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# Treatment Adherence Among Women Infected With Human Immunodeficiency Virus With a History of Gender-Based Violence

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# Walden University

College of Health Sciences

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Olivia McGregor

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2016

Abstract

Treatment Adherence Among Women Infected With Human Immunodeficiency Virus

With a History of Gender-Based Violence

by

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MPH, Walden University, 2011

BS, The University of Memphis, 2005

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health-Epidemiology

Walden University

November 2016

## Abstract

Women infected with Human Immunodeficiency Virus (HIV) are at high risk of a myriad conditions, especially gender-based violence (GBV). GBV can be a hindrance to treatment adherence, which is pertinent to improving the health of people living with HIV. The purpose of this longitudinal research study was to assess the effects of GBV on treatment adherence among HIV infected women, with specific focus on when the violence occurred (recent or lifetime) and the stratifying type of GBV (sexual, physical, and psychological). The health belief model (HBM) served as a theoretical groundwork. Participants were selected from secondary data, collected by the Women's Interagency HIV Study (WIHS), and divided into 2 groups: HIV-infected women who have experienced GBV and HIV-infected women who had not. Survival analysis, specifically the Cox proportional hazards model, was used to determine whether sexual, physical, or psychological GBV and recent or lifetime GBV influenced treatment adherence along with race, income, education, and substance use. Physical GBV was found to lower adherence, and childhood physical violence had a more significant effect on adherence than recent violence. Previous drug use, smoking, and missed doses in the past 30 days were strong predictors of non-adherence. Future research should explore barriers to adherence based on the type of abuser as well as comorbidity of other conditions. Identifying and addressing issues and conditions that impact women infected with HIV can improve their quality of life while providing help for other challenges these women face throughout their lives.

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## Dedication

This dissertation is dedicated to my family who has encouraged me to pursue my dreams from the beginning. Thank you for being understanding and supportive of me throughout this endeavor.

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## Chapter 1: Introduction to the Study

### **Introduction**

Gender-based violence (GBV) and Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) are two public health problems that place many women at high risk. Of the new HIV infections in the United States among women, 64% were African American, 18% were Caucasian, and 15% were Hispanic/Latina (Centers for Disease Control & Prevention, 2016b). African American women who experience gender-based violence (GBV), especially interpersonal violence (IPV), are at risk for contracting HIV along with poor health outcomes after HIV infection (Rose, House, & Stepleman, 2010). Similarly, HIV-positive women are at a greater risk of violence than HIV-negative women, specifically after HIV disclosure (WHO, 2005). GBV has been closely linked with HIV along with many other mediating factors such as depression, suicide ideation, substance abuse, and poverty (El-Bassel et al., 2011a, El-Bassel et al., 2011b, McLaughlin et al., 2011; Schafer et al., 2012). There are many studies that examine HIV or GBV in conjunction with many of these mediating factors, but few that directly investigate GBV and HIV together. In addition, most research studies focused on the impact of GBV before HIV infection and not on the impact of GBV after HIV infection had occurred. Abusive relationships and violence can be an ongoing problem for many women infected with HIV.

Treatment adherence is important to the health and welfare of HIV-positive individuals. Not adhering to HIV treatment leads to increased HIV transmission, high viral loads, drug resistance, quicker progression to AIDS, and even death (Olem et al., 2014; Rose et al., 2010;). Women who have experienced gender-based violence are less

likely to adhere to HIV treatment or seek HIV care for fear of violence, stigma, or mistrust of healthcare professionals (Mills et al., 2006). Without HIV treatment, these women are more vulnerable to transmission of HIV including resistant strains of the virus, and contracting other sexually transmitted infections (STIs), which can also worsen health outcomes and quality of life. I conducted this study to investigate whether GBV was a barrier to treatment adherence among women infected with HIV.

The implications for positive social change for this study include adding to previous research to determine the importance of GBV screening for HIV-positive women. Women infected with HIV are at a greater risk for violence especially after they disclose their HIV status to others (El-Bassel et al, 2011a; Mittal et al., 2011; Schwartz et al., 2014). Fear of violence and HIV stigma may hinder these women from seeking HIV care and receiving the necessary treatment to improve their health and quality of life. This study can provide evidence of the issues that HIV-positive women face when dealing with violence and treatment adherence. Routine screening is necessary to help abused women initiate treatment and effectively manage their disease. Furthermore, many GBV victims who are HIV-positive may suffer from other conditions such as mental illness and substance abuse, which must also be addressed for HIV treatment to be effective.

Treatment adherence is a serious issue within health care, especially among people infected with HIV. The effectiveness of highly active antiretroviral therapy (HAART) is decreased with poor adherence. Poor adherence leads to higher mortality, drug resistance, higher healthcare costs, diminished quality of life, and lower chances of

survival (Olem, Sharp, Taylor, & Johnson, 2014). Adhering to HIV medication regimens is a necessity to decrease viral loads and disease transmission. There are several hindrances that exacerbate the problem of treatment non-adherence such as severe side effects, complexity of regimens, stigma, poverty, housing instability, emotional instability, lack of support, and negative perceptions of treatment effectiveness (Olem et al., 2014). Finding ways to combat these obstacles can help improve treatment adherence among people living with HIV/AIDS.

HIV along with gender-based violence (GBV) are public health problems among women, especially African American women. Sixty-four percent of new HIV cases are African American women (Bent-Goodley, 2014). According to the Centers for Disease Control & Prevention (2016a), the rate of HIV infection among African American women is 20 times higher than the rate of infection for Caucasian women and 5 times higher than in Hispanic/Latina women. HIV-positive women are at a higher risk of IPV (El-Bassel et al., 2011a). Women with these conditions are less likely to have access to resources that will improve their health or safety and are less likely to consider adhering to medication as a priority.

My goal in this study was to ascertain whether GBV was a barrier to HIV treatment adherence among women infected with HIV using the Health Belief Model (HBM) as a theoretical foundation. The HBM theorizes that perceptions and beliefs determine health behaviors that can either prevent or increase the risk of developing a disease or condition (Glanz et al., 2008). I used a secondary dataset collected from Women's Interagency HIV Study (WIHS), which is a national study investigating the

impact of HIV on women (Statepi et al., n.d). In order to measure GBV among the WIHS cohort, I divided participants into two groups based on retrospective experiences with GBV and treatment adherence. The only difference between the two groups was that members of one group had a history of GBV and the other group did not. The groups were similar according to the other variables such as age, socioeconomic status, HIV status, education level, and HIV treatment regimen.

There were several underlying assumptions pertaining to this study. One assumption was that participants engaging in research studies are more likely to have high adherence rates (Bacon et al., 2005). Women in research studies are often held accountable for treatment adherence, and medical visits as well as the provider-patient relationship can increase the likelihood of adherence to treatment. There may have been other social and economic factors involved that interfered with the participants' ability to adhere to treatment. Participants in the WIHS were kept within the study whether they adhered to treatment or not. Thus, treatment adherence was an appropriate variable to investigate in the WIHS cohort because adherence was not certain for all participants in the study.

In this study, I examined the influence of sexual, psychological, and physical GBV on adherence to treatment among women in the WIHS cohort. The time of exposure to GBV was also investigated because lifetime and childhood violence may have a different impact on treatment adherence than recent exposure to violence. Women who had experienced GBV throughout their lives may view violence as the norm in relationships and develop resilience behaviors to cope with abuse (Dale et al., 2014).

Women exposed to recent GBV may not be able to handle the trauma and stress, which can be a hindrance to positive health behaviors such as adhering to treatment. The inclusion criteria I used for selecting participants were female gender, HIV-positive status, with or without a history of GBV, and taking HIV medications. Exclusion criteria included HIV-negative status. It was important that women of all ethnicities be included in the target population to demonstrate a more representative sample of HIV-positive women.

I directly investigated whether there was a link between GBV and treatment adherence among women infected with HIV/AIDS. In previous studies, researchers have only included GBV as a confounding factor while examining other associations surrounding HIV/AIDS (El-Bassel et al., 2011a; Illangasekare et al., 2012). Outcomes from this study could inform physicians on issues and conditions that women infected with HIV/AIDS face on a daily basis. GBV screening should become a routine part of HIV care and should be used to help improve interventions that focus on treatment adherence. Improving HIV care for people living with HIV/AIDS can enhance their well-being and quality of life.

### **Background**

As of 2011, 23% of HIV-infected individuals were women (CDC, 2016b). Taking HIV medications is a necessity for the welfare of people living with HIV/AIDS to prolong life and increase viral suppression. Treatment non-adherence increases the likelihood of drug resistance, which can make managing HIV disease more difficult (Kalichman et al., 2001). There are many barriers to treatment adherence among women

such as mental illness and substance abuse (El-Bassel et al., 2011a, El-Bassel et al., 2011b). These issues can impair judgment as well as exacerbate health problems. Mental illness and substance abuse also lead to poor judgment in violent relationships. Women under the influence of addictions and emotional instability may not see violence as a threat to their health and safety.

Women who are infected with HIV are at an increased risk for violence, especially GBV or IPV with one in four women being involved in a violent incident at some point in their lives (McLaughlin et al., 2012). GBV can leave physical and emotional scars that victims must struggle with long after violent acts have occurred. These scars can cause mental anguish, such as addictions, mental disorders, low self-esteem, and anxiety, which can manifest through physical conditions (Schwartz et al., 2014). Social conditions such as poverty, low income, and lack of an education can increase the likelihood of violence as well as make leaving a violent relationship difficult. Women in abusive relationships are powerless against their male partners. These women depend on their male partners for survival along with emotional support. Many of these women have grown up seeing violence in the household, and therefore, perceive violence in relationships as the norm. Handling GBV may hinder these women from seeking and receiving the care necessary to manage HIV. Outcomes of GBV can include delayed entry into care, missed appointments, high viral loads, faster disease progression, and even death (Aziz & Smith, 2011; Illangasekare et al., 2011; Schafer et al., 2012). All of these outcomes can cause treatment non-adherence, which can lead to adverse health outcomes in women infected with HIV/AIDS.

In previous studies, researchers have not directly examined the influence of GBV in treatment adherence among HIV-positive women (Blashill et al., 2012; Boarts et al., 2006; El-Bassel et al., 2011b; Mill et al., 2006). Most have investigated other variables along with GBV or HIV such as mental illness, social support, or substance abuse. Little information exists specifically on the relationship between GBV and treatment adherence together in the presence or absence of other mediating factors. In addition, these studies that have been conducted lack the sample size needed to provide strong evidence that a significant relationship exists between GBV and HIV treatment adherence. Larger sample sizes can effectively demonstrate the impact of GBV on the health of women from various socioeconomic backgrounds, U.S. states, ages, and chronic health conditions. These factors may also play a role in the relationship between GBV and treatment adherence, which can provide further insight into the lives of women dealing with HIV.

This study was needed to investigate the relationship of GBV and HIV treatment adherence in women from a national cohort while controlling for race, socioeconomic status, age, and other health conditions. The sample population was from the Women's Interagency Study, which recruits women from several cities around the U.S. This representative sample provided information on treatment adherence among women infected with HIV especially those with a history of violence, specifically physical, emotional, and sexual violence.

### **Problem Statement**

Women are a growing population among those infected with HIV and account for 20% of new HIV infections (CDC, 2016f). These include women who are African American, American Indian and Alaskan Natives, Asian, Hispanics/Latinas, and Native Hawaiian and Other Pacific Islanders. African American women are disproportionately affected by HIV/AIDS relative to other ethnic groups of women. Twenty-nine percent of new HIV infections in 2010 were among African American women (CDC, 2016a). These women are also at an increased risk for adverse health outcomes. Of HIV infections among other ethnicities, 16% were Asian women, 15% were Latina women, 22% were American Indians and Alaska Natives, and 22% were Native Hawaiians and Other Pacific Islanders (CDC, 2016a-e). GBV is another common public health problem among women with more than 10% of women having reported GBV within the previous 12 months (McLaughlin et al., 2012). GBV and HIV are high risk factors for women. Intersecting risk factors for GBV and HIV include emotional instability, substance abuse, multiple sexual partners, low self-esteem, and violent relationships. Evidence that women who are victims of GBV are at a greater risk for HIV infection is well-documented (Barros et al., 2011; El-Bassel et al., 2011a; Sareen et al., 2009; Schafer et al., 2012). GBV victims, who are also HIV-positive, may have other challenges that cause accessing HIV care more difficult. Treatment adherence is a crucial component of HIV treatment. To enhance health outcomes for people living with HIV/AIDS, HAART must be taken as prescribed (Schafer et al., 2012). Women's health and HIV care delivery should

prioritize aiding women in leaving violent, unhealthy relationships as well as adhering to HIV medications.

Women who are victims of GBV struggle with a myriad of stressful conditions that can lead to negative health outcomes. Violence-exposed women can suffer from depression, post-traumatic stress disorder, drug addiction, self-esteem issues, and anxiety (El-Bassel et al., 2011a). These issues can also be coping mechanisms created to help victims deal with violence. Mental illness and substance abuse can impair judgment, and impaired judgment can affect an individual's desire or ability to seek HIV testing and treatment, access to care, or adhere to treatment (El-Bassel et al., 2011a). Treatment adherence is needed to improve health outcomes and prolong the lives of HIV-positive individuals (Schafer et al., 2012). Barriers should be reduced or eliminated so that HIV-positive women who experience GBV can receive treatment for their illness and treatments for other conditions (Aziz & Smith, 2011). GBV impacts the health of HIV-positive women, but extant studies are limited in their findings regarding differences in GBV (sexual, psychological, and physical) and the time which GBV occurred (childhood abuse, lifetime exposure, or recent exposure) (Barros et al., 2011; Illangasekare et al., 2012). In this research study, I examined the effect of the types of GBV on treatment adherence in HIV-positive women to address a meaningful gap in the literature.

### **Purpose of the Study**

My objective of this quantitative, case-control study was to utilize the Health Belief Model (HBM) to examine any association of GBV as it related to being a barrier to treatment adherence among HIV-positive women who had experienced GBV and those

who had not, controlling for race, age, education, and socioeconomic status. Participants were recruited from the Women's Interagency HIV Study (WIHS) Cohort. The independent variable, gender-based violence, was defined as physical, psychological, and sexual violence. The dependent variable, treatment adherence, was defined as taking medication as prescribed, and the control variables race, age, education, socioeconomic status, mental illness, marital status, and substance abuse was defined as ethnicity- African American, Latina, etc.; between 19-89 years of age; level of education completed; and annual income/salary; presence of mental illness or symptoms; married, not married and living together, widowed, divorced or marriage annulled, separated, never married, and other; and engaging in substance abuse whether previously or presently, respectively.

### **Research Questions and Hypotheses**

I designed the following questions and associated hypotheses to guide the research:

Research Question 1: To what extent does gender-based violence affect treatment adherence among women infected with HIV after controlling for race, age, education, socioeconomic status, mental illness, and substance abuse?

H<sub>10</sub>: Gender-based violence does not affect treatment adherence among women infected with HIV.

H<sub>1a</sub>: Gender-based violence does affect treatment adherence among women infected with HIV.

Research Question 2: To what extent does the time of exposure to gender-based violence (lifetime violence or recent experience), stratifying for various types of recent gender-based violence (sexual, physical, and psychological) impact treatment adherence among HIV-positive women after controlling for race, age, education, socioeconomic status, mental illness, and substance abuse?

H<sub>20</sub>: The time of exposure, (lifetime or recent exposure) to gender-based violence does not affect treatment adherence among women infected with HIV, stratifying for various types of GBV (sexual, physical, and psychological).

H<sub>2a</sub>: The time of exposure (lifetime or recent exposure) to gender-based violence does affect treatment adherence among women infected with HIV, stratifying for various types of GBV (sexual, physical, and psychological).

Research Question 3: To what extent do women infected with HIV differ in treatment adherence across the three types of gender-based violence (sexual, physical, and psychological)?

H<sub>30</sub>: There are no differences in treatment adherence between women infected with HIV across the three types of gender-based violence (sexual, physical, and psychological).

H<sub>3a</sub>: There are differences in treatment adherence between women infected with HIV across the three types of gender-based violence (sexual, physical, and psychological).

I measured the variables from questions on the WIHS questionnaires, which included items on treatment adherence and exposure to GBV.

### **Theoretical Framework**

The Health Belief Model (HBM) was created in the 1950s by social psychologists in the U.S. Public service to explain the reasons why people continued negative health behaviors despite the risk or contraction of various diseases such as tuberculosis (Glanz, Rimer, & Viswanath, 2008). Although, there are numerous strategies to prevent and treat disease, many individuals ignore these recommendations to improve their welfare and healthcare. The HBM has several constructs such as susceptibility, seriousness, benefits, barriers, cues to action, and self-efficacy (Glanz et al., 2008). Susceptibility is the risk a person has of developing a disease or condition. Seriousness is the magnitude of the disease or condition in relation to one's health and well-being. Benefits are the rewards or outcomes that occur due to adopting positive health behaviors or eliminating negative behaviors. Barriers are the obstacles that arise due to behavior change. Cues to actions are events that trigger or initiate behavior change. Lastly, self-efficacy is the motivation that empowers an individual to adopt positive behavior change and maintain that change throughout life. The HBM lays the groundwork for understanding the mental processes of behavior change to improve health and social conditions.

I used the HBM in my approach to investigate the issues that surround treatment adherence among abused women infected with HIV. GBV is a multi-faceted issue that includes many factors such as emotional instability, substance abuse, poverty, and self-esteem (Barros et al., 2011; Blashill et al., 2012; El-Bassel et al., 2011b). These factors play a role in how women exposed to GBV, especially IPV, cope with their situation along with seeking help. Sexual, psychological, and physical IPV may be barriers to

treatment adherence among HIV-positive women. Further, these barriers may be related to how long the exposure of GBV has been present in women's lives. These issues concerning GBV may be barriers to treatment adherence and may hinder HIV care needed to improve the health conditions of victims. Finding the reasons why treatment adherence is an issue among HIV-positive women may improve healthcare delivery options for this population.

Many theories have been applied to study the association between GBV, HIV, and treatment adherence. The Information-Motivation-Behavioral Skills Model (IMB) posits that information about a particular disease motivates positive behavior change and empowers people to initiate the behavior change along with continuing the behavior change for the rest of their lives (Fisher, Amico, & Harman, 2006). Women who are HIV-positive and victims of GBV may be motivated to leave violence behind and make informed choices about their health. Knowledge on how GBV is detrimental to physical and mental health can motivate and empower women to make the necessary changes to improve their health and quality of life through seeking medical treatment and counseling, and building non-violent, healthy relationships. The theory of gender and power, developed by Robert Connell, is a theory based on a social construct of sexual inequality and gender imbalance, which helps to explain how women's lack of power in relationships and society forces them to stay in abusive relationships that can harm their mental and physical well-being (Wingood & DiClemente, 2000; Manfarin-Ledet & Porche, 2003). The lack of power in relationships causes women to engage in risky behaviors and instills a feeling of hopelessness, which can cause women to not seek or

adhere to treatment. Suicidal thoughts and behaviors may also be a product as well as a contributor to the deterioration of HIV-positive women's health.

### **Nature of the Study**

The methodology for this research study was a quantitative design with a secondary dataset collected from the WIHS. The WIHS collects data on social characteristics, treatment adherence, risky sexual behaviors, condom use, obesity, smoking, and substance abuse among HIV-positive and HIV-negative women (WDMAC, 2013). Providing numerical data to demonstrate relationships and trends among variables, such as treatment adherence and violence exposure for example, is the primary purpose of quantitative research methods (Creswell, 2013). The WIHS dataset I used covered years 1994 through 2011.

To accurately measure gender-based violence or GBV, which was the independent variable, I used a nonequivalent control group with a longitudinal design to examine GBV as a predictor to treatment non-adherence in women infected with HIV among a secondary dataset from the Women's Interagency HIV Study (WIHS). I divided the secondary dataset from the cohort into two groups: HIV-positive women who had experienced GBV (experimental group) and HIV positive women who had not experienced GBV (control/comparison group). Participants meeting the following criteria were selected through convenience sampling. For the experimental group, criteria included: HIV-positive status, a history of abuse or recent exposure to GBV, and on a HIV medication regimen. For the control/comparison group, criteria included: HIV-positive status, on HIV medications, and no history of abuse or recent exposure to GBV.

Using a longitudinal research design with nonequivalent groups allowed me to examine treatment adherence over time among HIV-infected women exposed to GBV. Since GBV was the variable of interest between the two groups, random selection was not feasible, therefore I had to use the nonequivalent control group design.

The independent variable(s) was sexual, psychological, and physical GBV. The dependent variable, treatment adherence, was taking medications as prescribed. Co-variables were age, education, socioeconomic status, mental illness, and substance abuse.

### **Definitions**

*Age:* Defined as number of years of the participants from birth to date of survey.

*Education:* The highest level of education completed such as high school, college, masters, and/or professional degree.

*Gender-based violence (GBV):* Violence or abuse that causes a woman physical, sexual, or psychological harm, which includes deprivation of civil liberties in both public and private domains (HHRI, n.d.). GBV is the umbrella term for violence against women which includes intimate partner violence, childhood abuse, rape, financial abuse, etc. There are three different types of GBV: sexual, physical, and psychological or emotional.

*Highly active antiretroviral therapy (HAART):* A combination of medications used to treat HIV/AIDS.

*Hazardous drinking:* A behavior in which an individual drinks more than four alcoholic beverages in a day or more than seven in a week (Cook et al., 2009).

*Intimate partner violence or interpersonal violence (IPV):* Violence or abuse where a spouse or significant other is the perpetrator (WHO, 2004).

*Lifetime violence:* Gender-based violence that has occurred throughout a woman's lifetime. Ranging from birth to 12 months prior to date of data collection.

*Mental illness:* Defined as symptoms related to PTSD, depression, anxiety, and suicidal behavior (El-Bassel et al., 2011b; McLaughlin et al., 2012).

*Physical GBV:* Violence including being slapped, kicked, punched, pushed, assaulted with a weapon, and homicide (WHO, 2004).

*Psychological/emotional GBV:* Verbal abuse (ridiculing the woman, threats), isolation (hindering from seeing family or friends), intimidation, withholding resources (preventing an education), and inhibition from working or confiscating her wages (WHO, 2004). Also called domestic coercion.

*Recent violence:* Gender-based violence that has occurred within the last 12-months prior to data collection.

*Sexual GBV:* Rape, coercion to have sex, unwanted touching or physical advances, forced participation in pornography, degrading acts, and any other sexual behaviors that are accompanied by threats from a perpetrator (World Health Organization, 2004).

*Socioeconomic status:* Household income level.

*Substance abuse:* The illegal use of drugs such as marijuana, cocaine, heroin, methamphetamines, and prescription medications (El-Bassel et al., 2011a).

*Treatment adherence:* Also called medication adherence, this term refers to taking HIV medications as prescribed including the correct times and routes of administration.

### **Assumptions**

The WIHS cohort is comprised of African American, Caucasian, Asian, Native American, Alaskan Native, Pacific Islander, and Latina women from multiple sites throughout the United States, which increases the representativeness of the study sample to the HIV-positive female population (Bacon et al., 2005). There are approximately 11 participating sites in San Francisco, CA; Los Angeles, CA; Chicago, IL; Brooklyn, NY; Bronx, NY; Baltimore, MD; Washington, D.C.; Chapel Hill, NC; Birmingham, AL; Jackson, MS; Atlanta, GA; and Miami, FL (WDMAC, 2013). African American women are at a higher risk for contracting HIV/AIDS and are disproportionately affected by the disease compared to other ethnic groups. For the purpose of this study, all HIV-positive women in the WIHS cohort, regardless of ethnicity, were examined to determine the relationship between GBV and treatment adherence within the sample. I also explored racial differences in treatment adherence.

HIV treatment is prescribed to all HIV-positive individuals seeking care. Access to care and quality treatment is essential for people living with HIV/AIDS to improve their health and welfare. Individuals involved in research studies are provided access to care and may be at an increased advantage to receiving quality healthcare and information to make informed choices about their health and disease management. One assumption I made was that research participants are more likely to adhere to treatment and have better health outcomes because of their increased interactions with healthcare professionals. For the WIHS cohort, participants are allowed to continue in the study regardless of their adherence to HIV medications (Bacon et al., 2005). Thus, participation

in the WIHS study does not necessarily guarantee adherence to treatment. Treatment adherence is a suitable variable to examine in this cohort because research participants may still not take medications as prescribed while engaging in research.

Violence can have many negative effects on the health of abused women. Women who experience violence have more hospitalizations from the physical and psychological trauma (Siemieniuk, Krentz, & Gill, 2013). Having multiple entry points to care can provide abused women with access to resources, which can help them to get out of violent relationships and improve their health. Women exposed to GBV who are also infected with HIV often have mental health disorders, addictions, and a faster progression to AIDS (Siemieniuk et al., 2013). Although abused HIV-positive women seek medical help for physical and sexual abuse, they may still be at risk for more abuse and other adverse health outcomes. Physicians treat the scars, bruises, broken bones, and other physical injuries incurred by GBV; and ask questions pertaining to violence, but women exposed to GBV must be willing to accept help from healthcare professionals in order to leave violent relationships and make more informed choices about their health.

### **Scope and Delimitations**

There are many barriers to treatment adherence among HIV-positive women. GBV may be one such barrier that hinders women infected with HIV from taking their medications as prescribed. Sexual, psychological, and physical GBV may have different negative outcomes on women with HIV. I investigated the various effects that sexual, psychological, and physical GBV has on treatment adherence. The effects of sexual, psychological, and physical GBV may be the same or different among the sample

population. Additionally, the length of exposure may also have an effect on HIV treatment adherence. Women who have experienced a lifetime of abuse may have different attitudes and skills when dealing with HIV disease management and adherence to treatment. Examining the outcomes by type of GBV along with the length of GBV exposure on a sample of HIV-positive women can help to explain the physical and social conditions of abused women who are also infected with HIV. Very few studies differentiate between the type of GBV or IPV studied (sexual, physical, or psychological) or whether the exposure to violence was during childhood or more recent (Illangasekare et al., 2012; Mittal et al., 2013; Sareen et al., 2009; Schafer et al., 2012). These studies also do not look at these two factors together. It is important that both the type of GBV experienced and the length of time of exposure be examined in concert to provide more insight into the relationship of GBV to HIV infection and treatment adherence. Investigating the barriers to treatment adherence can help provide insight into how to improve the health and welfare of HIV-positive individuals and reduce transmission of the disease.

The sample population for this study included women from the WIHS cohort who were HIV-positive from various racial backgrounds, some of whom had a history of GBV and others of whom did not, and were taking highly active antiretroviral therapy from the WIHS cohort. Populations excluded from this study were women not infected with HIV. Twenty-three percent of people living with HIV in the United States are women (CDC, 2016b). Learning the issues affecting this particular population can help improve interventions to reduce the incidence of HIV among women.

This study may be applied to other populations of HIV-positive women of various socioeconomic backgrounds. Social and financial conditions women must deal with include poverty, minimal education, discrimination, racism, and sexism. Determining the outcomes of GBV on treatment adherence will help explain issues among women infected with HIV as well as ways to enhance interventions to improve adherence among HIV-positive women. Improving adherence and reducing HIV transmission is a chief public health concern.

### **Limitations**

The secondary data that I used in this study was self-reported data. Questionnaires and interviews were used in the WIHS to gather information on the social and health conditions of HIV-positive women on highly active antiretroviral therapy (WDMAC, 2013). It is hard to determine whether self-reported data is reliable without verifiable documentation. With self-reported data, it is not clear whether the information obtained is accurate. I used convenience or purposive sampling to recruit participants. Random sampling was not feasible for this study. To accurately measure the impact of GBV on treatment adherence, I assigned participants to groups based on past and recent experiences of GBV and treatment adherence. While there were several questions discussing sexual and physical GBV within the WIHS questionnaires, there was only one question within the WIHS dataset that covers psychological violence. Psychological or emotional GBV includes verbal threats, belittling, forced isolation from family and friends, intimidation, withholding resources, and preventing a woman from working or receiving her wages (WHO, 2004). Psychological violence may be difficult to measure

because it is based on perception. GBV victims may not perceive their partners as being verbally abusive or understand what constitutes as psychological GBV. One question on the topic may not have been enough to accurately ascertain psychological GBV within the dataset.

Self-reported data is prone to bias. Participants may not accurately recall past experiences of GBV, especially those that occurred during childhood. Furthermore, recall bias can be an issue with treatment adherence. Women taking HAART for many years may not have the ability to recall whether they have always taken their HIV medications as prescribed. Convenience sampling also presents a potential bias. Assigning participants to groups based on past experiences with GBV and treatment adherence rather than by chance minimizes the generalizability of the results. Confounding variables can also be an issue. Confounding variables such as PTSD, depression, substance abuse, and poverty can bias the outcomes by interfering with the association of GBV on treatment adherence (Statepi et al., n.d.).

Along with self-reported data from the questionnaires, the WIHS also collects data through physical examinations such as physicals and blood tests (Statepi et al., n.d.). These physical examinations can provide as additional information to either support or refute the self-reported data provided on the WIHS questionnaires. Since convenience sampling was the only feasible sampling method for this study, I used matching to ensure that the participants in both groups were similar to minimize the interference of confounding variables. Matching allowed me to organize participants according to demographic characteristics such as education, age, and income to reduce the likelihood

of these variables interfering with the study (Creswell, 2013). Matching also increased the external validity of the study in the absence of random sampling. Additional verifiable data and matching participants were effective strategies to minimizing the effects of the research design and methodological limitations in this study.

### **Significance**

Knowledge on the impact of the different types of GBV and length of GBV exposure is very limited in previous literature. Examining the direct relationship between GBV and treatment adherence among HIV-positive women in a large sample population was my main goal for this research study, and I sought to add to the existing body of knowledge of violence against women and HIV treatment adherence. Sareen, Pagura, and Grant (2009) examined the prevalence of IPV among new HIV infections among women in a large representative sample and discovered that 12% of new HIV infections are attributable to IPV. The researchers also found that women in the sample population had issues of PTSD, depression, and substance abuse. Mental disorders such as PTSD and depression are very common among victims of violence (El-Bassel et al., 2011b). These issues can also affect HIV-positive individuals' access to treatment. IPV, along with mental disorders and substance abuse, can lead HIV-positive individuals to not seek or comply with treatment, and can restrict their access to care. Women who experience violence can have difficulty adhering to HIV treatment, which can reduce viral loads and increase HIV transmission among this population and those uninfected (Schafer et al., 2011). Most studies on this topic are limited in examining the effects of lifetime exposure to violence along with the effect this type of violence has on HIV-positive women.

Duration of exposure and whether the violence is sexual, physical, or verbal may also be a factor in treatment adherence and should be explored. Several researchers have examined substance abuse and HIV risk where IPV also played a role in the relationships of drug-addicted women and their partners (El-Bassel et al., 2011a; Illangasekare et al., 2012). Women who used drugs were at a higher risk of contracting HIV and were not seeking treatment for fear of disclosing their HIV status to partners, and in so doing experiencing retaliation in the form of violence or rejection by their partners (El-Bassel et al., 2011a). The main issues that increase women's risk of contracting HIV also play roles in their lives after HIV infection. The same behaviors women exhibit before contracting the disease usually continue after transmission and contribute to conditions that increases transmission to others.

This study helped to better identify whether there is a link between GBV and HIV without the interference of other confounding factors. Previous literature included GBV, IPV, HIV risk, or HIV infection along with mental disorders, substance abuse, alcohol, access to care, and support from partners and spouses. PTSD and depression can also be risk factors for GBV among HIV-positive women. In a cross-sectional study, Illangasekare (2012) found that 27% percent of the study population suffering from depression was exposed to GBV. There is documented evidence that other factors (e.g. substance abuse, alcohol consumption, multiple sex partners, and unprotected sex) play a role in the association of GBV and HIV as well (Lopez et al., 2010; Schafer et al., 2012).

This study contributes to positive social change by providing evidence that routine GBV screening is needed in HIV care of HIV-positive women. GBV may be a

hindrance to HIV care, which can lead to negative health outcomes. Results from this study will provide more evidence of the association of GBV and HIV treatment adherence. Future research can help with providing solutions to help alleviate these issues among HIV-positive women. Interventions such as counseling or support groups can provide HIV-positive women with the necessary help to take an active role in disease management. HIV-positive women may also gain an understanding of how social relationships can affect mental and physical health.

### **Summary**

HIV-infected women have to cope with numerous health and social issues. GBV hinders women from seeking and maintaining health services including prevention and treatment. Treatment adherence is a necessity for people living with HIV/AIDS to prolong life, maintain viral suppression, and reduce HIV transmission (Olem et al., 2014). HIV and GBV have similar mediating risk factors such as substance abuse, posttraumatic stress disorder, depression, suicide ideation, poverty, and lack of education. These conditions along with GBV may also influence treatment adherence. The main purpose of this study was to determine the impact of GBV on treatment adherence among women infected with HIV in the WIHS cohort. Little is known about the effect violence has on the lives of HIV-positive women, especially pertaining to treatment adherence. The type of violence encountered and the length of exposure to violence may also have an effect. Examining treatment adherence among HIV-positive women is important because not adhering to treatment can lead to drug resistance, high viral loads, and increased transmission (Dale et al., 2014). According to Dale (2012), adherence rates for

ethnic minority women infected with HIV ranges between 45% to 64%, this is lower than the national average of 71% (Dale et al., 2012). Treatment adherence is an issue with many barriers that aggravate the problem such as addictions, mental instability, poverty, and health illiteracy. Exploring the issues that surround GBV and treatment adherence can help tailor interventions that will improve the welfare and health conditions of people living with HIV/AIDS.

HIV/AIDS and GBV are multi-faceted public health issues affecting many individuals, especially women. HIV-positive women of African American descent are at a higher risk for violence and worse health outcomes (Schafer et al., 2012). These women not only have to live with violence in relationships, but also with mental illness, substance abuse, low socioeconomic status, and other health disparities as well. Previous researchers have examined these various conditions and issues found within the HIV community, especially among women. Many of these factors may also help to mediate the relationship of GBV and treatment adherence among people infected with HIV/AIDS. Research has shown there are many barriers to treatment adherence among people infected with HIV with little emphasis placed on violence, specifically GBV. In Chapter 2, I discuss previous literature on HIV/AIDS and treatment adherence as well as other factors contributing to the association such as mental illness and substance use.

## Chapter 2: Literature Review

### Introduction

Gender-based violence among women infected with HIV is a public health problem. The definition of GBV includes violence against a woman, from a family member, spouse, partner, friend, or stranger that causes physical, sexual, or psychological harm (Hale & Vazquez, 201; Orza et al., 2015). GBV is the umbrella term for violence against women and includes IPV. One in four women have reported a history of IPV in their lifetime, and 10% have reported IPV in the previous year (McLaughlin, O'Carroll, & O'Connor, 2012). HIV-positive women are vulnerable to violence in their lifetime especially after HIV status disclosure. Outcomes of GBV or IPV for HIV-positive women include progression to AIDS, mental illness, substance use, unprotected sex, and antiretroviral resistance (Aziz & Smith, 2011; El-Bassel et al., 2011a; El-Bassel et al., 2011b; Jewkes et al., 2015; Schafer et al., 2012). Fear of their abuser hinders women's power to control decisions pertaining to their sexual health such as condom negotiation. Condom negotiation is essential in sexual relationships to protect not only the woman's health, but the health of her partner as well. Condom use is essential because it protects women from other sexually transmitted infections (STIs), which can also increase the risk of HIV infection (Crosby et al., 2011). IPV can break down a woman's self-esteem along with her emotional and mental state where decision-making is impaired which leads to poor judgment. Poor decision-making can also be a barrier to seeking HIV care and adhering to treatment.

Women make up 26% of new HIV infections each year (CDC, 2016b). Women who experience GBV are at an increased risk of contracting HIV from their abusive partners. Abused women suffer from mental health issues, drug addiction, poverty, and low self-esteem and are more likely to engage in risky sexual behaviors which increase the likelihood of HIV infection (El-Bassel et al., 2011a). Also, perpetrators of the abuse are more likely to have issues with mental illness, drug use, and numerous sexual partners (El-Bassel et al., 2011a). These factors also place women's health at risk by worsening adverse health outcomes, leading to earlier progression to AIDS (Schafer et al., 2012). Fear of abuse and violence may also hinder women from disclosing their HIV status, and from seeking HIV care and treatment. HAART is an effective method for prolonging the life of HIV-positive individuals and improving their quality of life (Mills et al., 2006). It is important that HIV-positive women adhere to treatment to increase the likelihood of positive health outcomes while protecting their sexual partners and themselves. The purpose of this study was to determine if gender-based violence is a barrier to treatment adherence among HIV-positive women in the WIHS.

Many factors contribute to the relationship between HIV and GBV. Women who experience GBV are at a higher risk for contracting HIV than women who do not experience GBV (Leburu & Phetho-Thekisho, 2015; Mittal et al., 2013). Conditions that contribute to this higher risk are mental illness, multiple sex partners, unprotected sex, substance abuse, and alcohol addiction. Inconsistent condom use or no condom use at all is often common among women in abusive relationships. These women often lack the power and self-esteem for effective condom negotiation skills, which is essential in

relationships involving sexual activity. Male perpetrators may become violent, due to suspicion of mistrust, if women request to use a condom. Therefore, these women are forced to have unprotected sex with their abusive male partners. Women may also be fearful that condom negotiation will require them to disclose their HIV status, which can also cause a violent situation.

Women who are victims of violence are also at risk for mental illness such as PTSD, depression, and suicide ideation. Trauma exposure can lead to mental illness or exacerbate symptoms that are already there. Research has found that 31% to 84.4% of IPV victims are affected by PTSD (Dutton et al., 2006). Women exposed to physical GBV are also more likely to suffer from PTSD. El-Bassel et al. (2011b) conducted a study to determine the association of PTSD with HIV risk among women visiting a New York hospital emergency room and found that 29% of the sample population displayed symptoms of PTSD along with having sex with multiple sexual partners, having sex with an infected partner, having experienced IPV, and having unprotected sex within the previous six months. El-Bassel et al. (2011b) also found that IPV was a mediator within the relationship between PTSD and HIV. Women who experience IPV develop symptoms of PTSD as a coping mechanism or by-product of traumatic exposure (Machtiger et al., 2012). Depression is another mental condition that is commonly found among IPV victims. Sixty percent of abused women who have reported a history of HIV are 2 times more likely to have depression than the general population. (Dutton et al., 2006). Illangasekare et al. (2012) found that women who suffered from depressive symptoms were more likely to report experiences of IPV (Illangasekare, et al., 2012).

Comorbidity of depression and PTSD was highly prevalent among abused women occurring in greater than 50% of Dutton et. al.'s (2006) sample. The magnitude of the abuse was correlated with the magnitude of the symptoms of mental illness. For example, the severity of the abusive experiences was linked to the severity of depressive symptoms or PTSD. Depression and PTSD within HIV-positive women can lead to adverse health outcomes and AIDS (Aziz & Smith, 2011; Dutton et al., 2006). Mental health has an impact on physical health; and battered women, who have PTSD, depression, and HIV, are more vulnerable to poor health outcomes. These mental conditions can affect judgment in terms of seeking HIV care and adhering to HIV medication regimens.

Another mental condition commonly found among women who have experienced violence is suicide ideation. According to McLaughlin, O'Carroll, and O'Connor (2012), 35-40% of women who are victims of IPV have made a suicide attempt at some point during or after the end of an abusive relationship. Suicide ideation is also higher in women with a lifetime prevalence of IPV than in those with a recent history of violence. McLaughlin, O'Carroll, and O'Connor (2012) conducted a systematic review of published articles investigating a relationship between IPV and suicide ideation or suicidal behavior. Of the thirty-seven articles they found, most only focused on the association between physical IPV and suicide ideation, while only three included psychological IPV. McLaughlin et al. (2012) also found that the definitions of suicide ideation and the measures used to assess the variables were varied across the studies. Many of the studies only had one question on the survey to assess the variable among the sample population. The relationship between IPV and suicide ideation mimics that of

IPV with PTSD and depression in that when the magnitude of IPV increases so too does the risk of suicide for the abused woman (McLaughlin et al., 2012). Suicidal behavior is an issue for battered women, and suicide ideation has also been found in IPV victims suffering from PTSD and depression. In a cross-sectional study, Blasco-Ros, Sanchez-Lorente, and Martinez (2010) examined the mental health deterioration of women with a history of physical and psychological abuse and determined that women who were exposed to physical and psychological abuse recovered from symptoms of depression, anxiety, and PTSD than those who were only exposed to psychological abuse; once physical IPV had ended and through perceived emotional support.

Very few researchers have examined the influence of IPV on treatment adherence among HIV-positive women. Trimble, Nava, and McFarlene (2013) examined the relationship of IPV and adherence to antiretroviral therapy among 272 women receiving treatment from an HIV clinic and found that women with recent experiences of IPV had lower adherence than women without experiences of IPV. The prevalence of IPV among the sample population was 52%, which is very similar to other studies investigating lifetime violence among HIV-positive women with an IPV prevalence of 55% (Machtinger et al., 2012; Schwartz et al., 2014; Trimble et al., 2013). Trimble and colleagues (2013) defined violence as physical and sexual threats or acts that occurred within the previous 12 months, excluding the participant's lifetime history of violence or experience of emotional or psychological violence. Including these two factors may have increased IPV prevalence within the sample while providing more information on the relationship between IPV and adherence. Comorbid conditions such as PTSD and

depression can also have an impact on adherence. People with PTSD, depression, or both, who are living with HIV/AIDS, are more likely to have decreased medication adherence to antiretroviral therapy (ART) (Boarts et al., 2006; Mills et al., 2006). It is important to screen for mental illness along with IPV during HIV care so that HIV-positive individuals get treatment for all of their conditions and illnesses. As I noted earlier, untreated mental health conditions can impair decision-making abilities in relation to seeking and receiving care along with disease management.

### **Literature Search Strategy**

#### **Library Databases and Search Engines Used**

I accessed the following databases via Walden University's library: Academic Search Complete, Science Direct, Medline, Cumulative Index to Nursing & Allied Health Literature (CINAHL), PubMed, PsycINFO, PsycARTICLES, Psychology: A Sage Full-Text Collection, and SocINDEX. Google Scholar was the only search engine I used for this literature search.

#### **Key Search Terms**

Key search terms for this literature review included *gender-based violence (GBV)*, *intimate partner violence (IPV)*, *interpersonal violence*, *violence*, *violence against women*, *domestic violence*, *African American women*, *HIV-positive women*, *HIV/AIDS risk*, *HIV/AIDS infection*, *treatment adherence*, *health belief model*, *theory*, *domestic abuse*, and *spousal abuse*. Combination of search terms included *gender-based violence*, *HIV*, and *treatment adherence*; *intimate partner violence and HIV/AIDS risk/infection and women and treatment adherence*; *violence against women and HIV/AIDS and*

*treatment adherence; and domestic violence and HIV/AIDS and treatment adherence and women.* I also included the search term *theory* in the search term combinations to search for any relevant theories used to examine relationships among the key variables GBV, IPV, HIV, and treatment adherence.

### **Scope of the Literature Review**

Most of the literature for this review came from peer-reviewed articles and book chapters. Many of the articles and books I included were published between the years of 2006 and 2015, but some articles on the Health Belief Model were published earlier. Articles from psychology, sociology, nursing, and medicine databases were included if they pertained to HIV/AIDS, IPV, GBV, and treatment adherence. Articles that also included mental illness, substance use, and condom use along with HIV and IPV were also included within the literature review. I excluded articles that did not investigate the relationship of HIV/AIDS and GBV among people living with HIV/AIDS.

### **Theoretical Foundation**

The HBM was developed by social psychologists in the United States Public Health Service in the 1950s to detect and prevent disease by motivating people to adopt positive health behaviors (Glanz, Rimer, & Viswanath, 2008; Simon-Morton, McLeroy, & Wendel, 2012). The HBM was later used by researchers and public health advocates to explain health behavior such as adherence to medications. The main concept of the HBM is that people's perceived attitudes on getting a condition or disease will initiate action to reduce their risks or eliminate the problem altogether. This model helps to explain why people are only ready to act when they perceive themselves to be susceptible

to a condition or disease. If there is no immediate threat to their health, then people are less likely to act. According to Simon-Morton, McLeroy, and Wendel (2012), the key constructs of the HBM are perceived susceptibility, perceived threat, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy.

Perceived susceptibility encompasses an individual's belief regarding the chances of developing a disease or condition (Glanz et al., 2008; Simon-Morton et al., 2012). For example, HIV-positive, GBV-exposed women may believe that being in an abusive relationship impacts their ability to adhere to HIV treatment. Perceived threat includes both perceived susceptibility and perceived severity, both of which are related to an individual's attitude regarding the likelihood that an event can occur. For example, GBV victims may perceive themselves as vulnerable to negative health outcomes due to violence endured and HIV status (Simon-Morton et al., 2012). Perceived severity relates to feelings and thoughts on the likelihood and magnitude of an event. For example, if GBV victims with HIV feel strongly that violence is affecting their health and treatment adherence, then they are more likely to take action to improve their welfare. Perceived benefits are the rewards or positive factors that ensue from adopting behavior change that leads to improvement of conditions. HIV-positive women who are exposed to GBV are more likely to leave an abusive relationship when they see an improvement in their mental and physical health, and a better adherence to treatment. Perceived barriers are hindrances or obstacles that reduce the likelihood of adopting positive health behaviors. For GBV victims, health behaviors such as drug use or low self-esteem can prevent many

from leaving violent relationships. Stigma and fear of violence may also hinder these women from seeking and continuing HIV care.

The HBM has been used to study medical adherence and IPV. A person's perception of health and self-efficacy has an impact on seeking care and disease management. In a cross-sectional study of HIV-positive adults, researchers found that younger adults had poor adherence to HAART than adults 50 years or older (Barclay et al., 2007). Also, individuals, 50 years or older, were 95% adherent to their HIV medications (Barclay et al., 2007). Age was a significant factor for adherence among the sample. The HBM posits that individuals who believe that they are at high risk for a disease or condition are more likely to take action such as preventative measures or adhering to treatment to improve health. People living with HIV/AIDS who do not believe that HAART is effective in prolonging their life are more likely to be non-compliant with medication (Barclay et al., 2007; Reynolds et al., 2004). Barclay and colleagues (2007) found individuals with more positive health beliefs and self-efficacy were adherent to HAART. In another cross-sectional study, Reynolds and colleagues (2004) also investigated the effect of health beliefs and psychotic characteristics on medication adherence in the AIDS Clinical Trial Group (ACTG 384) cohort and found that those with positive health beliefs about HIV treatment had higher adherence than those with a negative perception about HIV treatment. Fifty-six percent of the sample population were sure of their ability to take HIV medications as prescribed, which was defined as adherence self-efficacy, while those with depression, stress, or distress had less positive beliefs, for example, questioning the effectiveness of HIV treatment in

managing the disease or the likelihood of developing AIDS (Reynolds et al., 2004). Self-efficacy is a positive predictor of medication adherence (Barclay et al., 2007; Reynolds et al., 2004). When people living with HIV/AIDS believe in their capabilities to manage their disease effectively, they are more likely to comply with HAART. The internal motivation seems to help people initiate positive health behaviors for better health and safety. Disease severity also increases medication adherence. People living with HIV/AIDS who have the perception that their disease will worsen without HAART are more likely to take their medications as prescribed (DiMatteo et al., 2007; Gao et al., 2000). Understanding HIV and antiretroviral therapy enhances HIV-positive individuals' chances of managing their disease effectively as well as seeking HIV care when necessary. The HBM has many components that seem to work together as motivation for lifestyle change.

The HBM provides insight as to how a person's attitudes and beliefs on health and wellness dictate their actions to adopt positive health behaviors and prevent adverse health outcomes. For this longitudinal study, women's perceptions of GBV and HIV can play a role in their decision making when dealing with these two situations. For example, if women do not perceive a threat to their health in an abusive relationship, then they have an increased likelihood of staying in the violent relationship. Abusive relationships can increase a woman's risk of HIV due to unprotected sex, contracting other sexually transmitted infections, PTSD, and depressive symptoms (El-Bassel et al., 2011a; El-Bassel et al., 2011b). HIV treatment is necessary to help improve HIV-positive individuals' health. Also, self-efficacy is an internal motivator, which provides these

individuals with the empowerment to take action in their disease management and relationships. Healthy relationships and social support provide mental and emotional stability that can also enhance HIV-positive individuals' dispositions, positive health behaviors, and social conditions. Plus, health beliefs can change over the course of a research study such as the WIHS. This longitudinal study includes many follow-up visits with interviews and physical examinations that allowed for participants to interact with researchers along with receive pertinent health information, which can contribute to better health behaviors (WDMAC, 2013). The HBM explains behavior change as a process that happens in a series of steps as well as a transformation in mental thinking and capabilities that leads to treatment adherence and healthy relationships.

The research questions focus on the impact that the type and length of exposure of GBV has on treatment adherence among women infected with HIV. Ways in which GBV can impact treatment adherence is not only physical, but psychological as well. Physical aspects of GBV include bruises, scars, higher viral loads, and progression to AIDS (Aziz & Smith, 2011; Schafer et al., 2011). Psychological aspects of IPV include mental instability, substance use, low self-esteem, self-pity, and suicidal thoughts and behaviors (Blanco-Ros et al., 2010; El-Bassel et al., 2011a, El-Bassel et al., 2011b, McLaughlin et al., 2012; Schwartz et al., 2014). These physical and psychological factors, which contribute to the relationship between HIV and GBV, can contribute to a change in health beliefs and actions among the target population. The susceptibility and severity of violence and mental instability enhances adverse health outcomes while benefits and cues to action improves self-efficacy and behavior change to manage HIV

and seek resources that will help eliminate unhealthy relationships. The application of the HBM will demonstrate the physical and psychological impact of GBV on HIV treatment adherence among women infected with HIV.

### **Literature Review of Key Variables and/or Concepts**

#### **GBV/ IPV & HIV Risk/Infection among Women**

GBV and HIV are two intersecting public health epidemics found among HIV-positive women, regardless of race. One in three women has experienced IPV, and one in four people infected with HIV are women (Black et al., 2011; Centers for Disease Control and Prevention, 2016b). In 2010, African American women made up 29% of HIV new cases (CDC, 2016a). GBV increases a woman's risk of contracting HIV. Women who are victims of GBV are vulnerable to HIV infection due to engaging in risky behaviors such as drug use, alcohol abuse, multiple sex partners, inconsistent condom use, and unprotected sex. In a study of 14,000 women, Sareen, Pagura, and Grant (2009) discovered that IPV played a role in 12% of new HIV infections. Plus, women who have experienced IPV were also at a greater risk of having other sexually transmitted infections (STIs), which can increase the risk of HIV infection (Ramachandran, Yonas, Silvestrem & Burke, 2010). Because violence increases a woman's risk of being infected with HIV, then it can also have an impact on a woman's health outcomes after HIV infection has occurred.

HIV-positive women who are also victims of GBV postponed seeking HIV care, failed to attend appointments with physicians, and have worse health outcomes than HIV-positive women who are not victims of GBV (Aziz & Smith, 2011; Illangaskare et al.,

2011). Denial and fear of HIV disclosure are reasons for postponement of HIV care, while failure to attend doctors' appointments can be attributed to hindrances and barriers from an abusive partner along with stigma. HIV-positive women suffering from IPV have worse health outcomes due to stress, mental instability, lack of support, and lack of HIV care (Schafer et al., 2012). Mental health and physical health are linked with one having an influence on the other. To better understand the association between GBV and treatment adherence among HIV-positive women, it is important to investigate and understand the underlying factors involved in the relationship between GBV and HIV.

Inconsistent condom use is an issue among women who experience GBV because many of these women lack the condom negotiation skills to refuse unprotected sex with an abusive partner. Allen, Simon, Edwards, and Simeon (2010) determined that 54% of women infected with HIV/AIDS within the Caribbean Regional Network of People Living with HIV/AIDS were more likely to use condoms if they had a HIV-negative partner, disclosed HIV status to partners, and used a condom during the first sexual encounter with their partners. Factors influencing condom use among the sample was alcohol use and economic security. Furthermore, women in the sample population were non-adherent to antiretroviral therapy. Another study investigating consistent condom use of African American women, living in the US at high risk for HIV and other sexually transmitted infections, discovered that 32% of the participants were consistent condom users (Crosby et al., 2011). Partner negotiation was a positive predictor of condom use, while fear of violence was a strong predictor in inconsistent condom use or no condom use altogether. Lack of power in an abusive relationship accompanied by fear of violence

puts many women's health at risk by increasing their risk of HIV, worsening HIV infection, and exacerbating mental illness, substance use, and alcohol use.

Drug use is very prevalent with victims of GBV. Many victims use drugs as a coping mechanism to handle the psychological trauma and stress that comes with abuse. Drugs can impair judgment, which can increase the risk of HIV transmission. Unprotected sex, transactional sex with multiple partners, and not using clean needles are some of the ways that drug use increases HIV risk and infection. In a qualitative study, researchers found that more than 60% of women in the sample population had mental health symptoms stemming from childhood abuse; and these women used illegal substances such as cocaine, crack, or heroin to cope with the pain of traumatic experiences (Clum et al., 2009). GBV victims who suffer from other afflictions such as mental illness may abuse prescription drugs to handle difficult situations. Many HIV interventions have been unsuccessful; these programs focus on HIV behaviors and issues neglecting the other factors that contribute to HIV risk among the target population such as substance use, mental illness, low self-esteem, and lack of social support. Additionally, abusive partners can increase a woman's risk of HIV transmission. Men who use drugs are more likely to engage in unprotected sex, have multiple partners, been incarcerated, and have a history of childhood abuse themselves (El-Bassel et al., 2011b). Very few studies have investigated the impact of GBV and HIV on men, but HIV transmission is an issue that affects both men and women. Substance use hinders a person's decision-making ability and can influence attitudes and perceptions of abuse and unhealthy relationships (El-Bassel et al., 2011a; Schwartz et al., 2014). For example, a woman that

abuses drugs may not think that her relationship is abusive or understand the psychological and physical consequences of staying in a violent relationship. Codependency can be another product of drug use and GBV in a relationship. Women can develop codependency for their male partners because their male partners provide these women with emotional and financial support as well as drugs. The men hold all the power in the relationship, which makes it even harder for these women to leave and seek outside help.

Substance use also plays a role in treatment adherence among HIV positive women. Malow and others (2013) conducted a cross-sectional study to investigate barriers of treatment adherence among Haitians living with HIV and learned, through face to face interviews, that drug use and depression were barriers to treatment adherence among the sample population (Malow, et al., 2013). Alcohol use was another barrier. Alcohol and substance use were used as coping agents to help the HIV-positive participants manage their HIV status and abuse. Many of the participants, who were impoverished with little to no education, were more likely to be skeptical of the antiretroviral therapy's effectiveness and were less likely to adhere to treatment. Suspicion of the healthcare system along with skepticism about the effectiveness of HIV medication hinders many people from seeking medical services and leads to worse health outcomes. On the contrary, in an observational study examining medication adherence in couples seeking HIV care at a clinic in Miami, Florida, researchers found that couples had higher adherence to medication when at least one partner was compliant with medication (Lopez et al., 2010).

## **Mental Illness and IPV**

Mental illnesses are often a result of GBV and commonly found among individuals infected with HIV. Women who have been exposed to GBV or IPV are more likely to suffer from PTSD, depression, and suicide ideation (Aziz & Smith, 2011; Baird et al., 2012; Jina & Thomas, 2013; Malow et al., 2013; McLaughlin et al., 2012). These conditions are likely outcomes to coping mechanisms abused women use to handle GBV in their relationships. These conditions also exacerbate HIV progression. El-Bassel et al. (2011b) examined the relationship of PTSD and HIV risk behaviors among 241 poverty-stricken women seeking healthcare services from an urban hospital (El-Bassel, Gilbert, Vinocur, Chang, & Wu, 2011b). Thirty percent of women with a history of childhood abuse had symptoms of PTSD, engaged in unprotected sex, traded sex for money, and had numerous sex partners, while three percent of the sample population was infected with HIV (El-Bassel et al., 2011b). The researchers did not investigate whether the women knew of their HIV status prior to participating in the research study. Women with severe symptoms of PTSD were socially isolated and displayed avoidant behavior, which hindered seeking care and social support. These factors increased women's risk of negative health outcomes, specifically HIV-positive women who were vulnerable due to their disease.

Baird, Jones, Martin, and Yearwood (2012) conducted a systematic review examining the welfare and mental health of HIV-positive Caribbean women and girls. The researchers hypothesized that physical and mental health are linked, thus, declining physical health can lead to a decline in mental health and vice versa. Mental conditions

most commonly found among the HIV-positive participants were mood disorders, mania, anxiety, PTSD, depression, dysthymia, and panic (Baird et al., 2012; Malow et al., 2013). Women who were vulnerable to these mental conditions were susceptible to risky sexual behaviors that placed their health at higher risk including a rapid progression to AIDS. Mental illness also influenced treatment adherence among the sample. HIV-positive women's judgment is impaired due to mental health conditions. Women infected with HIV and mental health issues are at risk of poor health outcomes because mental health conditions are not screened during HIV healthcare delivery.

Depression in conjunction with drug use can also increase poor health outcomes among HIV-positive individuals. Comorbidity of mental health conditions and substance use increases health behaviors that are detrimental to the improvement of health such as treatment non-adherence. These conditions can be maladaptive coping skills to deal with HIV status (Malow et al., 2013). Coping with HIV and violence can cause a mental overload, which can lead to physical manifestations of symptoms. HIV treatment must include care for not only HIV, but other diseases and conditions as well. Sound mental health improves the likelihood that HIV-positive women will do what is necessary to ensure their health and welfare are a priority.

Abused women can display suicidal behavior. In a global cross-sectional study by the World Health Organization (WHO), researchers determined that when IPV was coupled with child sexual abuse, depression, and poverty, the number of suicide attempts increased (Devries et al. 2011). This study included women from low income, developing countries from around the world and found that suicide attempts were higher among

abused women in South American countries and lowest in African countries. Cultural differences and social norms could play a role in how residents of these countries view violence from male partners as well as cultural norms of suicide. Countries with a strong religious culture may view suicide negatively, which decreases the likelihood of women choosing this option to alleviate shame and pain of GBV. Childhood sexual abuse was the cause of 11% of suicide attempts among women (Devries et al., 2011). Dealing with childhood trauma without any counseling in addition to mental issues, poverty, and recent experiences of GBV can be mentally detrimental to women and increase suicidal behaviors. This study was limited to lifetime prevalence of GBV and childhood abuse. The researchers did not distinguish between sexual, physical, and emotional GBV, which could have provided insight as to which type of violence had the greatest impact on suicide attempts and suicidal behaviors.

McLaughlin, O'Carroll, and O'Connor (2012) performed a systematic review of journal articles and ascertained that depression and PTSD mediated the association between suicide ideation and IPV, specifically sexual and physical IPV. As IPV became more severe, the risk of suicide increased. The researchers determined that the definitions of terms differed among the articles such as some articles used keywords like suicide ideation, suicide attempts, or suicidality to mean an attempt to take one's own life (McLaughlin et al., 2012). Some articles defined IPV as recent exposure of one year or less or lifetime exposure into childhood. These differences in terms and measures could have played a role in the outcomes and associations among variables.

## **HIV Treatment Adherence and GBV/IPV**

Few studies directly investigated the association of HIV and GBV or IPV or the relationship between GBV and treatment adherence among HIV-positive individuals, specifically among women. Sareen, Pagura, and Grant (2009) investigated the number of cases of HIV that are connected to IPV in a large representative sample of women. Among the sample, 12% of the HIV infection cases were women who experienced IPV. Participants in violent relationships are at a higher risk for contracting HIV. Inconsistent condom use and multiple sex partners also influenced the study outcome. This study used a large, representative sample of 13,928 women and examined the association of IPV to HIV infection in women. IPV was found to be associated with HIV transmission. Also, this study only investigated recent IPV in the past year instead of a lifetime prevalence of IPV within the sample. Trimble, Nava, and McFarlene (2013) also conducted a study examining the effects recent exposure of IPV had on treatment adherence among a convenience sample of abused HIV-positive women and non-abused HIV-positive women receiving care at a HIV urban clinic; the prevalence of IPV within the sample was 55.3%, which is comparable to other studies where the prevalence of IPV is two times greater than the US national average (Trimble et al., 2013). Women who experienced multiple events of IPV had lower adherence to antiretroviral therapy than women who reported one event or none at all. Plus, women who experienced IPV had higher viral loads than those who had not experienced IPV. IPV was a stressor that leads to poor adherence, which can lead to drug resistance or antiretroviral therapy failure, disease progression, and mortality (Trimble et al., 2013). Like other studies on IPV and HIV, this study did not investigate lifetime exposure to IPV, differentiate between the types of IPV, or examine comorbid conditions such as PTSD or drug use, which are commonly linked to IPV and HIV.

## Summary and Conclusions

Gender-based violence and HIV are associated with common mediators intertwined. HIV-positive women are at a greater risk for violence, which increases their risk for adverse health outcomes. PTSD, depression, and suicide ideation are prevalent among HIV-positive women who are abused (Blasco-Ros et al., 2010; Devries et al., 2011; El-Bassel et al., 2011b). The length of exposure and type of GBV experienced can influence the exacerbation of mental illness. Substance abuse is also very prevalent among abused victims. (El-Bassel et al., 2011a). Substance use and mental illness can be maladaptive coping behaviors that abused HIV-positive women use to manage and handle violent relationships as well as maintain some type of control in powerless situations. GBV has an impact on treatment adherence among HIV-positive women. Women who experience IPV have higher viral loads and lower HIV medication adherence than women who do not experience IPV (Trimble et al., 2013). Treatment adherence is necessary to prolong the life of HIV-positive individuals and decrease viral loads. GBV along with other stressors can lead to comorbidity, which worsen the health of HIV-positive women through drug resistance, rapid disease progression, and death.

Studies focusing on GBV and HIV have many limitations including self-reported data, different definitions and measures for GBV or IPV and other variables, cross-sectional designs, convenience sampling, and low sample sizes (Blasco-Ros et al., 2010; El-Bassel et al., 2011b; Illangasekare et al., 2011; Malow et al., 2013). Self-reported data can cause bias due to under and over-reporting as well as recall bias in reported childhood and lifetime exposure of abuse. For more accurate data, medical records,

physical examinations, and lab tests should be utilized along with self-reported data. More than one data collection method should be used to enhance the accuracy of the data. Medical records can also provide more information of mental illness symptoms, suicide attempts, and drug use. Many studies used different definitions and measures to describe the variables. For example, McLaughlin, O'Carroll, and O'Connor (2012) used the term intimate partner abuse (IPA) to describe physical, sexual, and emotional violence between two people in an intimate relationship while other studies used the term intimate partner violence (IPV). Other studies used the term gender-based violence to describe violence perpetrated by a partner, spouse, family member, or stranger (Dunkle et al., 2012; Leburu et al., 2015; Orza et al., 2015; Schwartz et al., 2014). Some studies described suicide as suicide ideation, suicide attempts, suicidal behaviors, or suicidality (Blasco-Ros et al., 2010; Devries et al, 2011; McLaughlin et al., 2012). Length of exposure was measured differently among studies on GBV, IPV, HIV, and treatment adherence. Some studies measured exposure to IPV as within the previous year, during childhood, or over the course of a lifetime. Some studies defined exposure to IPV as violence experienced during the past year (Illagansekare et al., 2011; Sareen et al., 2009; Trimble et al., 2013). Other studies measured IPV in terms of childhood abuse or lifetime prevalence of IPV (El-Bassel et al., 2011b).

Research designs have an impact on outcomes of a research study. Cross-sectional designs hinder causality together with the temporal relationship of which came first GBV, IPV, HIV, or other variables of interest. This research design does help to establish a trend or pattern of factors that contribute to IPV and HIV (Illagansekare et al.,

2011; Sareen et al., 2009; Trimble et al., 2013). Convenience sampling is used because it is easier to recruit HIV- positive women from places where HIV care is given such as clinics, hospitals, and emergency departments (Baird et al., 2012; Crosby et al., 2011; El-Bassel et al., 2011a; El-Bassel et al., 2011b; Illangasekare et al., 2012). It is difficult to use randomized sampling when the research questions focus on retrospective experiences of IPV and HIV infection. Additionally, due to the sensitivity of GBV and HIV, many studies had low sample sizes, which could affect the power of the results.

It is known that there is a strong association between GBV and HIV. Plus, mental illness, drug use, alcohol use, and suicide ideation are mediators between GBV and HIV. The direct relationship between IPV and HIV treatment adherence is seldom examined (Lopez et al., 2010; Schafer et al., 2012; Trimble et al., 2013). IPV is rarely directly associated with HIV or treatment adherence, but it is often found to be a mediator or contributing factor. Few studies distinguished between physical, sexual, or psychological GBV in association with HIV risk/infection or treatment adherence. Each of these types of GBV has different impacts on the physical and mental health of the victim. How abused women report and handle each type of IPV may be different as well. For example, women who experience sexual and physical IPV are more likely to attempt suicide (McLaughlin et al., 2012).

This research study will directly examine the relationship of GBV on treatment adherence in HIV-positive women from a large representative cohort. The influence of the type of GBV experienced and length of exposure will also be determined. The WIHS cohort has 3,772 participants of HIV-positive and HIV-negative women (WDMAC,

2013). Participants in the WIHS answer a series of questionnaires and have physical examinations. This cohort will provide enough participants to establish power in data analysis to improve the accuracy of the research findings. The study will also examine treatment adherence over time since the WIHS is a longitudinal study with several follow-up visits. Another advantage to this study is the use of a comparison group of non-abused HIV-positive women, which will help to control for HIV infection and other demographic variables. The research methodology and data analysis procedures are presented in Chapter 3.

## Chapter 3: Research Method

### **Introduction**

The purpose of this quantitative, case-control study was to utilize the HBM to examine any association of GBV and treatment adherence among HIV-positive women who had experienced GBV and those who had not, controlling for age, education, marital status, and socioeconomic status. Participants were recruited from the WIHS. In this study, the independent variable, GBV, was defined as physical, psychological, and sexual violence. The dependent variable, treatment adherence, was defined as taking medication as prescribed, and the control variables included age, education, socioeconomic status, mental illness, marital status, and substance abuse.

I considered as cases the participants who had a history of exposure to GBV; and participants that had never been exposed to GBV were considered the controls. Because I could not use random selection, the two groups were nonequivalent, which could have introduced selection bias. Matching the participants on other demographic characteristics helped alleviate this bias. Because the two groups were not equivalent, I will use the term “comparison group” instead of “control group” for the remainder of this study (Mitchell & Jolley, 2010). I determined that the secondary dataset from the WIHS was the most feasible to use in this study because it involved data about the target population, --HIV-positive women including their history of abuse or GBV as well as other behaviors pertinent to this study (Bacon et. al., 2005). I identified and addressed threats to internal and external validity to reduce the likelihood of inaccurate results and interpretations. The WIHS has been collecting data on HIV-positive and HIV-negative women for the

past 18 years, and it is the only known longitudinal study investigating the effects of HIV disease on American women (Barkan et al., 1998). Since the WIHS is a longitudinal study, threats of internal and external validity include maturation, history, sampling bias, and the Hawthorne effect (Koshar & Kindy, 2006). Confidentiality and participants' privacy were maintained throughout the study.

### **Research Design and Rationale**

The independent variable was GBV, which I defined as physical, psychological, or sexual violence between a victim and a perpetrator. The dependent variable was treatment adherence, which I defined as taking HIV medication as prescribed. Mediating or moderating variables were substance use, socioeconomic status, age, and mental illness.

The research design I used was a longitudinal study with a treatment and comparison group, which were nonequivalent. I divided participants from the WIHS dataset into two groups: HIV-positive women exposed to GBV, and HIV-positive women not exposed to GBV. Using the criterion, exposure to GBV, to differentiate between the two groups of women provided me a more accurate analysis as to whether GBV (physical, psychological, or sexual) affected treatment adherence among the sample population. I only analyzed lifetime violence and recent exposure to GBV for the participants exposed to GBV. Separating the two groups within the dataset ensured better interpretation of the outcomes during data analysis.

Time and resource constraints consistent with the nonequivalent control group in longitudinal design required that I match the participants on certain key variables because

random assignment was not reasonable for this study. Matching consists of ensuring that the participants in both the treatment and comparison groups are as similar as possible according to specific characteristics or variables such as gender and age (Mitchell & Jolley, 2010). Matching can be time consuming, especially when dealing with a large sample size. For this study, there was no time constraint in terms of data collection because I used secondary data. However, finding enough people within the target population for the comparison and treatment group that had enough matching characteristics to increase external validity was difficult. In short, there were more participants in the sample population that qualified for the treatment group rather than the comparison (control) group. Having an equal number of participants for each of the two groups was thus not feasible.

My choice of research design was consistent with the research design that I determined was needed to advance knowledge in HIV/AIDS treatment adherence. Most researchers have a single group with no random assignment and have used cross-sectional surveys (Illangansekare et al., 2011; Rose et al., 2010; Sareen et al., 2009). These studies had low external and internal validity due to lack of random assignment, small sample sizes, and lack of a comparison group. In addition, cross-sectional designs only provided information at a certain period of time whereas longitudinal designs can show trends and patterns among variables over time while taking into consideration a myriad of conditions. Small sample sizes lack generalizability and statistical power to illustrate a true association between variables if one exists (Mitchell & Jolley, 2010). Random

assignment has rarely been used in HIV/AIDS studies because it is difficult to randomly assign participants to groups based on HIV status.

## **Methodology**

### **Population**

The target population was 1,411 women who were infected with HIV/AIDS in the WIHS cohort. The target population consisted of participants from the original 1994-1995 and the 2001-2002 expanded cohorts (Bacon et al., 2005). The WIHS cohort was expanded in 2001 to replace the deceased participants in the original cohort, and to continue the research while new HIV treatments were being created. Demographic characteristics of the target population included an age range of 19-89 years with various education levels, incomes, marital statuses, and sexual orientations (Barkan et al., 1998). According to Barkan (1998), the methods of HIV exposure among the WIHS participants were intravenous drug use (34%), heterosexual sex (42%), blood transfusion risk (4%), and other or no identified risk (20%). Participants were prescribed HAART, but HAART use was not a requirement for participation in the WIHS study. Many participants had a history of sexual and physical abuse, and some did not have health insurance. Single motherhood and poverty were other social conditions found within the target population.

### **Sampling Strategy/Method:**

For this study, I used purposive sampling. Purposive sampling is a form of nonprobability sampling where participants are recruited with a specific purpose in mind (Trochim, 2006). For example, in my study participants infected with HIV with a history of GBV were needed to determine a relationship between GBV and HIV treatment

adherence. Purposive sampling within the WIHS cohort allowed for rapid identification of female participants that meet the inclusion criteria. Random or probability sampling was not feasible because I would have needed to assign participants to the treatment and comparison groups based on retrospective experiences with GBV and treatment adherence. It would, of course, have been unethical to randomly assign participants to groups and expose them to GBV or withhold treatment to determine the effects of GBV on treatment adherence. The WIHS cohort is a large sample of HIV-positive and negative women. It was essential that I use purposive sampling to answer the research questions appropriately.

I drew the target sample from the dataset of the WIHS cohort by taking participants that meet the inclusion criteria. I assigned participants with a history of GBV to the treatment group, and those without a history of GBV were assigned to the comparison group. The inclusion criteria were that participants had to be HIV-positive women between 19 and 89 years of age with a history of GBV (treatment group), or no history of GBV (comparison group) who were prescribed HAART medications. Participants had various income and education levels. Exclusion criteria included HIV-negative status, no prescription for HAART medications, or having never taken any HIV medications since HIV-positive diagnosis.

I determined sample size using the G\*Power software tool, which is often used by researchers to determine effect, power level, or sample size depending on previously known information (Faul, Erdfelder, & Buchner, 2009). Effect size is defined as the measurement of variation between groups (Cohen, 1992). I chose a moderate level of

0.50 for the effect size because a 0.50 effect size provides a ten percent variation of whether an association exists between the independent and dependent variables, in this case, GBV and treatment adherence, respectively (Nandy, 2012). I chose a power level of 80% because it is generally used in research studies (Cohen (1992). A smaller power level could have increased the likelihood of a Type II error, and a larger power level would have required a higher sample size, which could have exceeded my resources. With a 0.50 effect size, 80% power level, and alpha level of .05, the total sample size for my study needed to be 372 participants using G\*Power. At minimum, there should be 186 participants in the treatment group and 186 participants in the comparison group.

Archival data from the WIHS provided data on female HIV-positive participants. Methods of recruitment in the WIHS entailed face-to-face interviews. Protection of human subjects and informed consent was highly maintained throughout the WIHS study. Written informed consent was provided in two languages, English and Spanish for both the eligibility screening and enrollment. For participants that were illiterate, an interviewer read the consent form to them and documented this on the form before obtaining signatures. Informed consent forms included information on study procedures focusing on how specimens were stored for future research (Bacon et al., 2005). The institutional review boards reviewed consent forms at each study site. Identification numbers were used throughout the study for participants to maintain confidentiality during the WIHS. Names can only be found on consent and locator forms as well as medical records requests (Bacon et al., 2005).

Recruited between October 1994 and November 1995, the original cohort consisted of 2,059 women infected with HIV and 569 women who were not infected with HIV (Bacon et al., 2005). By 2001, 554 participants of the original cohort had died and the rest of the cohort was older with a median age of 42 years. The WIHS reopened recruitment between October 2001 and September 2002 to recruit younger participants (Bacon et al., 2005). The expanded cohort consisted of an additional 1,144 women bringing the total of the WIHS cohort to 2,762 women with a median age of 32 years. To date there are 3,090 HIV-positive women and 1,047 HIV-negative women enrolled in the WIHS (WDMAC, 2014). These women were recruited from various places that provide HIV services to women such as HIV primary clinics, women's support groups, HIV testing sites, hospital-based programs, drug rehabilitation programs, research programs, and referrals from previously enrolled participants (Barkan et al., 1998). Eligibility criteria for the original cohort included: aged 13 years or older, provided informed consent, had an HIV test, completed an interview in English or Spanish, travelled to and from the clinic site for participation in baseline visit, and provided blood for laboratory testing (Barkan et al., 1998). Eligibility criteria for the expanded cohort comprised the following: documentation of HIV-positive results, HIV-negative results attained no more than 30 days before enrollment for women who are HIV-negative, no history of clinical AIDS-related conditions which can be verified by medical records, laboratory reports of HIV RNA levels and CD4 counts during HAART initiation, and consent to have laboratory specimens stored in the national WIHS repository (Bacon et al., 2005).

Data collection methods were comprised of interviews, physical examinations, and laboratory testing every six months. Interviews were scripted to collect self-reported data on medical history, antiretroviral therapy, obstetric and gynecologic history, sexual behaviors, health care utilization, use of drugs, alcohol, and cigarettes, and attitudes regarding HIV and treatments, and psychological status (Bacon et al., 2005). The WIHS study team conducted standardized training for all WIHS study sites to ensure that the data was of high quality. Medical records were used to provide verification of AIDS-related diagnoses in specific cases. WIHS investigators conducted tests to assess participants' vital signs including blood pressure, weight, height, waist and hip circumference (Bacon et. al., 2005). Skin and oral examinations, breast examinations, abdomen and lymph nodes examinations, and Pap smear examinations were also conducted to gather further insight into participants' health (Bacon et al., 2005). Colposcopy examination and biopsy were performed when necessary according to the WIHS protocol. Laboratory testing consisted of blood, urine, cervicovaginal swab, and lavage fluid specimens taken for baseline testing, and follow-up lab work was done with each six-month visit. Additional samples collected at each visit were stored in the WIHS repositories for future research. Data was managed and stored at the WIHS Data Management & Analysis Center (WDMAC) located at John Hopkins University Bloomberg School of Public Health.

The procedure for gaining access to the data set included accessing the WIHS website. The WIHS provided a free public dataset, but this dataset did not contain pertinent information relevant to this study such as sexual and physical abuse. I submitted

a concept sheet to the WIHS Executive Committee for approval to gain access to the dataset so that I could acquire access to abuse information. After approval, the WDMAC put together a dataset in a password-protected Excel spreadsheet with the necessary information. The Excel spreadsheet covered data from April 1, 1999 through September 30, 2014. In addition, the data file contained a codebook and copies of all questionnaires used during the WIHS study.

### **Instrumentation and Operationalization of Constructs**

The WIHS used several questionnaires to gather data from participants. WIHS investigators at Johns Hopkins Bloomberg School of Public Health developed the data collection instruments. These investigators are experts in a number of fields including pharmacology, gynecology, neurocognition, psychology, and HIV/AIDS. In this study, I used variables obtained from the following WIHS questionnaires: Socio-demographics (Baseline), Medication History, Follow-Up History, Psychosocial Measures, History of Abuse, and Alcohol, Drug Use, and Sexual Behaviors. I obtained permission to use the instruments from the WDMAC by submitting a concept sheet via email.

WIHS questionnaires are reviewed twice a year to ensure the most accurate and highest quality data are revised as needed. Reliability and validity were tested through pilot testing in smaller populations before being utilized throughout the entire study. The Psychosocial Measures questionnaire is a mixture of the Medical Outcomes Study HIV Health Survey (MOS-HIV), Centers for Epidemiology Studies-Depression Scale (CES-D), and abuse and violence questions (Anastos et al., 2006). Reliability of the MOS-HIV has a reliability of 0.70 in-group comparisons and can often exceed 0.75 (JHBSPH, n.d.).

Internal consistency of mental health scores ranges from 0.91 to 0.94 using the MOS-HIV. The CES-D is known for having high reliability and validity in consistency of depressive symptoms among people living with HIV/AIDS especially women (Rubin et al., 2011). GBV questions had an internal consistency of 0.75 (Pyra et al., 2014).

WIHS data collections instruments have been used on HIV-positive populations of women at various WIHS sites around the country and on other populations. The MOS-HIV survey has been used in numerous populations such as in Uganda and Taiwan to assess quality of life along with physical and mental health status among people living with HIV. These studies found reliability scores 0.79 to 0.95 (Stangl et al., 2012; Hsiung et al., 2011). The CES-D questionnaire assesses depressive symptoms among HIV populations such as African American, Hispanic, and Caucasian women with internal consistencies as high as 0.91 (Schwartz et al., 2014). CES-D has also been used on HIV-positive patients in British Columbia, Canada where researchers found the survey had a reliability and validity score of 0.88 and 0.82 respectively in measuring depressive symptoms (Zhang et al., 2012). Pyra (2014) conducted a study investigating the relationship between sexual minority status and violence using questions on abuse and violence from the WIHS study using participants from New York City, Washington, D.C., Chicago, and San Francisco, CA. Internal consistency for these questions was high at 0.75 (Pyra et al., 2014). MOS-HIV, CES-D, and questions on abuse and violence from the WIHS have been validated throughout the field when examining various conditions among people living with HIV/AIDS.

## **Operationalization**

I measured GBV based on type of violence such as physical, sexual, and psychological and time of exposure as in history of violence as well as current experiences of violence such as within the previous 12 months. Abuse questions were taken from the WIHS questionnaire, History of Abuse. History of physical GBV was assessed with the questions, “Have you ever experienced serious physical violence (physical harm by another person)?” and “By that I mean were you ever hurt by a person using an object or were you ever slapped, hit, punched, or kicked? Responses include yes, no, don’t know, or declined. History of sexual GBV was assessed as “At any time in your life, has anyone ever pressured or forced you to have sexual contact? By sexual contact I mean them touching your sexual parts, you touching their sexual parts, or sexual intercourse.” History of psychological or emotional violence was assessed with a yes to the following question “Has a current or previous partner ever threatened to hurt you or kill you; prevented you from leaving or entering your house; prevented you from seeing friends or making phone calls; and prevented you from getting or keeping a job or continuing your education?” Current GBV was assessed with the psychosocial measures questionnaire with the question, “Since your last study visit, has anyone pressured or forced you to have sexual contact? By sexual contact I mean them touching your sexual parts, you touching their sexual parts, or sexual intercourse.” Current physical violence was assessed as “Since your last study visit, have you experienced serious physical (physical harm by another person)? By that I mean were you ever hurt by a person using an object or were you ever slapped, hit, punched, or kicked? Current psychological or

emotional violence was assessed as “Since your last visit, has a current or previous partner: threatened to hurt you or kill you; prevented you from leaving or entering your house; prevented you from seeing friends or making phone calls; and prevented you from getting or keeping a job or continuing your education?” The History of Abuse WIHS questionnaire assessed participants’ history of violence. The psychosocial measures questionnaire assessed current violence between study visits, which are six months apart.

The Medication History questionnaire was used to determine treatment adherence in the WIHS. Treatment adherence was measured with the questions “In the last 30 days, on how many days did you miss at least one dose of any of your HIV medicines?” with the participant being able to write in the number of days; “In the last 30 days, how good a job did you do at taking your HIV medicines in the way you were supposed to? With the responses on a scale ranging from very poor to excellent; and, “In the last 30 days, how often did you take your HIV medicines in the way you were supposed to?” Responses for this question ranged from never to always. The question “What is the main reason for not taking any antiretroviral medications or treatments?” evaluated reasons why participants did not adhere to treatment as prescribed.

Covariates included education (no schooling, grades 1 to 6, grades 7 to 11, completed high school, some college, completed 4 yrs. college, attended/completed graduate school); marital status (single, married, divorced, etc.); employment (yes/no); race /ethnicity (African American, Latina, Other); HIV status, age is self-reported age at time of study, annual household income (\$18,000 or less, more than \$18,000); substance use (crack/cocaine, heroin, marijuana, and heavy drinking); and depression or PTSD

(yes/no). Questions for covariates were found in the WIHS Baseline and Socio-demographics questionnaires.

### **Data Analysis Plan**

I used SPSS version 21 (IBM) for data analysis. Data cleaning and screening procedures consisted of multiple imputation, splitting the dataset by only selecting the HIV-positive participants into a new dataset, and sorting the new dataset into two groups: those who had experienced GBV and those who had not. Since the WIHS dataset contained missing data, I used multiple imputation in data analysis for missing information. According to Rubin (1987) multiple imputation replaces missing data with one or two credible values. Nonresponse is common in survey research and large datasets. When dealing with sensitive topics like abuse and drug use together with censored data, it was important I included all participants in the dataset to accurately investigate GBV, adherence, and other mediating factors. Participants with missing data were included in the data analysis to demonstrate any differences between those who continued participating in the study and those who did not.

Survival analysis, specifically Cox Proportional Hazards model, was the statistical test I used to examine if there is an association between GBV and treatment adherence. Survival analysis techniques are used when the outcome variable is time until an event occurs (Klienbaum and Klein, 2012). In this study, the time variable was the time during follow-up until the event occurred, which is adherence. I chose survival analysis because the secondary dataset from the WIHS contains censored data. Censored data is data where the time to event variable is missing for some participants (Prinja, Gupta, &

Verma, 2010). In longitudinal studies, data is not the same for all participants because of death, lost to follow-up, drop out, etc. Survival analysis was the most effective statistical technique for this type of data. For the Cox Proportional Hazards model, the covariates were age, marital status, income, education, substance abuse, and mental illness. These covariates were included in the data analysis because they may also have had an effect on treatment adherence among the sample population. To analyze the first research question on GBV, I performed a Cox proportional hazards model to determine the effects GBV had on treatment adherence. For the second research question, I conducted a hazards model to assess the effects the different forms of recent GBV (sexual, psychological, and physical) had on treatment adherence and the covariates. The type of GBV was categorical and treatment adherence is binary with yes/no answers. I utilized a Cox proportional hazards model to analyze the length of exposure and treatment adherence with the independent variable being categorical (current or past exposure) and dependent variable (treatment adherence) is binary with yes/no along with the covariates to determine a difference in treatment adherence among victims of past experiences of GBV or current. The sociodemographic variables from the Cox proportional hazards models will answer the third research question. Survival analysis allowed for the examination of GBV and treatment adherence without the interference of covariates. Covariates may alleviate or exacerbate the relationship between GBV and taking HAART medications. It was important that the interaction of covariates with the independent and dependent variables were accurately assessed. I used descriptive statistics to analyze patterns and trends among the sociodemographic variables, i.e. age, race, and income level. Statistical

significance or hypothesis testing are included in survival analysis tests. Cox proportional hazards model tests significance of covariates with the likelihood ratio and Wald test. The likelihood ratio focuses on subtracting 2 times the difference of the log likelihoods of two hazards model, one that includes the covariates (race, age, income, education, etc.) and the other model without the covariates (NCSS, n.d.). This test determines whether the covariates have an effect on the association of interest, which is GBV and treatment adherence. The Wald test ascertains the significance of individual regression coefficients of the covariates (NCSS, n.d.).

### **Threats to Validity**

External validity refers to the degree to which the results of a research investigation can be applied or generalized to other populations (Michael, n.d.). Because the WIHS cohort is mainly comprised of women infected with HIV that have access to care and information, then the results may not be generalizable to other populations such as women infected with HIV without resources. The examination of GBV within the population as a selection criterion may also hinder generalizability. Another threat to external validity was the Hawthorne effect where participants are more likely to adhere to treatment because of participation in a study (Koshar & Kindy, 2006). WIHS participants may be more likely to take better care of themselves and have more positive health outcomes due to being in the study, which provides access to medical resources. This could make finding a true association between GBV and treatment adherence difficult. Generalizability of the results may not be applicable to other populations of HIV-positive women in areas of the US outside of the research sites or internationally

because social conditions and cultural norms may be different. These differences could affect study outcomes. Participants could continue with the WIHS study regardless of their adherence to treatment (Bacon et al., 2005). The WIHS is a longitudinal study that has been in existence for over 18 years so the odds of some participants not adhering to treatment was likely. The WIHS gathered data on all participants throughout the study regardless of negative outcomes. According to Koshar and Kindy (2006), the Hawthorne effect may be an issue in the beginning in research studies, but over time participants' behavior will begin to normalize as time progresses in longitudinal studies.

Internal validity centers on the accuracy of inferences relating to cause and effect or causal relationships in research studies (Creswell, 2013). Because of purposive sampling, selection bias can be an issue. Participants were assigned to groups based on past or recent experiences of GBV or no GBV experiences instead of random sampling. Participants were matched between groups based on other characteristics such as age, income, education, etc. Maturation and history of participants could impact survey responses. Participants change over time with new experiences and knowledge (Creswell, 2013; Koshar & Kindy, 2006). Furthermore, survey responses can vary as participants change mentally, physically, and socially. Repeated testing of WIHS participants with each study visit can impact questionnaire responses and cause an effect. In addition, revisions to WIHS questionnaires can influence data by participants may interpret questions differently, which can change their responses. For history, maturation, and revisions to data collection methods, pilot testing and asking similar questions differently to double check accuracy of answers can reduce effects of these issues within the

research study. Attrition of participants due to the length of the study was another threat to validity. Participants that were lost to follow-up or dropped out of the study had missing data between visits, which differed from those who continued throughout the study and never missed a visit. It was essential to analyze data from all participants to determine differences between participants who remain in the study with those who dropped out (Koshar & Kindy, 2006). Internal validity can also be threatened by an interaction of these threats together.

### **Ethical Procedures**

To gain access to the WIHS dataset, I submitted a concept sheet to the Executive Committee (EC) detailing the study design, hypotheses, and objectives along with variables needed to be included in the dataset. I used secondary data in the data analysis of the study, thus no human participants were harmed during this research study. I sought IRB approval from the Walden University IRB to ensure that all procedures were performed correctly and ethically with minimal risk to participants. There were no ethical concerns related to materials and processes. Confidentiality and privacy of data were ethical concerns related to data collection in that data used for this study was from HIV-positive women and their life experiences with abuse, sexual behaviors, and alcohol and substance use. Participants may not have been honest when giving information unless confidentiality and privacy was ensured. WIHS obtained informed consent from each participant and a certificate of confidentiality to assure participants that no information collected will be disclosed (Bacon et al., 2005). Confidentiality of participant data was maintained throughout this study.

Treatment of the archival data included that anonymity and confidentiality was maintained with the data being de-identified. There were no participant names in the dataset only WIHSID numbers and site numbers were used to identify participants. Certain sites within the WIHS collect data on abuse and violence so there was a minimal chance that site numbers can identify participants within the WIHS. To reduce this, information on which sites collected abuse and violence were given prior to the release of the dataset, and site numbers were removed from the dataset spreadsheet that was used for this study.

I protected and stored the data in a password-protected spreadsheet on my private computer. Only I, the PI, had access to the data once it was received from WDMAC. The data will be destroyed five years after the research study is completed per Walden University's Dissertation Guidebook on required data storage (Walden University, 2014). There was no known conflict of interest.

### **Summary**

The aim of this non-equivalent groups- longitudinal design research study was to determine the effects of the type and time length of GBV on treatment adherence among HIV-positive participants in the WIHS study. Random selection was not possible with this study, which is why I chose a quasi-experimental design. Participants were chosen based on past and current experiences with abuse, violence, and HIV status; and the control group consisted of women who had not experienced abuse and violence. The WIHS revised questionnaires periodically so that the new questionnaires encompassed a mixture of previously used questionnaires that collect data on socio-demographics,

mental health, HIV risk behaviors, and abuse. I measured the association between GBV and treatment adherence with Cox proportional hazards model of survival analysis using SPSS software. Cox proportional hazards model included an independent variable, dependent variable, and several covariates. Age, socioeconomic status, and risky behaviors were just a few confounding variables that also had an impact with treatment adherence. I addressed internal and external validity threats during the data collection process through matching, collecting data at various time points to monitor treatment adherence. I obtained access to the dataset from the WIHS Executive Committee. There was minimal risk to participants since data used in this study was from a secondary dataset. The dataset was de-identified with no personal information being displayed. Participants were anonymous, and confidentiality/privacy was maintained throughout the WIHS study as well as this study. The WIHS dataset provided information that helped to provide insight into the mental and social conditions of women infected with HIV that affected treatment adherence and health outcomes. Results of this study were presented in Chapter 4.

## Chapter 4: Results

The purpose of this quantitative, case-control study was to utilize the HBM to examine the relationship between GBV and treatment adherence among HIV-positive women, controlling for age, education, race, and socioeconomic status. Participants were recruited from the WIHS Cohort. I defined GBV, the independent variable, as physical, sexual, and psychological violence from previous partners or spouse, current partners or spouse, stranger, or someone known but not a partner. I defined treatment adherence, the dependent variable, as taking antiretroviral medication as prescribed. Covariates included age, education, race, socioeconomic status, mental illness, marital status, and substance abuse.

I designed the following research questions and hypotheses to guide my research:

*RQ1:* To what extent does GBV affect treatment adherence among women infected with HIV after controlling for age, race, education, socioeconomic status, mental illness, and substance abuse?

*H<sub>10</sub>:* GBV does not affect treatment adherence among women infected with HIV after controlling for age, race, education, socioeconomic status, mental illness, and substance abuse.

*H<sub>1a</sub>:* GBV does affect treatment adherence, among women infected with HIV after controlling for age, race, education, socioeconomic status, mental illness, and substance abuse.

*RQ2:* To what extent does the time of exposure to GBV (lifetime vs. recent exposure), stratifying for various types of recent GBV (sexual, physical, and

psychological), impact treatment adherence among women infected with HIV after controlling for age, race, education, socioeconomic status, mental illness, and substance abuse?

*H<sub>10</sub>*: The time of exposure to GBV (lifetime vs. recent), stratifying for various types of recent GBV (sexual, physical, and psychological), does not impact treatment adherence among women infected with HIV after controlling for age, race, education, socioeconomic status, mental illness, and substance abuse.

*H<sub>1a</sub>*: The time of exposure to GBV (lifetime vs. recent), stratifying for various types of GBV (sexual, physical, and psychological), does impact treatment adherence among women infected with HIV after controlling for age, race, education, socioeconomic status, mental illness, and substance abuse.

*RQ3*: To what extent do women infected with HIV differ in treatment adherence across the three types of GBV (sexual, physical, and psychological)?

*H<sub>30</sub>*: There are no differences in treatment adherence between women infected with HIV across the three types of GBV (sexual, physical, and psychological).

*H<sub>3a</sub>*: There are differences in treatment adherence between women infected with HIV across the three types of GBV (sexual, physical, and psychological).

In this chapter, I discuss the data collection methods and present the main findings. Data collection included acquiring a secondary dataset from the WIHS, which consisted of demographic and abuse data on HIV-positive women from various ethnicities. To analyze participants' sociodemographic characteristics, I used descriptive

statistics. Lastly, I used Cox proportional hazards model to answer the research questions.

### **Data Collection**

I needed permission to gain access to the secondary dataset from the WIHS. I was required to make many changes to the WIHS concept sheet, which is the application researchers use to get permission to perform research on the study's cohort, before I obtained final approval for my study from the WIHS Executive Committee. For example, the committee required that I open the target population to all HIV-positive women within the WIHS cohort, and not only those of African American descent. The secondary dataset I received from the WIHS included data on 1,411 HIV-positive women and 12,280 follow-up visits.

I divided the study population of women into two groups based on experiences with GBV. Women that had experienced violence were more prevalent within the cohort (62.5%) than women who had not experienced violence (27.7%). Physical violence was more prevalent within the cohort than sexual or psychological violence, (50.7% compared to 38.1% and 34.7%, respectively). Many participants within the sample were more likely to have been African American, unemployed, suffering from depressive symptoms, abused in childhood, currently in a relationship, insured, and adhering to medications. I used the Cox proportional hazards model of survival analysis to measure whether sexual, physical, and psychological GBV influenced treatment adherence among the target population. Sexual GBV was more prevalent in those who were Caucasian or African American, had a history of childhood physical abuse, and were currently in a

relationship. These characteristics had a strong interaction with adherence. Those who experienced physical GBV were more likely to be either Caucasian, African American, or Asian/Pacific Islander, insured, physically abused as a child, and currently in a relationship. For the relationship between psychological GBV and adherence, Caucasian descent, employed, insured, and history of injecting drug use had the strongest interaction. Ethnicity, employment, access to insurance, history of abuse, and current relationship status had a strong interaction with adherence among the sample population. Childhood and previous exposure to abuse seemed to have a greater impact on adherence than recent exposure or exposure between follow-up visits.

The WIHS Executive Committee provided me approval to use their secondary dataset, which contains participants' abuse and adherence data. I obtained IRB approval from Walden University. Participants were recruited from five WIHS sites: Bronx/Manhattan, NY; Brooklyn, NY; Chicago, IL; Washington, DC; and San Francisco/Bay area, CA. These sites collected data on participants' abuse history. Data spanned from Visit 10 through Visit 40 with corresponding dates from April 1, 1999 to September 30, 2014. Visit 10 represented the first visit (baseline) with adherence data. The study population included HIV-positive women of all ethnicities within the WIHS cohort, including African American women. Originally, I had set the age range for the cohort at 18-42 years of age, but I changed the range to 19 to 89 years of age to include all participants within the cohort regardless of age, respectively. This established a more representative study population which I divided into two groups: those who had experienced abuse and those who had not.

The study population was indicative of the larger population of HIV-positive women with all ethnicities represented in the sample (See Figures 1 and 2). According to the CDC (2015), women comprise 20% of new HIV infections in 2013. African American women were the majority of the sample population or cohort as well as the general population of women infected with HIV, 5,128 and 7,448 women, respectively (Figures 1 and 2). Within the WIHS cohort, Caucasian women were the second largest group, as they are also in the general population of women living with HIV/AIDS. The sample population of HIV-positive women in my study mirrored the racial makeup of HIV-positive women in the general population. Most of the participants had completed grades 7 to 11 and high school (64.2%). There was also a relatively high prevalence of substance use and abuse. The rate of IPV among women infected with HIV is 55% (CDC, 2014). Thirty-nine percent of HIV-positive women in the United States have experienced childhood sexual abuse, as had 42.1% in the WIHS cohort. Those that experienced childhood physical abuse were 42 % in the United States and 54.1% in the cohort. Exposure to abuse was prevalent in the sample population as well as in the general population of women living with HIV/AIDS. Most participants were in a relationship with someone they considered a partner (61.1%).

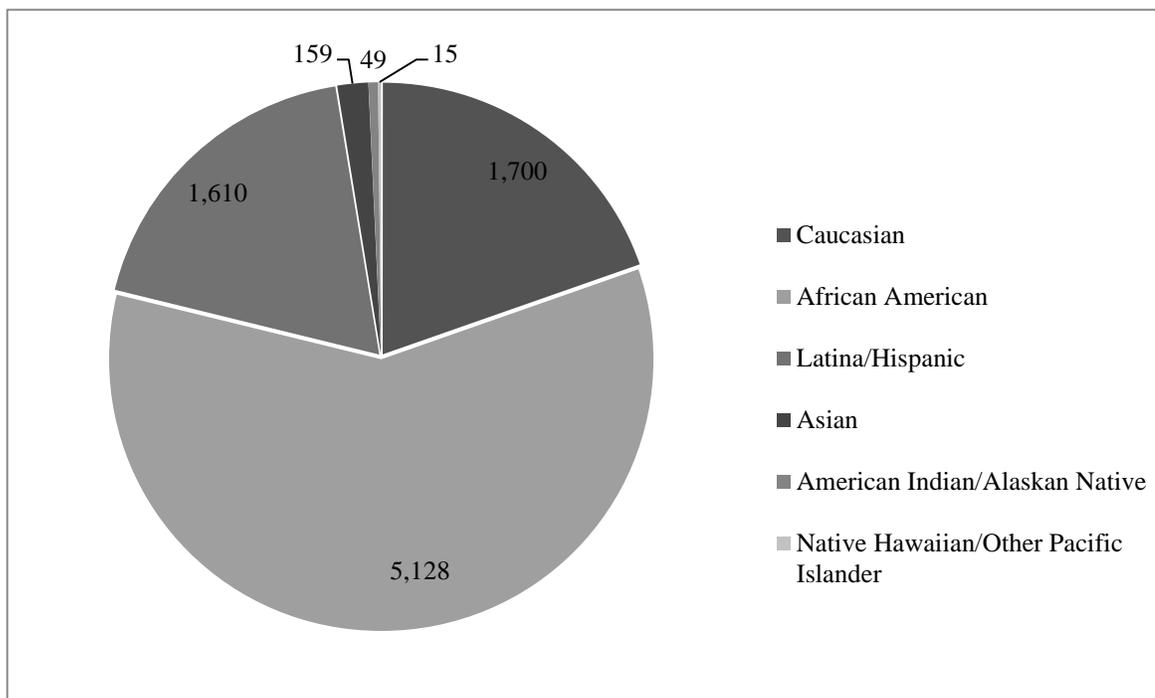


Figure 1. HIV/AIDS new cases among women by race in the general population

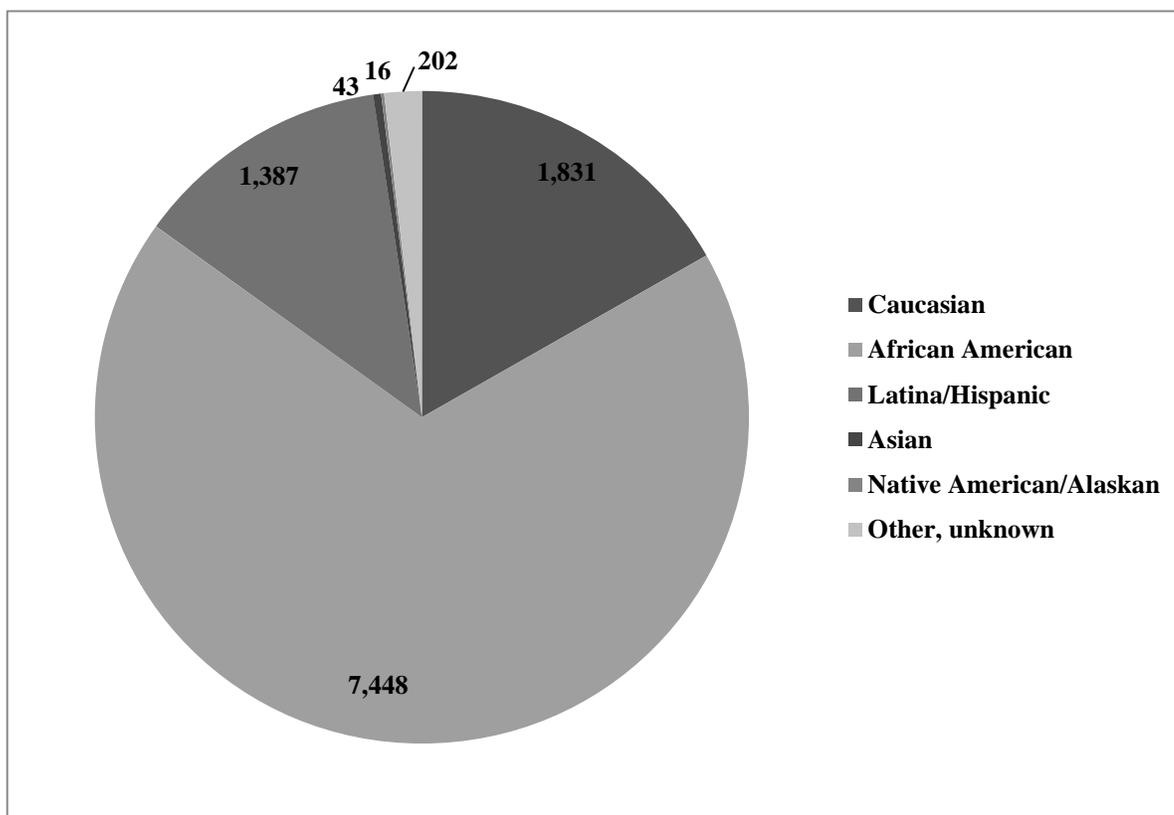


Figure 2. HIV/AIDS new cases among women by race in the WIHS cohort

The participants' characteristics at baseline were as follows: being of African American descent (70.5%); median age at baseline was 35.7 years of age; median age at visit was 39.7 years of age; history of physical abuse (69.3%); currently in a relationship (67.7%); insured (89.0%); high school graduate (30.1%); income of less than \$18,000 (68.4%); unemployed (65.8%). In addition, participants were more likely to own a house/apartment (79.4%); not married or cohabitating (43.2%); to be former smokers (50.3%); have participated in transactional sex (37.0%); have used crack, cocaine, or

heroin (56.8%); have injected drugs (23.8%); have a median CD4 (T-helper) cell count of 413.0; and be adherent (76.7%). Characteristics for participants during follow-up were as follows: African American descent (68.1%); median age at baseline-34.9; median age at visit-45.1; currently in a relationship (61.1%); insured (94.5%); completed grades 7-11 (34.2%); income less than \$18,000 (64.1%). Other characteristics of participants during follow-up included: owned house/apartment (88.4%); not married or cohabitating (40%); former smokers (57.2%); previously used crack, cocaine, and heroin (56.0%); median CD4 count of 475; and adherent (78.6%); (See Table1).

Table 1

*Participant Characteristics at Baseline and Follow-up Visits (n%)<sup>1</sup>*

<b>Characteristic</b>	<b>At Baseline n=1,411</b>	<b>At Visits n=11,459 visits</b>	<b>Percentage of 12,280 visits for both abuse and no abuse categories (n%)<sup>1</sup></b>
Age at visit: Median <sup>2</sup>	39.7	45.1	45
Age at baseline: Median <sup>3</sup>	35.7	34.9	35
Marital Status (Not married or cohabitating)	609 (43.2%)	4,103 (40%)	36.6%
Place of Residence-Own house/apartment	1,121 (79.4%)	9,653 (88.4%)	83.7%
Unemployed	929 (65.8%)	6,998 (64.1%)	61.6%
Insured	1,256 (89.0%)	10,316 (94.5%)	89.9%
Household annual income (< \$18,000)	887 (68.4%)	6,552 (64.1%)	57.8%
Race			
Caucasian	222 (16.2%)	1,831 (16.8%)	16.0%
African American	967 (70.5%)	7,448 (68.1%)	65.4%
Hispanic (Other) <sup>4</sup>	154 (11.2%)	1,387 (12.7%)	12.0%
Asian	8 (.6%)	43 (.4%)	0.4%
Native American/Alaskan	3 (.2%)	16 (.1%)	0.1%
Other/unknown	17 (1.2%)	202 (1.8%)	1.7%
Education			
Grades 7-11	467 (34.1%)	3,738 (34.2%)	32.7%
Completed high school	412 (30.1%)	3,333 (30.5%)	29.1%
Ever been paid for sex	505 (37.0%)	3,880 (35.6%)	34.1%
Smoking status			
Current	679 (49.7%)	4,655 (42.8%)	53.6%
Former	686 (50.3%)	6,217 (57.2%)	41.4%
Crack, Cocaine, heroin use			
Ever	777 (56.8%)	6,104 (56.0%)	53.5%
Current	188 (13.8%)	913 (8.3%)	8.3%
Injecting drug use			
Ever	241 (23.8%)	2,730 (25.0%)	24.0%
Current	25 (1.8%)	99 (.9%)	1.0%
CD4 Count (T-helper cells per mm <sup>3</sup> ), Median	413.0	475	507.6

<sup>1</sup>Percentage of the sample population that reported the characteristics over the span of 12,870 follow-up visits

<sup>2</sup>Median age reported per follow-up visits

<sup>3</sup>Median age reported at baseline

Characteristics that I found to be common in the sample pertaining to violence and abuse were that 62.5% of participants have a history of any abuse- sexual, domestic, or physical, 27.7% of women in the sample did not have a history of abuse. The percentage of women who responded don't know or not applicable to history of abuse was 9.8%. Types of violence found at baseline included: 69.3% (n=882) women had a history of physical violence, 18.4% (n=224) had a history of sexual violence, 38.5% (n=489) participants have a history of domestic coercion (manipulation, threats, controlling behavior), and 37% (n=505) have traded sex for money, drugs, or shelter. Substance use characteristics within the sample population were as follows: 56.8% (n=777) have used crack, cocaine, and heroin in their lifetime, 23.8% (n=241) have injected drugs in their lifetime. Many more of the participants had taken medication as prescribed within the previous six months than those who were non-adherent (76.7%, (n=928); 28.2% (n=202), respectively.

The types of violence determined during the 12,280 follow-up visits were: 42.1% of participants had a history of sexual abuse, 54.1% had a history of physical abuse, 27% had a history of abuse prior to age 17, 39.5% had a history of domestic coercion, 35.6% has traded sex for drugs, money and/or shelter. Fifty-six percent of participants reported previous use of crack, cocaine, or heroin, and 25% reported previous use of injecting drug use in the sample. Adherence increased from baseline (76.7%) to 78.6%, and non-adherence decreased from baseline (28.2%) to 21.4% during follow-up. (Refer to Table 2).

Table 2

*Participant Characteristics at Baseline and Follow-Up Visits (n%)<sup>1</sup>*

<b>Characteristic</b>	<b>At Baseline n=1,411</b>	<b>At Visits n=11,459 visits</b>	<b>Percentage of 12,280 Follow-up visits for both abuse and no abuse categories (n%)<sup>1</sup></b>
History of sexual abuse <sup>5</sup>	224 (18.4%)	4,421 (42.1%)	15.7%
History of physical abuse <sup>5</sup>	882 (69.3%)	5,696 (54.1%)	49.8%
History of abuse prior to age 17 <sup>5</sup>	329 (27.0%)	2,733 (27.0%)	23.8%
History of psychological abuse <sup>5</sup>	489 (38.5%)	4,170 (39.5%)	36.2%
Viral load, Median	217.0	80	853.49
Antiretroviral adherence <sup>6</sup>	928 (76.7%)	7,796 (78.6%)	71.0%
Antiretroviral non-adherence <sup>6</sup>	202 (28.2%)	2,122 (21.4%)	18.7%
Currently in relationship with someone considered a partner	927 (67.7%)	6,672 (61.1%)	61.90%

<sup>4</sup>Participant reported Hispanic descent other than White or Black

<sup>5</sup>History of abuse reported at visit where full abuse history was ascertained

<sup>6</sup>ARV adherence is based on adherence between visits (6 months)

For survival analysis, variables were divided into two categories: time-fixed (do not change over time) and time-dependent (change over time). Time-fixed covariates were age at baseline, race, education, childhood abuse, history of drug use. Time-dependent variables were abuse since previous visit, income, depressive symptoms, smoking status, hazardous drinking, age at visit, antiretroviral (ARV) adherence, missed doses in last 30 days, and currently in a relationship. Two hazard models were performed, the first model tests the effects of GBV (all types of GBV combined) with treatment adherence within the sample population; and the second model tests the effects of each of the three types of recent GBV (sexual, psychological, and physical) with treatment adherence variables along with lifetime (history of) abuse variables.

Table 3

*Hazards Ratios of Covariates Between GBV and Treatment Adherence*

Covariates	Hazard Ratio	95% Confidence Interval for Hazard Ratios	
		Lower	Upper
Age at Baseline	1.004	0.993	1.016
Age at Visit	1.006*	1.003	1.009
Marital Status			
Separated	0.903*	0.812	1.003
Never married	0.896*	0.824	0.973
Race			
Caucasian (Non-Hispanic)	0.939	0.780	1.129
Caucasian (Hispanic)	0.891	0.730	1.088
African American (Non-Hispanic)	0.842*	0.714	0.993
African American (Hispanic)	0.789*	0.626	0.994
Other (Hispanic)	0.915	0.763	1.097
Place of Residence	1.009	0.987	1.032
Employment	0.970	0.910	1.034
Currently have insurance	1.059	0.916	1.225
First reported HAART date	1.000	1.000	1.000
Number of drinks/week since last visit	0.990*	0.986	0.995
Number of years smoked cigarettes	0.997*	0.994	1.000
History of Smoking status	1.000*	0.957	1.046
Current smoker	1.068*	1.002	1.137
Current non-injecting drug user	0.912*	0.836	0.994
Previous non-injecting drug user	1.029	0.840	1.260
Participant ever injected drugs (reported visit)	1.105	0.958	1.273
Ever used crack/cocaine/heroin (baseline visit)	1.085	0.986	1.194
Used crack/freebase cocaine since last visit	1.190	0.990	1.431
Used heroin since last visit	1.133	0.902	1.424
Used (illicit) methadone since last visit	1.130	0.709	1.800
Ever had sex for drugs, money, shelter (baseline visit)	1.039	0.953	1.133
Viral load	1.000*	1.000	1.000
Currently in a relationship	1.000	0.953	1.049

\*p&lt;0.05

According to Table 3, women who experienced GBV and non-adherent to medication were more likely to be separated or never married; of African American descent, engage in hazardous drinking, a previous and current smoker; and a current non-

injecting drug user. These findings were statistically significant. In addition, viral load had a significant effect on the relationship between GBV and treatment adherence.

Table 4

*Hazard Ratios of Adherence and Abuse Variables with GBV*

Covariates	Hazard Ratio	95% Confidence Intervals	
		Lower	Upper
Taken HAART since last visit	0.927	0.784	1.096
Missed dose in 30 days	0.983*	0.970	0.996
Took meds as prescribed in past 30 days	0.953	0.859	1.056
Took meds as prescribed since last visit	0.990	0.923	1.061
Took a medication break for 1 or more days since last visit	0.888	0.59	1.337
Followed the medication schedule closely	1.163*	1.026	1.317
Off treatment for one week or more since last visit	1.008	0.890	1.143
Good job taking HIV meds in past month	1.018	0.914	1.133
Type of HRT taken since last visit	0.962	0.858	1.079
History of psychological abuse	0.950	0.755	1.195
History of physical abuse	0.965	0.750	1.241
History of sexual abuse	0.799*	0.639	1.000
History of any abuse	1.074	0.783	1.473

\*p<0.05

Table 4 displays the hazard ratios of adherence and history of abuse variables as they relate to gender-based violence and treatment adherence among HIV-positive women. Women infected with HIV that experienced GBV were more likely to have taken HAART since last visit, missed a dose in the past 30 days, followed the medication schedule closely, had a history of sexual abuse, and had a history of any (type of) abuse (unspecified). Missed a dose in past 30 days, followed the medication schedule closely, and history of sexual abuse were all statistically significant.

Table 5

*Hazard Ratios of covariates (Participant characteristics)*

<b>Covariates</b>	<b>Recent Sexual GBV</b>	<b>Recent Physical GBV</b>	<b>Recent Psychological GBV</b>
Age at baseline	0.991 (0.960, 1.023)	0.983 (0.966, 1.001)	0.997 (0.989, 1.005)
Age at visit	1.001 (0.972, 1.031)	0.997 (0.980, 1.013)*	0.995 (0.989, 1.002)
Race			
Caucasian (non-Hispanic)	1.138 (0.698, 1.854)	1.283 (0.869, 1.895)	1.081 (0.915, 1.277)
Caucasian (Hispanic)	1.027 (0.608, 1.735)	1.238 (0.822, 1.865)	1.081 (0.906, 1.289)
African American (non-Hispanic)	1.046 (0.661, 1.654)	1.230 (0.851, 1.778)	1.023 (0.877, 1.194)
African American (Hispanic)	1.300 (0.714, 2.367)	1.250 (0.790, 1.979)	1.011 (0.825, 1.240)
Hispanic (Other)	1.033 (0.636, 1.678)	1.214 (0.824, 1.790)	0.999 (0.847, 1.178)
Asian/Pacific Islander	0.949 (0.302, 2.986)	1.359 (0.572, 3.231)	0.872 (0.600, 1.267)
Native American/Alaskan	0.532 (0.097, 2.924)	1.166 (0.248, 5.493)	1.062 (0.551, 2.047)
Marital status	1.012 (0.964, 1.062)	0.997 (0.972, 1.022)	0.998 (0.987, 1.010)
Income	1.013 (0.954, 1.075)	0.968 (0.939, 0.997)	1.000 (0.986, 1.014)
Education	1.043 (0.939, 1.158)	1.065 (1.009, 1.124)*	1.010 (0.986, 1.036)
Insured	1.069 (0.667, 1.713)	1.563 (1.226, 1.993)	1.037 (0.927, 1.160)
Employed	1.051 (0.832, 1.328)	0.974 (0.862, 1.101)	1.011 (0.955, 1.071)
Previous crack, cocaine, heroin use	1.090 (0.762, 1.560)	0.751 (0.637, 0.885)*	1.003 (0.928, 1.083)
Previous smoker	0.989 (0.735, 1.332)	1.029 (0.943, 1.121)	1.007 (0.968, 1.049)
Ever Inject drugs	0.952 (0.569, 1.591)	0.450 (0.344, 0.588)*	1.050 (0.927, 1.190)*
Depressive symptoms	0.999 (0.987, 1.012)	0.992 (0.986, 0.998)*	0.997 (0.994, 1.001)
Currently in a relationship	2.871 (0.180, 45.919)	1.179 (0.542, 2.566)	0.802 (0.697, 0.924)

\*p&lt;0.05

Table 5 includes the demographic characteristics from the second hazards model of each type of recent GBV (sexual, psychological, and physical), which displays that recent physical gender-based violence had the strongest significant interactions among HIV-positive women who were non-adherent to treatment. Asian or Pacific Islander women with history of abuse were 1.359 (.572, 3.231) times more likely to be non-adherent than women of other ethnicities. Caucasian women were 1.283 (.869, 1.895) times more likely for non-adherence. Those who have experienced childhood physical violence had a hazard ratio of 1.649 (1.419, 1.915) than those who had not. Participants that previously injected drugs were 55% less likely to be adherent than those who have not experienced abuse. Age at visit, education, and childhood physical violence were statistically significant in the association between physical GBV and treatment adherence.

Strong predictors found between recent sexual GBV and adherence were being African American with Hispanic descent (HR=1.300, CI= .714, 2.367), Caucasian and non-Hispanic (HR=.698, 1.854), history of childhood sexual violence (HR=1.115, CI=.825, 1.508), and currently in a relationship (HR=2.871, CI=.180, 45.919). Recent psychological GBV affected adherence for those who were Caucasian (HR=1.081, CI=.915, 1.277), African American (HR=1.081, CI=.877, 1.194), educated (HR=1.010, CI=.986, 1.036), and had insurance (HR=1.037, CI=.927, 1.160). Previous smoker and depressive symptoms were least likely to affect adherence (See Table 5).

Table 6

*Hazards Ratios of Abuse and Adherence Covariates*

<b>Covariates</b>	<b>Recent Sexual GBV</b>	<b>Recent Physical GBV</b>	<b>Recent Psychological GBV</b>
History of any abuse	0.853 (0.602, 1.208)	0.855 (0.713, 1.025)*	0.972 (0.891, 1.059)
Childhood sexual violence	0.968 (0.705, 1.330)	1.066 (0.905, 1.257)	1.013 (0.939, 1.093)
History of domestic coercion (psychological violence)	0.999 (0.791, 1.261)	0.799 (0.706, 0.905)*	1.046 (0.987, 1.107)*
History of abuse at 17yrs or younger	0.915 (0.674, 1.242)	0.951 (0.808, 1.119)	0.993 (0.922, 1.070)
Childhood physical violence	1.115 (0.825, 1.508)	1.649 (1.419, 1.915)*	1.001 (0.935, 1.072)
Taken HAART since last visit	1.008 (0.653, 1.557)	0.687 (0.558, 0.846)	0.952 (0.881, 1.029)
Missed dose in 30 days	0.997 (0.971, 1.024)	1.054 (1.040, 1.069)*	1.008 (1.001, 1.014)
Took meds as prescribed in past 30 days	0.928 (0.775, 1.111)	1.032 (0.942, 1.132)	0.991 (0.949, 1.035)
Took meds as prescribed since last visit	0.743 (0.594, 0.930)*	0.571 (0.492, 0.662)*	0.517 (0.482, 0.556)*
Took a medication break for 1 or more days since last visit	1.002 (0.826, 1.215)	1.057 (0.905, 1.235)	1.047 (0.980, 1.118)
Followed the medication schedule closely	0.774 (0.705, 0.848)*	1.000 (0.886, 1.129)	1.021 (0.991, 1.052)
Off treatment for one week or more since last visit	1.065 (0.879, 1.297)	0.849 (0.763, 0.943)*	1.080 (1.019, 1.145)*
Number of days missed a dose of meds in past month	0.951 (0.928, 0.974)*	1.059 (1.040, 1.078)*	1.010 (1.002, 1.018)*
Good job taking HIV meds in past month	0.735 (0.616, 0.878)*	0.777 (0.615, 0.982)*	1.067 (1.005, 1.132)*
Taken HRT since last visit	0.634 (0.464, 0.866)*	0.937 (0.787, 1.116)	0.948 (0.866, 1.037)
Type of HRT taken since last visit	1.087 (0.940, 1.257)	1.018 (0.921, 1.124)	1.002 (0.948, 1.059)

\*\*p &lt;0.05

In Table 6, the hazard ratios of the adherence and abuse variables were analyzed in relation to recent exposure to the three types of GBV (sexual, physical, and psychological). Women infected with HIV who had experienced recent sexual GBV were more likely to be adherent to their HIV meds since their last visit. In addition, variables such as took meds as prescribed since last visit (74.3%, CI=0.594, 0.930), followed medication schedule closely (77.4%, CI=0.705, 0.848), and good job taking meds in past month (73.5%, CI=0.616, 0.878) were statistically significant for women who experienced sexual GBV. In terms of recent physical GBV, participants were more likely to have a history of any abuse (85.5%), psychological violence (79.9%), childhood physical violence (1.649 times), missed a dose in 30 days (1.054 times), took meds as prescribed since last visit (57.1%), and off treatment for one week or more (84.9%) than those who were adherent to treatment. Women who experienced psychological GBV were more likely to have a history of psychological abuse, took meds as prescribed, off treatment for one week or more since last visit, and took HIV meds in the past month than women who were adherent to HIV medications.

### **Summary**

In relation to research question 1, covariates with the strongest interactions between those with GBV experiences and those without were: age at visit, race, income, education, having insurance, employment, childhood sexual or physical abuse, missed dose in the last 30 days, and currently in a relationship. When all three types of GBV are combined into one hazards model, marital status, African American descent, smoking status, drug use, drinking, and viral load had a significant effect on treatment adherence.

Research question 2 focuses on how does the time in which the abuse occurred among the three types of recent GBV influence adherence. The type of abuse experienced whether sexual, physical, or psychological did influence adherence among women infected with HIV. Women with a history of abuse during childhood were less likely to be adherent. Past abuse affected adherence among the sample population. For research question, 3 HIV-positive women within the cohort differed in treatment adherence across all three types of GBV. Non-adherence was more prevalent among participants who had experienced recent sexual GBV. Lifetime prevalence of abuse was more common among those exposed to recent physical GBV. Adherence to treatment was significant among those who experienced recent psychological GBV.

History of abuse and violence along with previous substance use were barriers to adherence among the HIV-positive women in the sample population. Age did not influence adherence. Being in a relationship seems to have been a positive predictor of adherence within the sample population. Mostly self-reported data was used in this study, which can explain discrepancies such as numerous responses of owning a home or apartment and unemployment being prevalent in the sample population along with missing doses, accompanied by several responses of following the medication as prescribed. Implications from these results can help identify issues and conditions that contribute to HIV medication adherence among women infected with HIV. These implications will be investigated further in the next section.

## Chapter 5: Discussion, Conclusions, and Recommendations

I conducted this study to ascertain whether past or present experiences of GBV had an effect on treatment adherence among HIV-positive women. Previous literature showed that women with a history of abuse have worse HIV outcomes than women who are not abused (El-Bassel et al., 2011a; Schafer et al., 2012; Trimble et al., 2013). Some of these outcomes include mental illness, delayed entry to care, and a faster progression to AIDS. Treatment adherence is essential to the improvement of health and well-being of HIV- infected women. It is imperative that barriers to treatment are identified and addressed to improve the lives of women infected with HIV.

GBV did not have a significant effect on adherence among the WIHS cohort with 71% of the sample population adherent to HIV medications whether they experienced abuse or not. Among the various types of abuse, recent physical GBV had the most significant interaction with adherence. Past abuse negatively influenced adherence within the cohort. There were several covariates that interacted with the association between GBV and adherence such as age, race, income, education, employment, missed a dose in the last month, currently in a relationship, history of any abuse, history of psychological violence, childhood abuse, physical violence, and off treatment for one week or more. The longitudinal nature of this study may have also played a role in the non-significant effect of GBV on adherence. Adherence improved among the cohort over time, which can be attributed to maturation and participation in research.

### **Interpretation of the Findings**

Among the WIHS cohort, I found that GBV did not influence adherence, which is contradictory to previous literature. Previous researchers found that women who experienced violence were less likely to be adherent to treatment (Dale et al., 2014; Olem et al., 2014; Schafer et al., 2012; Trimble et al., 2013). However, many of these studies were cross-sectional and thus focused on adherence at one point in time, while this study was longitudinal and focused on adherence over time. The difference in methodology may have played a role in the study outcomes because adherence can change over time. These changes can become insignificant when looking at the overall picture of adherence. I found the strongest interaction between covariates among HIV-positive women that experienced recent physical GBV. Covariates with the strongest interaction among those who experienced violence and those who did not were: age at visit, race, income, education, having insurance, employment, childhood sexual or physical abuse, missed dose in the last month, and currently in a relationship. In addition, women with a history of abuse were less likely to be adherent. Barriers to adherence among the cohort were a history of abuse and previous substance use. Age did not have a large effect on adherence. Most likely, as the participants aged during the study, they were more likely to be adherent and understood the importance of taking medications as prescribed. Currently being in a relationship was a positive predictor of adherence among the HIV-positive women. Emotional support can provide motivation for healthy behaviors including adherence. Adherence was high within the cohort regardless of the type of

violence experienced and the time in which the violence occurred. More than 70% of the cohort were adherent.

Depressive symptoms, age at visit, and taken HAART since the last visit were predictors of adherence among the sample, which confirms outcomes found in previous literature. For example, Tyler-Viola et al. (2014) determined that depression symptoms, age, and self-efficacy were predictors of medication adherence among a sample of HIV-positive women. Age at visit influenced adherence only for those who experienced recent sexual GBV. Race, childhood sexual or physical violence, and having insurance were also predictors of treatment adherence regardless of the type of recent GBV experienced. Insurance can provide access to care, which enables participants to seek and receive HIV care including HIV medications. Childhood sexual or physical violence was prevalent among the sample. Adherence to treatment was prevalent as well. Women who experienced childhood abuse had worst HIV outcomes than those who had not experienced childhood abuse including not adhering to medication (Clum et al., 2009; Schafer et al., 2012). Although, participants in the WIHS study experienced abuse in childhood, they were still able to maintain adherence throughout the study. I found that past abuse or violence had a larger impact on treatment adherence than recent abuse or violence. This finding contradicts previous research.

There were racial differences in treatment adherence according to the different types of recent GBV. When all GBV types were combined, being of African American descent was statistically significant in relation to treatment adherence. In addition, there was a strong interaction between adherence and sexual GBV among African American

women. For recent physical GBV, the interaction with adherence was strongest among Asian and Pacific Islander women. Psychological GBV had the strongest interaction with adherence among women of Caucasian descent. This study included many underrepresented groups such as Asians/Pacific Islander and Native American/Alaskan women. Little information is known about the health outcomes of women in these groups, which proves that more research studies should include these groups.

Women currently in a relationship were also more likely to be adherent despite experiencing GBV. This is contradictory to literature that has shown that women were less likely to be adherent to HAART when dealing with violence (Lopez et al., 2010). For participants in my study, being in a relationship may have increased adherence by giving women support and motivation to adhere to treatment.

The HBM helps to explain and predict behavior by focusing on the knowledge individuals use to assess the benefits and consequences of complying with medical treatments, and on how individuals adopt positive health behaviors to eliminate negative behaviors (BUSPH, 2016). Previous smoking and drug use were common throughout the cohort. Participants were taking active roles in improving their health by eliminating negative health behaviors. This finding can explain why treatment adherence was more prevalent than non-adherence in the sample. In addition, time in the study can also play a role in adherence. Adherence was not measured until visit 10 within the cohort. During the first 10 visits, participants learn about HIV treatment options, how to manage the disease, and conditions and issues that HIV-positive women often face. Because of access and availability of information to these women due to their participation in the WIHS

study, their knowledge and understanding of HIV was increased, which made treatment adherence a priority for improving their health and well-being. Many women in the cohort had health insurance which provided them with access to information and treatment (Aziz et al., 2011). This access gives women insight into the importance of adhering to treatment, which is more likely to motivate them to take HAART to improve their health. Being in a relationship was another predictor of adherence. This finding shows how emotional support from family and friends can provide motivation for women to seek and adhere to treatment. Not having to deal with HIV infection alone can encourage a person to manage their disease to improve her health.

### **Limitations of the Study**

Self-reported questionnaire data was a limitation of the study. Participants provided information on surveys based on their own perceptions, knowledge, and attitudes of the questions being asked. For example, many participants did not answer the questions pertaining to violence and abuse. Answering these questions may have been too difficult or participants may not have wanted to divulge that type of information about them. Lack of responses may have skewed the results, and the prevalence of GBV among women infected with HIV may have been underreported. There were several nonresponses for the abuse variables, especially sexual abuse, which played a role in some findings being non-significant. Another issue was that the repetition of the same questionnaires during each follow-up visit can predict participants' responses. Some responses may change over time, while others may not. Furthermore, some participants may have continued to skip certain questions that they did not want to answer.

Another limitation was that I used purposive sampling instead of random sampling. Purposive sampling was more feasible for this study because to accurately investigate GBV and treatment adherence, I had to choose HIV-positive women with abuse experiences. Also, I needed to include women who had not experienced abuse, but were taking HIV medications as a control group. Random sampling within the WIHS cohort would have excluded many women who met the eligibility criteria while including those who did not meet the criteria. Although I used purposive sampling in this study, the sample population was quite representative of the general population in terms of race and ethnicity. There were more women who had experienced GBV than those who had not.

I investigated GBV in this study because there was no way to differentiate who perpetrated the violence. Knowing who committed the violence in HIV-positive women's lives can provide insight into their behaviors and attitudes, and to how they cope with everyday life. In addition, knowing who the perpetrator was could have provided more insight as to how or why women infected with HIV managed treatment adherence and health conditions in spite of abuse. Women who face IPV may have a different outlook or coping behaviors than women who deal with child abuse or GBV from someone other than a partner.

### **Recommendations**

Further research should include determining health outcomes of HIV-positive women based on the type of abuser. GBV is a broad term that also encompasses IPV-abuse from spouse or partner along with violence from relatives, friends, strangers, etc. IPV can be a continuous problem because being in a relationship with an abuser causes a

frequent occurrence of violence for women. Investigating health outcomes based on who committed the abuse can provide information on how women cope with abuse.

Using focus groups or taped interviews may be helpful for research focusing on abuse and violence. Women may be more inclined to discuss GBV while in a group with other women experiencing the same thing. Qualitative studies, such as phenomenological studies, that provide a narrative of abuse experiences can offer an accurate outlook of violence and abuse among HIV-positive women. Women may talk more if placed in more personalized settings such as counseling rather than answering questionnaires.

Treatment adherence is essential to managing HIV disease. Many HIV-positive women may have other illnesses with HIV such as Hepatitis B and C, diabetes, cardiovascular disease, and other sexually transmitted infections. These illnesses require medications for treatment. Since treatment adherence was prevalent within the WIHS sample cohort, it may be beneficial to explore treatment adherence of chronic conditions and co-infections with HIV to establish if the presence of these conditions increase or decrease HIV treatment adherence in the target population. Having to remember to take other medications may increase treatment adherence in women infected with HIV.

### **Implications**

There are few researchers that investigate the direct relationship of violence and HIV and other mediating factors such as PTSD, depression, substance abuse, and alcohol use (El-Bassel et al., 2011b, Illangasekare et al., 2012; Siemieniuk et al., 2013). This research study illustrated that the various types of GBV (sexual, physical, and psychological) does not have a significant effect in treatment adherence within the

sample population. However, depressive symptoms and substance use were common among participants in this study. Women who are victims of GBV often have mental illness and handle these problems with drug use which can exacerbate health issues and circumstances (El-Bassel et al., 2011b). Childhood abuse did influence treatment adherence among women infected with HIV in the sample. Interventions and programs should focus on helping women cope with childhood trauma and other life circumstances such as poverty, mental illness, stress, addiction, etc., which can pose a distraction to medical care and disease management.

Family support is vital to the well-being of HIV-positive individuals. Being in a relationship was a strong predictor of treatment adherence in this research study. Not going through HIV alone can provide support and motivation to HIV-positive women. Moral support from family, friends, and significant others gives women with HIV a reason to adhere to treatment and seek care. HIV-positive individuals were more likely to be adherent when in a relationship (Remien et al., 2005). In addition, social support from others provides motivation to adhere to treatment including reminders to take medication as prescribed. Receiving familial support may be a benefit to treatment adherence in giving women living with HIV a purpose to live a long life.

Violence against women is a societal problem that many women face daily. HIV-positive women are at a greater risk for violence than HIV-negative women (Mittal et al., 2013). Childhood violence and abusive relationships can cause negative health outcomes for victims. It should be routine for HIV care to include asking women infected with HIV questions pertaining to violence and abuse. This type of care can be beneficial to

women experiencing abuse by providing them an outlet to get help. Seeking HIV care may be the initial entry points to care these women need to better their health and overall lives. Many of the participants in the target population had insurance, which could have played a role in access to care. People who have medical insurance are more likely to visit the doctor to get necessary testing and treatment (Aziz et al., 2011). Having access to care strengthens the likelihood of receiving and adhering to treatment. Insurance is one less worry people living with HIV should deal with. Changes to how HIV is treated has made it easier for HIV-positive women to comply with treatment. Highly active antiretroviral therapy as a single pill is less difficult to take daily. Sax, Meyers, Mugavero, and Davis (2012) found that HIV-positive individuals whose treatment consisted of a single pill were more likely to be adherent than those who took three or more pills in a day. The improvement of HIV treatment from many pills a day to a single pill may be a factor in the increase of treatment adherence among HIV-positive individuals.

This study had a large sample size of 1,411 HIV-positive women prescribed HAART. Most studies focusing on violence against women and HIV have small sample sizes, which makes it difficult to determine accurate outcomes on the relationship between violence and HIV (Illangasekare et al., 2011; Malow et al., 2013; Trimble et al., 2013). A large sample size increases generalizability of results because of the representativeness of the sample population. Large study populations provide insight into the relationship of GBV and HIV among HIV-positive women from various backgrounds. More studies of this nature should be performed to get more insight into

treatment adherence among women experiencing abuse, past or present. Previous researchers used cross-sectional studies, and only investigated treatment adherence and violence at a certain point in time. Longitudinal studies show changes in association of variables over time. This research study was longitudinal following participants over 12,860 follow-up visits where treatment adherence can change over time depending on various circumstances. Following HIV-positive women over a span of time provides a more accurate picture of the barriers and predictors of treatment adherence among women dealing with recent and childhood abuse. It is essential to look at treatment adherence over the life-span of HIV-positive individuals to add to the literature on barriers to treatment and health outcomes of people living with HIV.

Screening for GBV, IPV, and childhood trauma can improve HIV care and delivery of treatment. HIV-positive women should receive the necessary help for all their needs including treatment. Counseling and group discussions can provide support and encouragement which can motivate women to adopt positive health behaviors e.g. smoking cessation and leaving an abusive relationship. Positive health behaviors are vital to prolonging the lives of HIV-positive women and improving their physical, mental, and emotional wellbeing.

### **Conclusion**

Treatment adherence is necessary for the improvement of prolonging the lives of women infected with HIV. Education, income, and access are all important factors in adhering to HIV medications. Having knowledge and understanding of HIV management increases the likelihood of adherence. GBV was prevalent among the sample population,

and thus a problem among HIV-positive women. Violence is not a problem that women deal with only in adulthood, but throughout their entire lives. Childhood abuse can have an impact on treatment adherence among women with HIV regardless of the type of abuse experienced. It is important to provide women with the necessary skills to survive violent experiences, heal from them, and leave abusive relationships.

Women face a myriad of issues including violence, poverty, sexism, discrimination, mental illness, and drug use. These circumstances can exacerbate health outcomes and increase mortality. HIV care should not only include HIV medications but counseling to help women handle circumstances that come their way. These women's lives may change over time, which means their needs may change over time. HIV care should be tailored to everyone based on needs and circumstances. Proper HIV care can improve treatment adherence as well as the overall health and well-being of women infected with HIV. Social conditions are just as vital to physical health as treatment. Access to treatment can be mute if HIV-positive women still must cope with negative environmental conditions. Identifying and addressing barriers and predictors to treatment can improve access and delivery of services to people living with HIV.

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