear about it?
2. What were your first thoughts when you heard about PrEP as a way to reduce your own HIV risk? Did anyone influence you, or persuade you, to eventually make an appointment with a doctor to learn more about PrEP? Who influenced you the most? Did you decide right away ... or take your time?
3. So, what was the main reason you decided to take PrEP (e.g., HIV prevention in general, in the context of conception, stop using condoms, etc.)? Were there other reasons?
4. Can you tell me what you expected when you made the decision to start taking PrEP (e.g., expected to be free of worrying about becoming infected, to be able to conceive naturally without becoming infected, to stop or reduce condom use)?
5. Did your partner or others influence any of these feelings or thoughts?
6. How long did you expect to be taking PrEP?
7. Did you expect that going on PrEP would change whether or not, or how often, you used condoms or would change how often or how you had sex with your partner ... or others?
8. What did your partner think about you taking PrEP? What expectations did s/he have?

User, HIV Positive Partner

1. Did you want your partner to be on PrEP when you first heard about it? Why/why not?
2. How did your partner feel about it at first?
3. What did you think would change if your partner was on PrEP (PROBE: less worried about transmission/worry free; excited about the possibility of conception, happy can reduce/stop condom use, guilty that your partner has to take the same medication as you; shared experience/responsibility)?
4. Did any of this change? Were you supportive of your partner taking PrEP from the beginning?
5. Which of you was more enthusiastic about the idea? Why do you think that was?
6. How much did you and your partner talk about PrEP before s/he decided to start on PrEP?
7. What kinds of things did you talk about?
8. What do you think were the main reasons your partner decided to take PrEP?

Appendix B

Participant Characteristics

#	Couple Status	Years together	Female Partner Name	Female Partner Age	Male Partner Name	Male Partner Age
1	PrEP Non-User HIV+F	7	Candice	49	John	50
2	PrEP Non-User HIV+F	25	Jennifer	55	Calvin	55
3	PrEP Non-User HIV+F	18	Monique	51	Evan	38
4	PrEP Non-User HIV+F	17	Amber	62	Chris	55
5	PrEP Non-User HIV+F	8	Joan		Lawrence	46
6	PrEP Non-User HIV+F	10	Regina	41	Daniel	51
7	PrEP Non-User HIV+F	19	Maxine	59	David	60
8	PrEP Non-User HIV+F	10	Molly	49	Andre	48
9	PrEP Non-User HIV+F	17	Tiffany	51	Jack	56
10	PrEP Non-User HIV+F	5	Kelly	55	Cole	62
11	PrEP Non-User HIV+M	5	Shana	50	Marcus	54
12	PrEP User HIV+F	2	Amani	61	Cameron	52
13	PrEP User HIV+F	5	Sheila	36	Darren	35
14	PrEP User HIV+F	22	Christina	46	Damien	53
15	PrEP User HIV+F	3	Alexis	26	Shawn	26
16	PrEP User HIV+F	7	Heather	43	George	46
17	PrEP User HIV+F	20	Kerry	60	Bobby	60
18	PrEP User HIV+F	2	Olivia	51	Brian	47
19	PrEP User HIV+M	2	Julia	29	Payne	39
20	PrEP User HIV+M	5	Linda	43	Andrew	53
21	PrEP User HIV+M	5	Lorie	43	Arthur	46
22	PrEP User HIV+M	14	Brittany	54	Jermaine	48
23	PrEP User HIV+M	8	Tanya	64	Michael	50
24	PrEP User HIV+M	24	Tasha	50	Randy	67
25	PrEP User HIV+M	25	Donna	40	Lewis	50
26	PrEP User HIV+M	2	Janine	32	William	31

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