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**HIV Treatment Adherence in Minority Women: The Role of  
Intimate Partner Violence and Beliefs about Medication**

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BARRY UNIVERSITY

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By

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## Abstract

HIV/AIDS treatment is complex and multi-determined. Beliefs about medication and intimate partner violence (IPV) have independently been associated with low adherence to treatment. This cross sectional, secondary data analysis was designed to determine if IPV or beliefs about medication accounted for more variance in adherence to HIV/AIDS treatment in a sample of ethnic minority women (N=246). Results showed that IPV was negatively related to adherence. Additionally, IPV and beliefs about medication were non-significant as predictors of adherence. Results suggest that clinicians should continue to view treatment adherence as multi-determined and consider the role of IPV when developing interventions to increase HIV/AIDS treatment adherence in minority women.

## HIV Treatment Adherence in Minority Women: The Role of Intimate Partner Violence and Beliefs about Medication

### *HIV and Women*

Since the beginning of the HIV/AIDS epidemic there has been an increase in the rate of HIV infection and AIDS diagnosis among women. In 1992, in the US, women accounted for 14% of AIDS cases and by the end of 2005, women accounted for approximately 23 % of AIDS cases (Center for Disease Control [CDC], 2008). In the US, minority women account for the majority of new HIV infection cases among adults and adolescents. In 2008, African-American women had approximately 23 times the rate of AIDS cases compared to White/non-Hispanic women and four times that of Hispanic women. During that same time, African-American and Hispanic women represented 24% of the female population in the United States. However, they accounted for approximately 82% of AIDS cases for women (CDC, 2008).

From 1981 through 2005, approximately 85,844 women have died from complications of AIDS. This accounts for 16% out of 530,756 people who have died as a result of AIDS (CDC, 2008). In 2004, HIV/AIDS was the leading cause of death among African-American women between the ages of 25 and 34 years. It was also the fourth leading cause of death for African-American women between the ages of 45 and 54 years and for Hispanic women between the ages of 35 and 44years. Furthermore, HIV/AIDS was the fifth leading cause of death among women between the ages of 35 and 44 years. The CDC (2008) reported that the only diseases to have cause more death in women are cancer and heart disease.

## Women's Vulnerability to HIV

### *Theory of Gender and Power*

Wingood and DiClemente (2000) have extended Connell's theory of gender and power to explain women's vulnerability to diseases, including HIV. Connell's theory consists of three social structures, sexual division of labor, sexual division of power, and structure of cathexis, that permit the disparities seen in the relationship between men and women. While the first two structures have been already identified in other theories explaining gender relationships, structure of cathexis was created by Connell (1987) to explain the affective component of gender relationships. While these structures are distinct they also interact to create inequities between men and women. Although society continues to change many of the stereotypical views of women and men these structures continue to work through social mechanisms such as discriminatory practices in the work place, sexual division of power within relationships, and degrading images of the role of women in society (Wingood & DiClemente, 2000). Wingood and DiClemente (2000) suggested that each structure exposes women to different risk factors, which in turn increase their vulnerability to adverse health outcomes, economic, and social outcomes as well as influencing knowledge, attitudes, beliefs and skills, and behavior.

### *Sexual Division of Labor*

Sexual division of labor refers to the relegation of women to occupations that confine them to unequal positions compared to men. This social structure is maintained through social mechanisms that promote unpaid work for women (i.e., childcare, and housework) and different educational tracks for men into higher income-generating jobs (e.g., engineering). This structure promotes inequities that place women at a higher risk

of living at or below the poverty level, having less than a high school education, being unemployed or homeless, and having none or little health insurance. Furthermore, this social structure is linked to socioeconomic risk factors that are more likely to affect ethnic minority and young women (Wingood & DiClemente, 2000). In an overview of the literature, Wingood and DiClemente (2000) found several studies that supported their theory that economical inequities place women at an increased risk of contracting HIV.

#### *Sexual Division of Labor and HIV/AIDS*

There are several studies that support the economical disadvantages brought on by the sexual division of labor. It is common for women with higher incomes to ensure that their male partners use a condom compared to women with lower incomes (Crosby, Yarber, DiClemente, Wingood, & Meyerson, 2002; Kalichman, Williams, Cherry, Belcher, & Nachimson, 1998). Furthermore, African American women who are unemployed and financially dependent on their male partners are more likely to engage in HIV risk behaviors as a result their partner's demands (Kalichman et al., 1998; Lichtenstein, 2006). Thus, some women may succumb to the demands of their male partners for fear of losing basic needs such as shelter (Lichtenstein, 2006; Wingood & DiClemente, 2000).

Another factor limiting women's access to health care is not having health insurance. Many uninsured women with STDs and other health problems will delay seeking treatment longer than women who have health insurance. Untreated STDs increase the chances of women contracting HIV from their male partners. The longer an STD goes untreated the greater the risk of contracting the virus because one's immune system is in a weakened state (Forna et al., 2006; Wingood & DiClemente, 2000). The

socioeconomic risk factors brought about through the social division of labor are more pronounced among ethnic minority women (Wingood & DiClemente, 2000). Thus, Wingood and DiClemente (2000) noted that it is no surprise that ethnic minorities are disproportionately infected with HIV/AIDS. These researchers suggested that ethnic minority women's lack of condom use can be attributed to them having to address more immediate survival needs such as food and shelter for themselves and their children.

The sexual division of labor takes away one's ability to live independently of others. It limits women's ability to behave or to change their behavior in a desired direction. It takes away their power, thus, making this social structure the building block of the second structure, the sexual division of power (Wingood & DiClemente, 2000).

#### *Sexual Division of Power*

Wingood and DiClemente (2000) defined power as having the ability to change an individual or having control over others. The source of power can be drawn from an institutional or interpersonal level. The inequity of power from either source creates an environment where women find themselves unable to assert positive changes in their lives.

At the institutional level, the division of power is maintained through social mechanisms such as abuse of power in relationships (i.e. in the workplace), and the media, through images of sexual degradation and disempowering statements about women. At the interpersonal level it is maintained through men holding stereotypical views of their role (Wingood & DiClemente, 2000).

Some of the risk factors related to power inequalities are sexual and physical abuse in relationships, having a partner who engages in unsafe sex practices, and limited

access to drug treatment or STD prevention education. Behavioral risk factors include having a history of alcohol and drug use, low self-efficacy, and poor assertive communication skills (Wingood & DiClemente, 2000). All these factors subsequently impact women's health.

Wingood and DiClemente (2000), in concurrence with Connell, suggested that women's vulnerability to HIV can be explained by the distribution of physical, social, and economic power. Women's lack of power in relationships limits the amount of control they have over their sexual behaviors, hence limiting their ability to practice safe sex. In an overview of the literature several studies support the way that the sexual division of power increases women's (specifically minority women) chances of being in an abusive relationship and/or puts limitations on control over their behavior.

#### *Sexual Division of Power and HIV/AIDS*

African American women who are in abusive relationships are less likely to suggest that their partners use a condom. Their suggestions can be met with verbal and physical abuse. Similarly, among Hispanic women, fear of their partners' response to the suggestion of condom use is a significant predictor of the lack of condom use (Kalichman et al., 1998; Lichtenstein, 2006). The uneven distribution of power increases the likelihood of women having unsafe sex practices imposed on them by their partners (Wingood & DiClemente, 2000). If condoms are going to be used as a preventative measure against contracting HIV, male cooperation is essential. Women whose partners disapprove of condoms are more likely to never use a condom during sexual intercourse. Furthermore, men who engage in unsafe sex practices in their primary relationships are also more likely to behave in the same manner in their outside relationships.

Additionally, men who have the advantage of physical, social, and economic power are less likely to disclose any information about their outside relationships or other risky behaviors (i.e., drug use) to their intimate partners. In contrast, women who are not in abusive relationships but have a steady intimate partner are more likely to never use a condom because they are under the impression that their partner does not engage in sexual relations outside of the relationship (Kalichman et al., 1998; Lichtenstein, 2006; Wingood & DiClemente, 2000).

Because of many women's perception of their gender role they are rendered vulnerable to accepting the sexual desires of their male partners. Among African American women who have viewed x-rated movies with images of women consenting to the sexual desires of men, are more likely to have a greater desire for pregnancy, less condom use, and more sexual partners (Wingood & DiClemente, 2000). The media often portray women as having little or no control over their bodies, which influences the views women hold of themselves and their self-efficacy (Wingood & DiClemente, 2000).

Self-efficacy plays a significant role in women's ability to negotiate safer sex practices. Women with low self-efficacy are less likely to avoid unhealthy behaviors, to control the use of condoms in their relationships, and are more likely to engage in high risk sexual behaviors. Self-efficacy is reduced when women are involved with an older partner, in an abusive relationship, or perceive themselves as being in a monogamous relationship (Lichtenstein, 2006; Sowell, Seals, Moneyham, Guillory, & Mizuno, 1999).

Women who are involved in controlling and abusive relationships may tend to compromise the limited power they may have through the use of alcohol and other drugs (Wingood & DiClemente, 2000). Women in these situations may use substances to

escape and numb the pain of their reality; however, it may strengthen the control men have over women by disinhibiting them, thus increasing their risk-taking behaviors (Sharpe, Lee, Nakashima, Elam-Evans, & Fleming, 2004; Wingood & DiClemente, 2000). Women who are heavy drinkers are four times more likely to have had an STD compared to women who do not have a drinking problem. Additionally, women who engage in drug use such as crack-cocaine are likely to have had more than one STD and be involved in prostitution. The risk-factors associated with substance use are also directly associated with acquiring HIV/AIDS (Sharpe et al., 2004; Wingood & DiClemente, 2000).

The social mechanisms that maintain the sexual division of power exposes women to an increase risk of contracting HIV/AIDS. Furthermore, the level at which these social mechanisms are most influential such as through relationships and the media, overlaps with the third structure, which is the structure of cathexis (Wingood & DiClemente, 2000).

#### *Structure of Cathexis*

The structure of cathexis focuses on affective attachments and social norms. It dictates what are appropriate sexual behaviors and emotional attachments for women. It also shapes society's expectations and perceptions of women's sexual roles (Wingood & DiClemente, 2000).

At the institutional level, cathexis is maintained through social mechanisms such as cultural norms and stereotypical beliefs that enforce strict gender roles. Many cultural norms and stereotypical beliefs expose women to older partners, endorse mistrust in the medical system, condone religion affiliations that reject the use of contraceptives, and

support the importance of having children. These social mechanisms are manifested through social and psychosocial domains that can negatively influence women's health. Women who are more accepting of society's norms and beliefs are burdened with the task of trying to live by stereotypical guidelines that expose them to risk taking behaviors (Wingood & DiClemente, 2000).

#### *Structure of Cathexis and HIV/AIDS*

A common stereotypical belief is that older men are more sexually attracted to younger women and that younger women are attracted to older men. Adolescent females are less likely to use a condom with older males during intercourse than with a same age male partner (Wingood & DiClemente, 2000). Additionally, females who have a strong sexual attraction to a partner are also less likely to use condoms. Females are likely to equate trust and safety with being attracted to someone. Another factor that influences safe sex practices is motherhood. The value of motherhood is of great importance among African American and Hispanic women. Women with a strong desire to have a child will discontinue the use of condoms in an effort to conceive. However, this increases their risk of contracting the virus (Wingood & DiClemente, 2000).

In general, many African Americans are hesitant about seeking medical care. The distrust in America's health care system is a result of both actual events (i.e. Tuskegee syphilis study) and stereotypical beliefs that are sometimes reinforced by cultural practices (Sankar, Luborsky, Schuman, & Roberts, 2002; Wasserman, Flannery, & Clair, 2006). For example, most religious and cultural beliefs place the burden on the female to "pure", while males are almost expected to have multiple partners. The double standard

in how men and women should behave sexually promotes unsafe sex practices among women (Moore & Rosenthal, 1992).

The theory of gender and power examines how social structures create an imbalance between the type of experience, the amount of control, and the form of stigma that gender affords individuals. In terms of risk factors of contracting and receiving treatment for HIV/AIDS, some gender theorists would say that the odds are stacked against women (e.g., Wingood & DiClemente, 2000).

### *HIV/AIDS Drug Therapy*

There is no cure for AIDS. What exists are approximately 28 approved antiretroviral drugs that are used in highly active antiretroviral therapy (HAART) regimens in an effort to reduce viral loads, preserve the immune system, and postpone the onset of AIDS (Shibuyama et al., 2006). HAART is used to describe an aggressive drug therapy that consists of a combination of at least three antiretroviral drugs (Shibuyama et al., 2006).

The 28 approved antiretroviral drugs can be broken down into four basic categories. All the antiretroviral drugs within these categories are designed to postpone the ability of the virus to replicate itself. The four categories are nucleoside/nucleotide reverse transcriptase inhibitor (NRTI), nonnucleoside reverse transcriptase inhibitor (NNRTI), protease inhibitor (PI), and the newly approved category, fusion or entry inhibitor (Hammer et al., 2006; Shibuyama et al., 2006). Successful viral suppression can be attained with regimens that consist of a combination of antiretroviral drugs from any of the four basic categories.

Monotherapy is ineffective at suppressing the virus and is no longer standard practice (Hammer et al., 2006). However, deciding on a regimen is complicated, and one's choice of drug combination should take into consideration the stage of the virus, comorbid conditions, pill burden, adverse effects, and tolerance (Hammer et al., 2006). Personalizing a regimen may consist of several trial and errors of drug combinations but there are guidelines in place that can assist in selecting a HAART regimen (Hammer et al., 2006). However, with each type of combination there will be some type of adverse effect. Performing an array of health assessments may limit the adverse effects but it does not eliminate the occurrence of those effects (Hammer et al., 2006).

#### *Adverse Effects of HAART*

The introduction of HAART has also profoundly impacted the treatment of HIV/AIDS. However, these drugs can have consequences that range from being minor to fatal (Hammer et al., 2006; Shibuyama et al., 2006). Each antiretroviral drug has specific side effects. Some general side effects common to all the classes of antiretroviral drugs are headaches, dizziness, fatigue, insomnia, nausea, vomiting, diarrhea, and gastrointestinal complications (Shibuyama et al., 2006). Furthermore, isolating the drug that is causing the adverse reaction is difficult because of the multiple drug combinations involved (Hammer et al., 2006; Shibuyama et al., 2006). Additionally, the different combinations of antiretroviral drugs are likely to increase the toxicity levels in patients. As a result, the side effects encountered by the use of HAART are significant obstacles that impede adherence (Shibuyama et al., 2006).

Some adverse reactions are unavoidable but when the patients know what to expect it better prepares them to adhere to treatment. Many patients will often require a

change in regimen due to the adverse reactions or due to treatment failure. However, changes should only occur with the approval of the physician. It is also critical that patients are forthcoming with the physician about any complication that they are experiencing.

## Overview of Adherence

### *Definition of Adherence*

Adherence is a term used to describe a patient's ability to consistently follow his or her prescribed treatment plan (Wright, 2000). Bangsberg et al., (2001) defined adherence as the extent to which patient's health related behaviors are representative of medical advice. Adherence to the treatment of most long-term illnesses is often daunting and complex and consists of more than simply following directions. One's ability to accurately and consistently adhere to prescribed treatment plans requires active and continuous interaction between the client, physician, and other health care professionals (Bangsberg et al., 2001; Chesney, 2003; Wright, 2000). Overall, adherence emphasizes the partnership required of everyone involved in order to be successful with long-term care of chronic illnesses.

### *Factors that Increase Adherence*

Adherence to HIV treatment is more than taking one's medication at the scheduled time and following the recommended dosage. Some other aspects of HIV adherence are immediate testing for HIV, early start of medical treatment, keeping medical appointments or scheduled hospital visits and adjusting one's dietary plan and lifestyle as necessary (Roberts & Mann, 2000; Wright, 2000). Selecting a HAART regimen that is compatible with the client's lifestyle dramatically improve levels of

adherence (Chesney, 2003). A compatible regimen limits the changes and adjustments the client has to make to his or her lifestyle. The presence of emotional and social support also plays a pivotal role in reducing barriers and increasing motivation to adhere to treatment (Roberts & Mann, 2000). However, the first step towards increasing adherence begins with determining the patient's levels of adherence.

### *Measurements of Adherence*

Monitoring and measuring a patient's level of adherence is a difficult task. Despite the challenges, it is important that health care professionals exhaust all efforts to establish a patient's level of adherence (Chesney, 2000). The inability to gather this data will result in providing ineffective and poor quality of care to clients (Bangsberg et al., 2001; Chesney, 2000). Reliable measures of adherence are critical for most chronic illnesses, specifically HIV treatment. Assessing one's level of adherence is necessary for viral suppression, but also crucial in preventing the formation of resistant strains of the virus. The goal of adherence assessments is to be able to maximize recall and minimize bias (Chesney et al., 2000). There are several approaches used to measure adherence but there is no consensus on a single method (Chesney et al., 2000).

One common way to assess HIV treatment adherence is through a self-report questionnaire that is completed by an individual (Chesney et al., 2000). The Adult AIDS Clinical Trials Group Studies Questionnaire (AACTG) is a self-report measure that can be easily implemented in different settings. The AACTG is comprised of questions that allow clients to provide information on their treatment plan such as name of drug, prescribed number of pills per dose, and special directions for taking the medication. Clients are also able to provide information on the name of the drug they took in the last

four days and how many pills they have skipped within a specific time range. The questionnaire also allows clients to indicate potential predictors and circumstances that lower adherence. Additionally, clients can also provide information on how frequently they experience common side effects of the medication. Both clients' self-reports and physician's assessments provide vital information about one's ability to adhere to treatment (Chesney et al., 2000).

Physician's assessment of client's ability to adhere to treatment may be used to determine whether to withhold HAART from clients (Bangsberg et al., 2001). Physicians may be able to provide an estimate of their client's level of adherence through the use of questionnaires or interviews. Both methods require the physician to estimate the percentage of time the client has taken or missed his or her antiretroviral medication within a specified period of time (Bangsberg et al., 2001; Chesney et al., 2000). Studies have shown that physicians are likely to overestimate adherence, thus, it is recommended that other methods be used in conjunction with physician reports to assess adherence levels to HAART (Bangsberg et al., 2001).

The Medication Event Monitoring System (MEMS) is a device that records the date and time the medication bottle is opened and closed (Bangsberg et al., 2001). The device is a microchip that fits on the cap of most standard medication bottles. The microchip is usually placed on the bottle of the most frequently scheduled antiretroviral drug (Bangsberg et al., 2001). Generally, the device measures the percentage of doses taken within a period of time (Bangsberg et al., 2001). However, a limitation of the MEMS is it may underestimate adherence because clients may take more than one dose out of the bottle at any given time (Bangsberg et al., 2001). Another method that is

variably successful in measuring adherence is the use of unannounced pill counts. This method has the advantage of limiting the likelihood of deception on the part of the client (Bangsberg et al., 2001). Pill counts are usually carried out unannounced at the client's place of residence, which limits the possibility of the client disposing of pills because of knowledge of a scheduled pill count (Bangsberg et al., 2001). It has been demonstrated that both physicians' estimate and clients' self-reports over estimate adherence compared to pill counts (Bangsberg et al., 2001). Bangsberg et al., (2001) has also demonstrated that physicians' estimate explains 26% of the variance in unannounced pill counts, where as clients' self-report explains 72% of the variance seen in adherence by pill count.

Generally, the most common methods used to monitor treatment adherence are client's self-report, unannounced pill counts, MEMS, and laboratory findings (Chesney et al., 2000). Each method will have limitations because each client is different. One way to increase reliability of these methods is to use them in combination (Bangsberg et al., 2001; Chesney et al., 2000). There are numerous determinants that impact adherence. However, proper assessment is dependent on health care professionals. Proper assessment of adherence helps identify the difficulties with treatment and provide the opportunity to adjust treatment in an effort to provide adequate care (Bangsberg et al., 2001).

### Difficulties with Adherence

#### *Challenges with HAART Regimens*

Many of the difficulties with HAART are challenges that are also common in other treatments for long-term, chronic illnesses (Horne, 1999). HAART regimens are extremely complicated, mainly because of the array of drugs that are prescribed. As a result of the wide range of drugs, clients have reported difficulty remembering the names

of the medications, thus, making it difficult for them to consistently adhere to the appropriate drug (Catz, Kelly, Bogart, Benotsch, & McAuliffe, 2000). Another major challenge is the unwillingness to comply with the dosing schedule (Catz et al., 2000; Roberts & Mann, 2000). Dosing schedules are commonly forgotten by clients, especially among clients who begin to feel better and clients who have a busy day to day schedule (Catz et al., 2000; Roberts & Mann, 2000). Individuals infected with HIV are also likely to report that the frequency of their doses serve as a constant reminder of their status, thus, in an effort to forget their HIV status they simply fail to remember to take their medication (Catz et. al., 2000). The misunderstanding of prescribed instructions can account for some missed doses and independently it has been identified as a challenge (Roberts & Mann, 2000). Thus, this factor supports the importance of the physician-client relationship.

Individual factors such as socio-demographics, psychological distress, and other various personal characteristics, along with the concerns about the effects of the medications, influence adherence (Catz et al., 2000, Horne, 1999, Roberts & Mann, 2000). However, individuals who experience more of these challenges are more likely to report low levels of adherence. While men experience these challenges, research has suggested that women may be more likely to experience more of these personal challenges because of sex-related differences such as weight, metabolism, and hormones, which may make them less adherent to treatment than men (Hader, Smith, Moore, & Holmberg, 2001).

Research has demonstrated that there are numerous factors that obstruct the attainment of near perfect levels of adherence to HAART regimens. At a public health

level consistent adherence helps to reduce the chances of the development of drug-resistant viral strains, and assists in the effort to control the HIV epidemic (Bangsberg, et al., 2000). Despite the many challenges patients encounter in becoming adherent to HAART, the use of HAART has profound effects on treating the virus.

### The Study Constructs and Adherence

#### *Intimate Partner Violence (IPV)*

IPV is defined as a pattern of physical, sexual, or verbal abuse displayed by an intimate partner or spouse, and can also include economic coercion (World Health Organization [WHO], 2005). IPV is the most common form of violence experienced by women (WHO, 2005). Between 1.5 million and 3.9 million women experience physical abuse by their intimate partner each year (WHO, 2005). WHO (2005) has reported that regardless geographic, economic, or cultural background the prevalence of violence in the home profoundly influences women's physical and emotional well-being. IPV not only contributes to making women vulnerable to contracting sexually transmitted infections, including HIV/AIDS, but it also significantly influences a women's decision to seek assistance from health services for treatment or to contact law enforcement for protection (Kalichman et al., 1998; Lichtenstein, 2006; Wingwood & DiClemente, 2000; Wyatt, Myers, & Loeb, 2004). Traditionally, IPV has been considered a private matter and women have usually kept their abuse a secret, which leads to feelings of guilt, shame, and fear (Matud, 2005). However, the high rates at which IPV is being reported may suggest that IPV is a societal problem. IPV is a widespread problem and understanding the multifaceted role that it plays in the lives of women can provide valuable information to public health.

The more women are exposed to IPV their physical and mental health outcomes become worse. Bonomi et al., (2006) noted that to better understand the effects of IPV on women's health it is important to examine IPV within the context of proximity, recent (within the past five years) or remote (prior to but not during the past five years) exposure, type, and duration of the abuse. Women who have experienced recent physical or sexual IPV for long periods of time have more pronounced adverse health effects than women with no history of IPV (Bonomi et al., 2006). Furthermore, women who have experienced IPV in the remote past are more likely to distrust their community members and exhibit pronounced symptoms of depression (Bonomi et al., 2006).

IPV has been identified in the literature as a barrier to adherence to HIV treatment and also as a risk factor for being exposed to the virus. A significant number of women who are HIV positive have reported being physically, sexually, and verbally abused (Jones et al., 2003). Psychological symptoms and psychological disorders such as depression, anxiety, and post-traumatic stress disorder are positively correlated with IPV and therefore make treating HIV more complex. Furthermore, one's psychological state exerts influence over one's body, specifically, one's immune system. When a person's immune system is compromised, the capacity to handle difficult situations and tolerate stress is lowered (Jones et al., 2003; Simoni & Ng, 2002). With these mental health problems tied to IPV, ending the violence is not the only problem that would need to be addressed in order to increase adherence. Additionally, some women who are abused also have low socioeconomic status (SES) and experience social biases that exacerbate their already fragile state (Simoni & Ng, 2002). Near perfect level of medication adherence is difficult to attain especially for those who have been through traumatic events (Wyatt et

al., 2004). Cohen et al., (2000) reasoned that women who endure physical, emotional, and sexual abuse may not make complying to complex medication regimens their highest priority.

The presence of an infectious virus does not alter the cycle of violence. It may be assumed that being HIV-positive may serve as a deterrent to abuse, physical and sexual abuse, however it is still a common occurrence (Sowell et al., 1999). Approximately 15% of HIV infected African-American women have been the victim of at least one episode of physical abuse, and 55% have been verbally abused (Sowell et al., 1999). HIV-infected women, compared to non-infected women, are more likely to report higher levels of both physical and verbal abuse (Sowell et al., 1999). Among a small group of Hispanic women who were victims of IPV, researchers found that they categorized being infected with HIV as a form of abuse. Some of these women reported that their partners knowingly infected them as a means to prevent them from leaving the relationship (Moreno, 2007). Women infected with HIV are also more likely to report more general psychological distress, suicidal ideation, and physical health symptoms (Jones et al., 2003).

Women who are HIV-positive who have experienced traumatic events, such as physical or sexual abuse, and have a diagnosis of PTSD are more likely to report more physical HIV related symptoms. Rates of depression are more likely to be elevated among women living with HIV/AIDS (Axelrod et al., 1999). However, when depression was superimposed on other stressful life events it is associated with faster rates of immune failure (Simoni & Ng, 2002). Generally, the effects of partner conflict on mental health symptoms are further intensified among women who are HIV positive. However,

the experience of abuse whether physical, sexual, psychological/verbal also profoundly impacts the decision a women makes about seeking treatment (Wyatt et al., 2004). IPV not only plays an instrumental role in contracting HIV, but it also serves as a barrier to adhering to health care treatment and medication (Lichtenstein, 2006).

#### *IPV and HIV Treatment Adherence*

Women with a history of IPV are more likely to report lower medication adherence (Cohen et al., 2004; Lichtenstein, 2006). Additionally, women who are physically abused are more likely take a longer time to seek help compared to non-abused women (Wingwood, Diclementia, & Raj, 2000). It is difficult for disadvantaged women who have experienced IPV to access health care services, in part due to lack of insurance and feeling ashamed of the abuse. Abused and uninsured African American women are unlikely to receive services that are needed. These women have lower rates of utilizing health care services compared to the general population (Kalichman et al., 1998; Lichtenstein, 2006). Women who are afraid of their partners, depressed, and feel guilty about being abused are less likely to keep medical appointments because of the fear of being judged. Additionally, some HIV-infected women have reported that their abusive partners have sabotaged their efforts to seek care (Lichtenstein, 2006). Stalking, beatings, and negative statements about HIV medications such as “AIDS medicines will kill you”, are tactics used to frighten and impede care of these women (Lichtenstein, 2006). In the face of abuse, many women who are HIV-infected have reported feeling like “life does not matter and that they might as well be dead” (Lichtenstein, 2006). Abuse and infection with a chronic illness may trigger suicidal ideation. The thought of getting better and living a normal life seems unattainable, thus, leading to the

discontinuation of seeking health care (Lichtenstein, 2006). Fear of disclosure of one's status to an abusive partner, even though one may have acquired the virus from that partner, may lead to denial, thus, making the individual feel less inclined to seek medical care. Fear of disclosure not only leads to being secretive with one's partner but also with friends and family who can provide social support, which is vital to women's well-being and adherence to HAART (Lichtenstein, 2006). Among victims who reside with their abusive partner, sexual abuse and confinement also lead to delays in treatment and impede adherence.

Sexual abuse, confinement, stalking, and fear of disclosure are factors that disrupt treatment among HIV-infected women. However, these factors are only one cluster of barriers to HIV treatment adherence. Other related factors include psychological assets like internal locus of control, self-esteem, and competence. For example, health-related external locus of control is negatively correlated with internal locus of control. This finding suggests that HIV -infected women, who are victims of sexual abuse, may be more likely to believe that external factors such as faith or powerful others can affect their health (Somini & Ng, 2002). In addition, low self-esteem and competence not only impairs individual's ability to address personal health concerns but it also impairs the ability to escape a violent environment (Sowell et al., 1999). Women who are "worn down" by abuse or feel helpless and lacking control over their life may be unable to focus on following a complicated treatment regimen, such as HAART. These women may have particular difficulty taking their medication on a consistent basis (Lichtenstein, 2006).

*The Role of Beliefs about Medication on Treatment Adherence*

Social cognition models have proposed that health related behaviors are the result of one's level of motivation and personal judgment. In line with these models, numerous studies have found that it is critical for patients to take an active role in developing their treatment regimen (Bangsberg et al., 2001; Chesney, 2003; Wright, 2000). Taking an active role ensures that patients will make informed personal judgments and will also increase their self-efficacy in adhering to treatment. Self-efficacy plays a major role in regulating behavior and is influenced by one's beliefs. People who have high self-efficacy are likely to have stronger commitments towards following their prescribed regimen (Horne, 1999). However, one's ethnic and cultural background can influence one's lifestyle and life choices, including making decisions about health related issues. Cultural background has also been found to influence the perception of the advantages and disadvantages of using prescribed medications (Horne, Graupner, et al., 2004). Additionally, in some cultures it is customary to seek a holistic approach to both physical and emotional afflictions (Horne, Graupner, et al., 2004).

African Americans and other ethnic minority groups are likely to distrust the institution of medicine because of historical transgressions (Horne, Graupner, et al., 2004; Wesserman et al., 2007). Many African Americans are not only reluctant to seek treatment but they are also wary about the etiology of many life-threatening diseases and infections (Wesserman et al., 2007). Consequently, both beliefs about medication and beliefs about the etiology of one's illness can affect adherence.

Patients' beliefs about their illness, beliefs about the necessity of treatment, and concerns about the adverse reactions to treatment influence their decision to adhere to

prescribed drugs (Horne & Weinman, 1999). In general, people hold general and specific views about prescribed medication. General beliefs about medical treatment are distinct views about medicine and are likely to influence people's preference for when to begin medical treatment. In contrast, specific views about medicine are focused on a particular class of drugs or medical treatment (e.g., radiation). Specific views about medicine are likely to influence the decision to continue treatment (Horne & Weinman, 1999).

Although both general and specific beliefs influence health behavior, specific beliefs are more likely to predict adherence (Horne, 1999).

#### *The Role of Beliefs about Medication on HIV/AIDS Treatment Adherence*

It is imperative that patients clearly understand the purpose and side effects of treatment if they are to continue with long-term care that consists of a strict and complex regimen. Understanding the necessity of prescribed medication and concerns about taking medication has been associated with adherence among patients diagnosed with a chronic illness (Horne & Weinman, 1999). Horne (1999) noted that the patient's perception of their illness and about treatment can assist in understanding how patients make their decision to adhere to treatment. Allowing patients to voice their concerns and receive clarification about their illness and treatment can increase levels of adherence in long-term care. Individuals who believe that their medication is necessary in order to live a healthy life are more likely to report greater adherence. However, individuals who believe medication is necessary but have strong concerns about side effects are likely to report lower levels of adherence (Horne & Weinman, 1999).

Regardless of gender and socio-demographic factors, medication beliefs have been associated with adherence. As noted, however, gender and socio-demographic

factors may shape one's perception towards medication (Horne & Weinman, 1999). In a review of the literature, for example, Bogart and Bird (2003) found that African-Americans compared to Whites were more likely to believe that "the government is using AIDS as a way of killing off minority groups." Additionally, they found that African Americans compared to Whites were more likely to believe that "a lot of information about AIDS is being held back from the public." Furthermore, in a small sample mainly comprised of women, African Americans also endorsed the notion that "people who take the new medicines for HIV are human guinea pigs for the government." Despite negative beliefs about the etiology of HIV/AIDS and being uncertain about the effectiveness of HIV treatment African Americans are more likely to engage in preventative measures (Bogart & Bird, 2003). While preventative methods may be employed to avoid being infected with HIV, once infected strong negative beliefs and concerns about antiretroviral drugs increases the likelihood of nonadherence.

African American women generally hold negative attitudes towards the use of antiretroviral drugs (Richter, Sowell, & Delores, 2002; Siegel & Gorey, 1997). Minority women are more likely to believe that most antiretroviral drugs have not been adequately proven to have the same effect on people of color (Richter et al., 2002; Siegel & Gorey, 1997). This belief increases resistance towards beginning treatment and remaining consistent with treatment. Minority women may also be extremely concerned about how the medication might impact their daily functioning, particularly if these women are caregivers. Many ethnic minority women's negative beliefs about antiretroviral drugs are formed from their perception of the adverse reactions of the various medications and the feeling that remaining consistent to the regimen does not guarantee effectiveness (Richter

et al., 2002; Siegel & Gorey, 1997). Many women may be more confused about their treatment regimens because of exposure to mixed messages they received from their physician and the information from peers (Sankar et al., 2002). Sanker et al., (2002) reported that women who adhere to treatment express ambivalence towards their physician's directives and mainly rely on their individual judgment. Consequently, these women reported only taking their medications when their symptoms worsened and there was no other alternative (Richter et al., 2002; Siegel & Gorey, 1997).

Women's beliefs about medication may be associated with their ability to remain consistent with their prescribed treatment plan (Sankar et al., 2002). Their concerns about treatment may place them at risk for poor adherence (Richter et al., 2002; Sankar et al., 2002; Siegel & Gorey, 1997). When women are unsure about their medication they are likely to only use it when they are experiencing symptoms (Richter et al., 2002). Adherence may be improved once patients receive adequate information about their treatment and clearly understand the purpose of treatment (Horne, 1999; Sankar et al., 2002).

Regardless of gender or race, beliefs about medication influence adherence among patients with chronic illnesses. Providing adequate information that clarifies issues about the necessity and concerns of HAART can increase patient's beliefs about the efficacy of HAART and adherence to HAART (Horne, Buick, et al., 2004).

#### Rationale for Proposed Study

Adherence is not a recent concept or a new area of concern for public health. Adherence has been intensely researched dating back to the 1960s. Adherence is a major concern among a variety of medical conditions, specifically long-term chronic conditions

requiring prescribed drug treatments. Levels of adherence vary considerably and are dependent on the patient population, medical condition, form of treatment, and the operational definition of adherence. Research has identified poor levels of adherence as a significant contributor to drug-resistant strains of both HIV and tuberculosis.

Furthermore, low adherence makes it difficult to accurately assess the effectiveness of medical treatments and interventions (Myers & Midence, 1998). However, adherence to prescribed drug treatments brings about change. Noble (1998) reasoned that adherence is likely to occur when “The patient wishes to undertake treatment, is satisfied that the treatment being offered is the most appropriate course of action, can fully understand and is able to follow the behaviors required, is not impeded in any way during the course of the behavior, and is able to monitor progress towards the end goal” (p. 72).

Since the inception of HAART regimens, HIV has been viewed as a chronic illness. As a result, the burden of monitoring one’s medication dosage and self-care has been placed on the patient (Wright, 2000). This sudden transfer of responsibility comes with a variety of challenges. The diagnosis of an incurable disease automatically increases psychological distress that can range from severe depression to suicidal ideation and attempt (Catz et al., 2000). Although adequate adherence to HAART can slow the progression of the virus and suppress many of the symptoms, achieving high levels of adherence required to make HAART effective against HIV can be difficult. Adherence to HAART is a multilayered problem that is affected by an interaction of complex factors, thus, making it an extremely complicated issue. Essentially, adherence is an important health care problem and a better understanding of the factors that affect adherence enhances the quality of health care. However, between men and women,

women are likely to exhibit poor adherence because of underlying mechanisms such as access to resources, decision making power, social and cultural responsibilities, and more serious adverse reactions.

Minority women are being infected with HIV at alarming rates and they also experience many difficulties with remaining consistently adherent to antiretroviral therapy (Berg et al., 2004; Robert & Mann, 2000). Research has demonstrated that a substantial amount of women who are HIV positive are involved or have been involved in a violent intimate partner relationship. Studies have also shown that when women become infected with HIV this can precipitate violence within their intimate relationships (Moreno, 2007). Adherence often requires patients to rearrange activities in their daily lives. However, women in violent relationships often lack the ability and control over their life to make the necessary changes (Lichtenstein, 2006). Generally, these women are more concerned about their physical safety and are likely to be living in fear. This type of environment is not conducive for optimal adherence to a complex drug therapy regimen. Research has suggested that one of the requirements of HAART is an environment that is flexible, supportive, and accepting of the demands that are mandated (Lichtenstein, 2006).

Adherence to HAART also requires a clear understanding of the benefits and consequences, and the beliefs and concerns that are attached to the use of potent antiretroviral drugs (Horne, Buick, et al., 2004). Medical healthcare professionals rarely explore their patients' beliefs about drug treatment. Additionally, patients may complain about receiving ambivalent information about treatment, which only increases their anxiety and negative beliefs they hold towards prescribed drugs (Horne, Graupner, et al.,

2004). Beliefs people hold about illnesses and prescribed treatments influence their motivation to adhere to their prescribed treatment plan. Beliefs about medication have been shown to impede adherence to long-term medical treatment that consist of prescribed drugs (Horne, 1999). Stimson (as cited in Nobel, 1998) found that patients' misconceptions about prescribed treatments were related to patients' lower adherence. Some misconceptions held by patients included prescribed drugs should only be taken when a patient feels sick, the body needs a rest from prescribed drugs, and the body can become immune to the effects of the drugs from long term use of prescribed drugs. Studies have demonstrated that patients are likely to discontinue their drug therapy when they believe that the unnatural chemicals of drugs are slowly damaging their bodies. In line with this finding, women's decisions to be adherent to HAART are likely to be guided by their concerns about the drugs and their physical condition (Richter et al., 2002; Siegel & Gory, 1997). Consequently, values and beliefs that are learned from one's culture can also influence adherence.

HAART treatment successfully manages HIV and leads to an improved quality of life for many patients. Unfortunately, the benefits of HAART can only be attained when patients are 95% consistent with treatment. Both IPV and beliefs about medication have independently been associated with low adherence (Horne, Buick, et al., 2004; Lichtenstein, 2006). Therefore, this study sought to explore the following research question: Between beliefs about medication and IPV, which factor will account for the majority of the variance in adherence to HIV/AIDS treatment.

### Study Hypotheses and Research Question

Based on the research literature, the following hypotheses were made and research question was posed:

H1: It was hypothesized that indicators for IPV would be negatively associated with adherence.

H2a: It was hypothesized that participants who viewed their medications as not needed would be less adherent (e.g., a negative correlation between BMQ-Necessity and Adherence).

H2b: It was hypothesized that participants who had few concerns about their medications would be more adherent than those with more concerns (e.g., a positive correlation between BMQ-Concern and Adherence).

RQ1: This study was also designed to explore whether beliefs about medication or IPV accounted for more of the variance in adherence to HIV/AIDS treatment.

Correlational analyses were conducted to test all the study hypotheses. One linear multiple regression analysis was conducted in order to explore the research question. In this regression, IPV and beliefs about medication indicators were the predictor variables and the outcome variable was adherence.

### Method

#### *Participants*

This sample of (N=246) was drawn from the pre-intervention assessment of the Stress Management and Relaxation Training/Expressive-Supportive Therapy (SMART/EST) Women's Project. The participants were women over the age of 18 and living with HIV/AIDS, and were recruited from metropolitan areas (Miami, New York,

and New Jersey) located on the east coast of the United States. The participants in this sample ranged in age from 34 to 53 years, with the average age being 41 years old. The sample was predominately made up of African-American (41%) and Puerto Rican (27%) women who had incomes at the poverty level.

### *Measures*

*Belief about Medicines Questionnaire.* The Beliefs about Medicines Questionnaire (BMQ; Horne, Weinman, & Hankins, 1999) is comprised of two sections. The BMQ-Specific scale is designed to provide an index of individuals' beliefs about the *necessity* of their prescribed medication and their *concerns* about the potential adverse reaction of their medication. The BMQ-General provides an index of individuals' beliefs about the *general-harm* of prescribed medication and the *general-overuse* of medication by physicians (Horne, Weinman, & Hankins, 1999). Both scales are comprised of five items that represent views about medication and are relevant to most chronic illnesses and treatments. Additionally, each scale contains treatment specific items (Horne et al., 2004).

In this study, participants' beliefs about HAART were assessed using the BMQ-Specific scales. Participants rated their level of agreement with each item on a 5-point Likert scale ranging from 1 (*Strongly Agree*) to 5 (*Strongly Disagree*). The BMQ-Specific Necessity Subscale is comprised of eight items and contains questions such as "My health, at present, depends on these medicines" and "These medicines keep my HIV under control". One item on the necessity scale is reversed scored, which is "missing this medication for a day won't matter in the long run". The total scores for this scale can range from 8-40. Higher scores on the necessity scale suggest that one's prescribed

medicine is perceived as not necessary, and lower scores suggest that one's prescribed medicine is perceived as necessary. When computing the reliability of the necessity subscale item six, which is the reversed scored item, was discarded based on reliability analysis. Thus, this subscale was found to have a Cronbach's alpha of 0.88.

Subsequently, the Necessity Subscale used in this study is comprised of seven items.

The BMQ-Specific Concern Subscale is comprised of 11 items such as "Having to take these medicines worries me" and "Using these medicines is embarrassing". There are two items on the concern scale that are reversed scored, "I am unlikely to get a bad side effect from this medication in the next month" and "I have received enough information about anti HIV therapy". The total scores for this scale can range from 11-55. Higher scores on the Concern Subscale suggest that there is no concern about one's prescribed medicine and lower scores suggest that there is concern about one's prescribed medicine. The different range in scores between the two scales makes it possible to assess the patient's beliefs about the necessity of participants' medicine as well as concerns about participants' medicines (Horne et al., 2004). When computing the reliability of the Concern Subscale item 11, which is "the taste of this medication makes me feel unwell" was discarded based on reliability analysis. Thus, this subscale was found to have a Cronbach's alpha of 0.80. Subsequently, the Concern Subscale used in this study is comprised of 8 items.

*Conflict Tactic Scale.* The Conflict Tactic Scale (CTS; Strauss, 1979) is design to measure acts of violence that have been used, as a specific tactic, by a partner within an intimate relationship to resolve conflict. The CTS is comprised of three subscales, which are minor violence, severe violence, and verbal aggression. The CTS is an 18 item

questionnaire. Each participant rated the statements on a 7-point scale ranging from never, once, twice, 3-5 times, 6-10 times, 11-20 times, to more than 20 times in the last year. The participant's responses will be scored by summing across items. A high score will indicate that mild violence, severe violence or verbal aggression is a common occurrence and a low score will indicate that they are not a common occurrence. Based on reliability analysis and prevalence levels, this study will make use of items from all three subscales to represent indicators of IPV. Two items make up the Verbal Aggression Subscale (IPV-va; e.g., "Threatened to hit or throw something at him/her" and "Threw or smashed or hit or kicked something"). The Cronbach's alpha for the IPV-va was 0.84. Three items make up the Minor Violence Subscale (IPV-mv; e.g., "Any partner ever grabbed, or shoved you" and "Any partner ever slapped you"). The Cronbach's alpha for the IPV-mv was 0.80. Five items make up the Severe Violence Subscale (IPV-sv; e.g., "Any partner ever beat you up" and "Any partner ever used a knife or gun"). The Cronbach's alpha for the IPV-sv was 0.87.

Adherence to Anti-HIV Medications Questionnaire (Chesney et al., 2000).

Participants' adherence levels were assessed using the Adherence to Anti-HIV Medication Questionnaire. For the present study, the percentage of total self reported adherence was indexed by a single item indicator that reflects the level of adherence to prescribed medications over a three-year period.

### *Procedure*

The study sample was drawn from the Stress Management and Relaxation Training/Expressive-Supportive Therapy (SMART/EST) Women's Project, which was a project supported by NIH grant no. R01MH55463. The SMART/EST Women's Project

was designed to assess the use of stress management, coping and problem solving strategies, and cognitive-behavioral skills in improving ethnic minority women's ability to respond to the adversities of living with AIDS. The pre-intervention data from SMART/EST was used in the present study. This is a secondary data analysis. The primary data collection was approved by the University of Miami Institutional Review Board and participants provided informed consent prior to participation. Participants were also screened in order to meet the study inclusion/exclusion criteria. The study inclusion criteria included women who were 18 years or older, HIV seropositive, fluent in English, and had at least a 6<sup>th</sup> grade education. Participants were temporarily excluded if they had a diagnosis of depression, psychosis, or substance dependence.

## Results

### *Preliminary Analysis*

The normality of the main study variables showed that all variables were normally distributed except for the following: IPV-mv Subscale Score, IPV-sv Subscale Score, and the Adherence item. Skewness and kurtosis values for these variables exceeded an absolute value of two. Other analyses showed seven outlier cases. These cases are included in the analyses reported here. Listwise deletion showed that 51% of the sample had missing data on at least one of the main study variables. Frequencies of the study variables showed several out of range (n=33) values for the verbal aggression items. Coding errors were found and these errors were corrected in the dataset.

### *Hypotheses Related Correlational Analyses*

A Pearson's Product Moment Correlational Analyses were conducted with the study variables (See Table 1). Results related to hypothesis one indicated that the IPV-mv

Subscale Score was significantly and negatively related to adherence ( $r = -.18, p < .01$ ). The IPV-sv Subscale Score was also significantly and negatively related to adherence ( $r = -.17, p < .05$ ).

Other significant non hypothesis related findings showed the following: The IPV-mv Subscale Score was significantly and positively related to the IPV-sv Subscale Score ( $r = .93, p < .01$ ) and the IPV-sv Subscale Score was also significantly and positively related to the IPV-sv Subscale Score ( $r = .54, p < .01$ ). The IPV-sv Subscale Score was also significantly and positively related to the IPV-sv Subscale Score ( $r = .54, p < .01$ ). The BMQ Specific Necessity Subscale Score was significantly and negatively related to the BMQ Specific Concern Subscale Score ( $r = -.12, p < .05$ ).

Table 1

*Study Variable Correlations*

	IPV-mv	IPV-sv	IPV-sv	IPV-sv	IPV-sv	IPV-sv
IPV-mv	-	.93**	.68**	-.04	-.05	-.18**
IPV-sv		-	.54**	-.04	-.06	-.17*
IPV-sv			-	-.04	.05	-.09
IPV-sv				-	-.12*	-.05
IPV-sv					-	-.00
IPV-sv						-

*Note:* IPV-mv: Conflict Tactic Minor Violence Subscale; IPV-sv: Conflict Tactic Severe Violence Subscale; IPV-sv: Conflict Tactic Verbal Aggression Subscale; BMQ-N:

Beliefs About Medicine Questionnaire Necessity Subscale; BMQ-C: Beliefs About Medicine Questionnaire Concern Subscale; Adh: Anti-HIV Medication Questionnaire.

\* $p < .05$ , \*\* $p < .01$

#### *Research Question Related Analysis*

One linear regression analysis was conducted in order to explore the study research question. In the regression, the IPV-mv, IPV-sv, IPV-va, BMQ Necessity, and BMQ Concern Subscale Scores were the predictor variables and the outcome variable was adherence. The predictor variables accounted for less than 1% of the variance in adherence ( $R^2 = .06$ ). Beta weights indicated that the IPV-mv Subscale Score (std.  $\beta = .27$ ,  $p = n.s$ ), IPV-sv Subscale Score (std.  $\beta = .07$ ,  $p = n.s$ ), BMQ Necessity Subscale Score (std.  $\beta = -.13$ ,  $p = n.s$ ), and BMQ Concern Subscale Score (std.  $\beta = -.04$ ,  $p = n.s$ ) were not significant predictors of adherence.

#### Discussion

The present study was designed to investigate the relationship between intimate partner violence and beliefs about medication and adherence to HIV/AIDS treatment in a sample of ethnic minority women. This secondary data analysis was designed to contribute to the current knowledge base of HIV/AIDS treatment adherence among minority women. While there was a pattern of non-significance, the study findings showed significant relations between indicators of IPV and adherence in this sample.

Specifically, hypothesis one was that indicators of intimate partner violence would be negatively associated with adherence. This hypothesis was supported by the study results. However, correlational analyses revealed that only two of three IPV indicators, IPV-mv and IPV-sv, were negatively related to adherence. These statistically significant

findings may imply that minority women in this sample who have an intimate relationship, who are diagnosed with HIV/AIDS, and whose partner responds to conflict with minor or severe violence are likely to report less adherence to HIV/AIDS treatment than those women who do not experience such violence. These findings reaffirm previous research that has identified IPV as negatively associated with adherence to HIV/AIDS treatment (e.g., Cohen et al., 2004; Lichtenstein, 2006). Moreover, several studies have shown that women who are exposed to IPV exhibits low self-esteem, high levels of external locus of control, and feelings of helplessness ( e.g., Axelrod et al., 1999; Jones et al., 2003; Lichtenstein, 2006; Simoni & Ng, 2002). While this study did not assess for these factors, they have been shown to moderate the relationship between IPV and adherence. Thus, the decrease in women's confidence after being exposed to IPV has been negatively associated with the ability to make the life changes necessary to maintain high levels of adherence (Lichtenstein, 2006).

These significant findings between IPV and adherence also provides support for Wingood and DiClemente's (2000) social structure of sexual division of power, which is part of their extended version of Connell's theory of gender and power. This social structure notes that women, specifically minority women, who lack power within their relationships will also have limited control over changing their behaviors in a more desired direction. Furthermore, Moreno (2007) found that partners knowingly infect women to prevent them from leaving the relationship. In line with Moreno, Lichtenstein (2006) found that abusive partners have sabotaged their victim's efforts to seek care. Thus, it can be assumed that perpetrators of IPV may use denying access to treatment as another means of exerting power and control over their victims. Overall, the results of

hypothesis one are in line with other findings that have identified IPV as a significant factor that is negatively connected to successful adherence to HIV/AIDS treatment.

Hypothesis two was that participants who viewed their medication as not needed would be less adherent to HIV/AIDS treatment and participants who had few concerns about their medications would be more adherent to HIV/AIDS treatment. This hypothesis was not supported by the study results. Correlational analyses revealed that beliefs about medication as measured by the Necessity and Concern Subscales Scores were not significantly negatively related to adherence. This non-significance between beliefs about medication and adherence is in contrast to the literature on this topic (e.g., Horne, Buick, et al., 2004; Horne, Graupner, et al., 2004; Richter et al., 2002; Siegel & Gorey, 1997). Prior research has shown that patients' perception of the necessity of their medication and their concerns about potential adverse effects of their medications was significantly related to low levels of adherence.

One explanation for these differing findings may be attributed to the appropriateness of the Beliefs about Medicine Questionnaire (BMQ) as an optimal tool to accurately measure ethnic minority women's perceptions of the necessity and concerns about their HIV/AIDS treatment. The BMQ has typically been used with men and women, mostly men, of Asian and European cultural background and Whites with a homosexual sexual orientation (e.g., Horne, Buick, et al., 2004; Horne, Graupner, et al., 2004). Thus, the socio-demographic make-up (i.e., level of education and income) of prior BMQ samples was not similar to the present study sample. Another explanation for differential findings may be attributed to when participants began treatment and when the BMQ was administered. Horne, Cooper, Gellaitry, and Date (2007) found that clients

who initiate treatment are likely to perceive treatment as necessary and to have less concerns about adverse effects. However, they also found that adherence declined over time due to changes in the client's beliefs. The present study finding supports Horne et al., (2007) assertion that beliefs about medication may change over time. Additionally, adherence has been linked with one's level of motivation, and Robert and Mann (2000) have documented the role of emotional and social support in increasing motivation to adhere to treatment. In this study, the timing of the BMQ assessment and other related variables not included in the present analyses may have influenced the results.

Overall, the lack of significance found for hypothesis two (both hypothesis 2a and 2b) suggests a need for further research to enhance the understanding of how measurement may be influenced by cultural background particularly in how culture may relate to the decision making process that individuals go through when initiating and continuing long-term HIV/AIDS treatment. Moreover, it also highlights the importance of assessing a diversity of key variables over time.

The study research question was an exploration of whether indicators of IPV or beliefs about medication accounted for more of the variance in adherence to HIV/AIDS treatment in the present sample. The research question was posed based on the evidence provided by the literature that identified these variables as independently contributing to HIV/AIDS treatment adherence (e.g., Horne, Buick, et al., 2004; Lichtenstein, 2006; Richter et al., 2002). Thus, a closer examination of these variables in a combined regression model was a promising question to pose based on the research literature. This research question also had the potential to increase our knowledge of these important variables in an ethnic minority women sample and thereby expand the generalizability of

the present research literature. Based on the correlational analyses, IPV indicators were found to be significantly and negatively related to adherence. Therefore, a regression analysis with IPV and beliefs about medication indicators could lend insight to predicting adherence in the present sample. The regression analysis revealed that the model accounted for less than 1% of the variance in adherence. The results imply that neither IPV nor beliefs about medication were significant predictors of adherence to HIV/AIDS treatment in the present sample. Both IPV and beliefs about medication have independently been associated with low adherence (Horne, Buick, et al., 2004; Lichtenstein, 2006). Statistical models that include all of these constructs in ethnic minority female samples are scarce in the published research literature. Although it was likely that these indicators would be significant predictors of adherence in this sample, there is a diversity of reasons for the non-significant regression finding. Because these reasons and directions for future research have implications for the study on a whole, they are explored in the Limitations and Future Directions subsection below.

In summary, the main finding of this study was that IPV was significantly and negatively related to adherence in the sample. This finding is consistent with previous research (e.g., Axelrod et al., 1999; Cohen et al., 2004; Jones et al., 2003; Simoni & Ng, 2002). Indicator beliefs about medication, within this sample, were not related to adherence. This non-significant finding is not consistent with the research literature (e.g., Horne, Buick, et al., 2004) and may highlight the potential need for additional psychometric study of the BMQ in diverse samples that include ethnic minority women. Overall, IPV and beliefs about medication were non-significant as predictors of

adherence. The present study contributes to the literature by examining an array of IPV indicators and beliefs about medication in a sample of ethnic minority women.

### *Limitations*

There were two main limitations to this secondary data analysis. The first limitation was the use of a self-report questionnaire as the only method used to measure adherence. The use of one method increases the risk of over estimation of adherence. Thus, in this sample social desirability may have influenced the analyses and limited variability in the reporting of adherence. Although this method has been identified as the most common way to measure of adherence, it has been demonstrated that individuals' self-reports sometimes over estimate adherence (Bangsberg et al., 2001). Adherence should be measured with the use of a combination of methods to limit the over estimation of adherence (Bangsberg et al., 2001; Chesney et al., 2000). The second limitation of the present analysis was the substantial percentage of missing data (51% missing data according to listwise deletion on the continuous study variables). With this level of missing data missing, there may have been less variability among the scale scores and this may have influenced the present results including those reported non-significant results.

### *Directions for Future Research*

Most of the research on adhering to treatment has revealed that adherence is complex and can be easily complicated by competing negative aspects of daily living (e.g. Lichtenstein, 2006; Wright, 2000). Thus, directions for future research include examining the role of other variables on HIV/AIDS treatment adherence. Researchers should include other variables such as self-efficacy, depression, and anxiety in the tested

statistical models that deal with IPV, beliefs about medication, and adherence. Studies have shown that independently these other variables (e.g., self-efficacy, depression, and anxiety) are related to adherence and intimate partner violence (e.g., Axelrod et al., 1999; Jones et al., 2003; Lichtenstein, 2006). These factors may be stronger predictors of adherence and may account for more of the variance in adherence than IPV and beliefs about medication.

Despite the pattern of non-significance found between IPV, beliefs about medication, and adherence in the regression analysis, researchers should continue to explore the relations between these variables. An optimal design would be a longitudinal study designed to assess any changes in exposure to violence, beliefs about medications and other psychological and daily living environmental factors that could account for changes in adherence over time. It would also be important for future researchers to assess whether participants have a history of discontinuing treatment. Furthermore, replication of the present analysis would benefit from the use of at least two indicators of adherence, which would aid in better understanding social desirability and adherence reporting.

Future researchers of HIV/AIDS treatment adherence may consider exploring the differences in beliefs about medication between men and women. Women are likely to experience more adverse effects to HIV/AIDS treatment compared to men (Shibuyama et al., 2006). Thus, there may be differences between men and women in their concerns about medication and treatment more generally. Additionally, future researchers should also consider examining how cultural beliefs within large ethnic groups may vary in relation to beliefs about medication and adherence (e.g., African-Americans, Afro-

Caribbeans and within Latino/a subgroups). Continued exploration of these issues will enhance researchers' and clinicians' knowledge of the dynamics associated with HIV/AIDS treatment adherence and the capacity for patients to live with the virus.

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