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Predictors of HIV Testing Among Individuals Diagnosed With Bipolar Disorder

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Walden University
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Abstract

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Research on rates of HIV testing among individuals diagnosed with Bipolar Disorder (BPD) is limited, while HIV infection continues to rise among BPD individuals. The problem is that BPD individuals are at high risk for HIV infection due to non-adherence to treatment for bipolar disorder and manic episodes that can lead to high-risk behaviors. The goal of the study was to examine the association between selected demographic variables, having a bipolar diagnosis, engaging in high-risk behaviors, inability to afford treatment for bipolar disorder, non-adherence to treatment for bipolar disorder, and substance abuse, and their relationship to obtaining an HIV test (the dependent variable) for individuals with BPD. The epidemiologic triangle model served as the theoretical model to assist with interpreting findings. Data collected from 383 BPD diagnosed individuals from the 2007 National Health Interview Study were analyzed using binary logistic regression, chi-square, and multiple logistic regression methods. The results indicated that all 5 behavioral independent variables were significantly associated (p=.000) with obtaining an HIV test. Significant associations were also found for demographic variables (race, gender, and homelessness) as confounding factors that influenced HIV testing among BPD individuals. Implications for positive social change are increased education on the risks of HIV infection and the need for appropriate HIV testing among BPD diagnosed individuals in an effort to protect the health and welfare of this vulnerable population.

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Dedication

I dedicate my dissertation first of all to God, who gives me wisdom and strength to complete this journey. To Jesus Christ, who is my rock and shield when confused and lost. To my husband, Gérard Decoline, who provided support and understanding throughout this process. To my nine children: Jerry, Greg, Alex, Lisa, Terry, John, Samuel, Sarah, and Chris who encouraged and stood by me during the writing of the dissertation and the school years.

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Chapter 1: Introduction to the Study

Introduction

Mental illness remains a serious public health issue and its prevalence has increased in the past decade (Centers for Diseases Control and Prevention [CDC], 2011). Mental illness has been viewed as a financial burden for the United States, in which $300 billion was spent in 2002 on treatment (CDC, 2011). In 2011, the CDC reported that 25% adults living in the United States were mentally ill (CDC, 2011). Most past studies have focused mainly on mental illness as a whole but not singularly on bipolar disorder (BPD), which has affected 5.7 million American adults or about 4 % of the population (American Psychiatric Association [APA], 1994; CDC, 2011; World Health Organization [WHO], 2008). BPD is a serious mental illness that causes shift in the individual's brain, or changes in their moods. Mental health problems can affect almost anyone at any time in their lives; individuals with HIV have been reported to have a higher rate of mental illness than the general population (Desai & Rosenheck, 2004). This high rate of mental illness is often attributed to high risk sexual behaviors, drug injection, needle sharing or paraphernalia, and the low frequency (less than 50%) of HIV testing undergone among individuals diagnosed with some form of mental illness (Desai & Rosenheck, 2004; Meade & Sikkema, 2005a, 2005b, 2007; Meade & Weiss, 2007; McKinnon, Cournos, & Herman, 2002; Rosenberg et al., 2001; Senn & Carey, 2008).

Little research, however, had been conducted on the relationship between BPD and high risk behaviors, inability to afford treatment, non-adherence to treatment, and HIV testing, which could be instrumental in decreasing the spread of HIV among this

population. Due to the prevalence of HIV among mentally ill individuals, this study focused on examining the effect of the following predictors—sex exchanged for monetary gain, men having sex with other men, having sex with an infected partner, substance abuse other than alcohol and tobacco, inability to afford treatment, non-adherence to treatment for BPD with HIV testing among BPD individuals, specifically BPD groups residing in the United States.

In this chapter, I provide a description of mental illness, BPD, and high risk behaviors including sex exchanged for monetary gain, men having sex with other men, having sex with an infected partner, substance abuse other than alcohol or tobacco, and needle or paraphernalia sharing, non-adherence to treatment for BPD—as well as their relationship with HIV testing. This chapter also includes the problem statement, purpose of the study, research questions and hypotheses, theoretical framework of the study, nature of the study, definitions of key terms, assumptions, scope and delimitations, limitations, and significance of the study, recommendations for future research, and implications for positive social change. The potential positive implications for social change involve enhancing HIV testing among individuals diagnosed with bipolar individuals to decreasing the spread of HIV. This chapter includes a discussion of the research design and procedures used by the National Health Interview Survey 2007 (NHIS) for collecting and analyzing their data (CDC, 2009).

Background

Mental health is defined as an individual's ability to perform his or her daily living tasks, function as a productive member of his or her community, and deal with stressful

events (CDC, 2011; WHO, 2008). The Diagnostic and Statistical Manual, 4th edition (DSM-IV) describes mental illness as disorders of the brain that are classified as dysfunction of the mood, thinking process, or behavior (APA, 1994). Mental illness has been viewed as a financial problem for the United States, on which $300 billion was spent in 2002 for treatment (CDC, 2011). It was reported that 25% of adults living in the United States are mentally ill (CDC, 2011). People with serious mental illness (SMI) die, on average, 25 years earlier than the general population. The mean age at death for all deceased was 47.7, corresponding to an average of 32 years of potential life lost per patient (CDC, 2011). Mental illness, as categorized, includes: major depressive disorder, anxiety disorder, BPD, schizophrenia/schizoaffective disorder, and others (CDC, 2011).

BPD is a mental illness historically referred to as manic depressive disorder or manic depression (APA, 1994). There are several types of Bipolar, and they include the following: “Bipolar I Disorder, Bipolar II Disorder, Cyclothymia, and BPD Not Otherwise Specified” (APA, 1994, p.350). To receive a diagnosis as bipolar, the individual has to have experienced at least one manic episode, which is called “first episode of mania” (APA, 1994). BPD has “12-month prevalence,” and about 2.6 of all adults in the United States have BPD. Among that group, 82.9% or 2.2% of people who have the illness are categorized as severe (National Institute of Mental Health, 2008).

BPD has been diagnosed as a brain disorder causing changes in the individual’s mood and impairing his or her abilities to function fully in their environment (APA, 1994). As a result, most individuals with BPD are impulsive and involved in high-risk activities. Sex with several partners without protection, promiscuity, sexual intercourse

with homosexuals or bisexuals, drug use through injection, and needle sharing have all been indicated as frequently occurring high risk behaviors during a manic episode (Brown, Lubmen, & Paxton, 2009; Hariri, Karadag, Gokalp, & Essizoglu, 2011; Loue, Sajatovic, & Mendez, 2011; Malow et al., 2006). Impulsiveness led to poor judgment in making decisions relative to well-being and health, which likely related to non-adherence to medications and a low occurrence of testing for HIV (Meade & Sikkema, 2005). BPD affects men and women equally. It usually appears between ages 15–25 and more than 5.7 million American adults (or about 2-6% of the population age 18 and older) have BPD (APA, 1994).

According to DSM-IV of the APA (1994), individuals diagnosed with Bipolar I Disorder have been reported to experience more severe manic episodes, have a suicide rate of 10-15%, have violent tendencies, engaged in high risk behavior, be characterized as "antisocial," and have higher work-related catastrophes than individuals with a Bipolar II diagnosis. BPD affects people worldwide and has been a burden to society across the globe (WHO, 2012). During a manic episode, the individual's mood changes from ecstatic to unhappy. The period of joyfulness is followed by delusional thoughts in which the person believes that he or she is better than anyone else (i.e. hyper religious, a messenger of God, lack of judgment, writing a check without provision; APA, 1994).

The depressive episode involves a period of irritability, lack of interest in previously enjoyed activities, and feelings of guilt, isolation, helpless, and hopeless, which is followed by increased of suicidal thoughts (APA, 1994; Grant et al., 2005; Martinowich et al., 2009). The first manic episode occurs at the age of 25 for most cases,

during the early teenage years for some, and in the early 50s for others (APA, 1994). This manic episode can last from a couple weeks to "several months", depending on the method of intervention in addressing the symptoms, such as hospitalization, for instance (APA, 1994).

BPD also occurs with other comorbid conditions like psychosis, heart disease, overweight, substance abuse or dependence, diabetes, and thyroid problems (APA, 1994). The signs and symptoms of BPD include racing thoughts, mood swings, hypersexual activities, impulsiveness, high self-concept, overspending, irritability, increased or decreased need for sleep, happy/sad, lack of interest, suicidal/homicidal ideations, and loneliness (APA, 1994).

Treatment for BPD has been proven to be effective in BPD recovery processes (Sajatovic et al., 2007). Having access to treatment facilities, the ability to purchase prescriptions, and adherence to treatment were reported to be associated with improved functioning among individuals diagnosed with BPD (Sajatovic et al., 2007). Adherence to Bipolar treatment (such as prescribed drugs, counseling, therapy, and psychosocial rehab) was reported to enhance recovery and prevent relapse, hospitalization, and drug use as a coping method for symptoms of BPD (Baldessarini, Perry, & Pike, 2008; Basco & Smith, 2009; Sajatovic et al., 2007). BPD individuals who adhered to their medications were reported to be productive members of their communities (Baldessarini et al., 2008; Basco & Smith, 2009; Cruz, Miranda, Vedena, &Miasso, 2011; Sajatovic et al., 2007). Non-adherence to bipolar treatment could be intentional or unintentional (Berk et al., 2010).

Intentional non-adherence to medications depended on the individual's decision to stop compliance, possibly including the belief that treatment was not needed (Berk et al., 2010). Unintentional non-adherence to treatment, then, involved many factors including the inability to afford treatment, lack of access to treatment facilities, and symptomatic to evaluate the need for treatment for the illness (Aagaard, Vestergaard, & Maarbjerg, 1988; Aagaard &Vestergaard, 1990; Baldessarini et al., 2008; Berk et al., 2010; Colom & Vieta, 2002; Elinson, Houck, & Pincus, 2007; Thomas, Smith, Stewart, Levine, & Hampel, 2008). Non-adherence to treatment for BPD was suggested to be the cause of relapse, functional impairments, hospitalizations, and drug use, which prevented individuals from being productive members of their communities (Baldessarini et al., 2008; Basco & Smith, 2009; Sajatovic et al., 2007).

The CDC (2011) defined HIV as a human immunodeficiency virus that progressed to a more severe form called acquired immune deficiency syndrome, or AIDS (CDC, 2011). HIV has been known to damage an individual's body through blood cells (CD4+T cells) destruction. These specific cells are called immune defense cells, which assist the body in fighting infection (CDC, 2011). HIV is spread through infected bodily fluids (such as blood, semen, breast milk) and sharing drug paraphernalia contaminated with HIV-infected blood (CDC, 2011). HIV can also be transmitted due to engaging in high-risk behaviors such as unsafe anal sex, vaginal, and oral sex with a partner who has the virus; sharing infecting drug needles and paraphernalia; as well as transfer the virus from mother to the newborn during labor (CDC, 2011). HIV was first discovered in Congo, Africa in a male in 1959, but scientists had not been able to trace the origin of the

virus (CDC, 2011). The spread of HIV through the United States started in the 1980s (CDC, 2011). Through treatment, people were able to live with HIV for many years before AIDS progressed through their system (CDC, 2011).

The CDC reported that about 1.2 million people in the United States were HIV positive, and 1 in 5 people were not aware of their infection (CDC, 2011). As noted by CDC, almost 1,148,200 people 13 years of age and above have HIV, and about 207,600 or (18.1 %) do not have knowledge of their HIV status (CDC, 2012). For the past 10 years, the rate of HIV had augmented. The yearly amount of new HIV cases, however, continued to stabilize (CDC, 2012). Recently, the incidence rate of HIV had stabilized to nearly 50,000 people affected yearly (CDC, 2012). In the United States some groups are more at risk than others of being affected with the virus. It was highlighted that the incidence of HIV infection among severely mentally ill individuals was several times higher (5% to 23%, compared with a range of 0.3% to 0.4%) than the overall population (Meade & Sikkema, 2005; WHO, 2008).

Most studies conducted in the past focused primarily on mental illness and HIV (Cournos et al., 1991a, 1991b), and had been broad, and little research was done regarding HIV and BPD specifically(Rosenberg et al., 2001). In a study conducted by Rosenberg et al (2001), the results indicated that HIV was “8 times higher in mentally ill people than other U.S. population” (p. 31). Factors associated with the high rate of HIV among mentally ill people were high-risk behaviors that included unprotected sex, sex exchanged for money, drug use, and sharing paraphernalia (Carey, Carey, & Kalichman, 1997; Cournos et al., 1991a; Empfield et al., 1993; Lee, Travin, & Bluestone, 1992;

Meyer et al., 1993; Rosenberg et al., 2001). Several researchers have revealed that the rate of HIV remained excessively high among mentally ill people due to high- risk sexual activities, drug injection, and less than 50% of mentally ill people undergoing testing for HIV (Meade & Sikkema, 2005a,2005b, 2007; Meade & Weiss, 2007; McKinnon, Cournos, & Herman, 2002; Senn & Carey, 2008).

Treatment for BPD has been effective in controlling the symptoms when taken as indicated by physicians (Baldessarini et al., 2008; Basco & Smith, 2009; Sajatovic et al., 2007). Adherence to BPD treatment (such as prescribed drug, counseling, therapy, and psychosocial rehab) was reported to enhance recovery and prevent relapse, hospitalization, and drug use as a method of coping with the symptoms of BPD (Baldessarini et al., 2008; Basco & Smith, 2009; Sajatovic et al., 2007). Adherence to treatment for BPD has been an effective technique in treating the disorder (APA, 1994). Individuals diagnosed with BPD who adhered to their treatment were reported to be productive members of their communities (Baldessarini et al., 2008; Basco & Smith, 2009; Gaudiano et al., 2008; Sajatovic et al., 2007).

Desai and Rosenheck (2004) noted that health care provider have viewed HIV testing as a mean for combating the spread of HIV worldwide. Many factors have been associated with low HIV testing among American citizens and other countries in the world. These factors included age, race/ethnicity, marital status, income and education-level, psychiatric symptoms, and homelessness. It was suggested that the most at-risk group was mentally ill individuals (Desai & Rosenheck, 2004). A handful of research on the BPD issue has demonstrated a significant association between high-risk behaviors

and medication adherence among individuals diagnosed with BPD, yet little investigation has been done regarding these predictors/factors (sex exchanged for monetary gain, men having sex with other men, having sex with an infected partner, substance abuse other than alcohol or tobacco, non-adherence to treatment for BPD) and their role in HIV testing among bipolar individuals. HIV testing is the first step in preventing the risk of HIV spread. Abundant research has been conducted on the mentally ill as a group, but not specifically on BPD's effect on HIV testing (Desai & Rosenheck, 2004; Senn & Carey, 2009).

In the past few decades, many studies were conducted on the relationship between HIV infection and mental illness, including bipolar, schizophrenia, schizoaffective, and depressive disorders. The findings of this body of research indicated that factors such as non- adherence to BPD medications and high-risk behaviors during the manic phase resulting from non-adherence to treatment for BPD may play a role in individuals not being tested for HIV, for primary and secondary prevention (Hariri et al., 2011; Meade & Sikkema, 2005; Rosenberg et al., 2001). More research is needed due to an excessive increase in HIV prevalence among mentally ill individuals, a lack of research on BPD and HIV testing, and to increase awareness on the benefit of both treatment for BPD and HIV testing among the BPD population.

Problem Statement

Non-adherence to treatment is a problem among individuals diagnosed with Bipolar as it results in high-risk behavior, which can lead to HIV infection (Gaudiano et al., 2008). Non-adherence to treatment for BPD is common among individuals with the

disorder (Cruz et al., 2011; Gaudiano et al., 2008; Sajatovic et al., 2007). It was reported that over 60% of people diagnosed with BPD did not adhere to their treatment (Gaudiano et al., 2008). Non-adherence to treatment was related to relapse, hospitalization in order to address manic phase, and an increase in the severity of the symptoms (Cruz et al., 2011; Gaudiano et al., 2008). Individuals diagnosed with BPD who do not adhere to treatment place themselves at risk for HIV infection due to high-risk behaviors such as unprotected sex, sex exchanged for money, having sex with several partners, and drug use through injecting needle (Carey et al., 1997a ; Desai & Rosenheck, 2004; Cournos et al., 1991a ; Empfield et al., 1993; Hariri et al., 2011; Lee et al., 1992; Marlow et al., 2006; Martinowich et al., 2009; Meade & Sikkema, 2005a; Meyer et al.,1993; Rosenberg et al., 2001a; Senn & Carey, 2009;Thompson et al., 1997).

Despite ample research conducted on high risk behaviors among individuals with BPD, and preventive intervention programs (such as being tested for HIV to reduce the spread of HIV), testing for HIV infection among BPD continues to decrease (Gordon, Carey, Maisto, & Weinhardt, 2008; Hutton, Lyketsos, Zenilman, Thompson, & Erbelding, 2004; Rosenberg et al., 2001;). Little investigation has been done on the relationship between high-risk behaviors (such as sex exchanged for monetary gain, men having sex with men, having sex with an infected partner), inability to afford treatment, non-adherence to treatment, substance abuse other than alcohol or tobacco, and HIV testing among individuals diagnosed with BPD. While HIV testing decreases the spread of the virus, research on HIV testing among individuals diagnosed with BPD is limited. The increasing prevalence of infectious disease is a great concern for healthcare

professionals and increasing awareness on the importance of HIV testing among individuals diagnosed with BPD to reduce or eliminate the spread of the HIV virus is needed for a healthier society. This study is highly significant due to a research gap that remains in literature.

Purpose of the Study

The purpose of this quantitative secondary analysis study was to explore the effects of the following predictors on HIV testing: having a bipolar diagnosis, high-risk behaviors, non-adherence to treatment for BPD, inability to afford treatment for BPD, and substance abuse other than alcohol and tobacco on the frequency of HIV testing. The study explored the following predictors: (a) having a bipolar diagnosis disorder; (b) high-risk behaviors that include sex exchanged for monetary gain, men having sex with other men, having sex with infected partners; (c) the inability to afford treatment such as prescription drugs, therapy, or counseling; (d) non-adherence to treatment for BPD; and (e) substance abuse other than alcohol and tobacco, and their relationship with obtaining an HIV test among individuals diagnosed with BPD. Furthermore, the study sought to determine whether demographics such as age, race, gender/sex, employment, marital status, and homelessness status were confounding factors of HIV testing among individuals diagnosed with BPD.

Research Questions and Hypotheses

The research questions and hypotheses of the study were generated from literature review on BPD and HIV testing research. Chapter 3 provided further discussions of the significance and nature of the study.

RQ1: Is having a bipolar diagnosis associated with having ever had an HIV test?

$H_0$1: Having a BPD diagnosis is not associated with having ever had an HIV test.

H_a1. Having a BPD is associated with having ever had an HIV test.

RQ2: Is participating in at least one high risk behaviors (including sex exchanged for monetary gain, men having sex with other men, having sex with an infected partner) associated with having ever had an HIV test among bipolar individuals?

$H_0$2: Participating in high-risk behaviors (defined as participating in at least one of the following activities sex exchange for monetary gain, men having sex other men, having sex with an infected partner) is not associated with having ever had an HIV test among bipolar individuals.

H_a2: Participating in high risk behaviors, defined as participating in at least one of the following: sex exchange for monetary gain, men having sex with other men, having sex with an infected partner is associated with having ever had an HIV test among bipolar individuals.

RQ3: Is an inability to afford treatment (including prescription drugs, therapy, and counseling for mental health care) associated with obtaining an HIV test among bipolar individuals?

$H_0$3: Inability to afford treatment (including prescription drugs, therapy, and counseling for mental health care) is not associated with obtaining an HIV test among bipolar individuals.

H_a3: Inability to afford treatment (including prescription drugs, therapy, and counseling for mental health care) is associated with obtaining an HIV test among bipolar individuals.

RQ4: Is non-adherence to treatment for BPD associated with obtaining an HIV test among bipolar individuals?

$H_0$4: Non-adherence to treatment for BPD is not associated with obtaining an HIV test among bipolar individuals.

H_a4--Non-adherence to treatment for BPD is associated with obtaining an HIV test among bipolar individuals.

RQ5: Is substance abuse other than alcohol or tobacco associated with obtaining an HIV test among bipolar individuals?

$H_0$5: Substance abuse other than alcohol or tobacco is not associated with obtaining an HIV test among bipolar individuals.

H_a5: Substance abuse other than alcohol or tobacco is associated with obtaining an HIV test among bipolar individuals.

RQ6: Are substance abuse, inability to afford treatment (including prescription drugs, therapy, and counseling), non-adherence to treatment, and high-risk behaviors potential factors associated with obtaining an HIV test among bipolar individuals?

$H_0$6: Substance abuse, inability to afford treatment (including prescription drugs, therapy, and counseling), non-adherence to treatment, and high risk behaviors are not potential factors associated with obtaining an HIV test among bipolar individuals.

H_a6: Substance abuse, inability to afford treatment (including prescription drugs, therapy, and counseling), non-adherence to treatment, and high risk behaviors are potential factors associated with obtaining an HIV test among bipolar individuals.

Theoretical Framework for the Study

The Epidemiologic Triangle or Epidemiological Triad is a traditional model that was created by the Centers of Disease Control and Prevention researchers to increase knowledge on health difficulties (CDC, 2009). CDC scientists have used this model in the past as a framework or method to prevent "communicable disease" (CDC, 2009; Russell, 2010; Nies & McEwen, 2007). The Epidemiologic Triangle framework allowed researchers to quantify relationship among variables. Epidemiologists have used the Epidemiologic Triangle in the past to explain possible associations between elements (agent, environment, and host) involved in the prevalence of infectious disease and mental illnesses (Kebede, 2004; Russell, 2010).

This framework is based on the idea that transmission of a disease occurs due to contact between the host and agent, as well as the host's predisposition to environmental factors (Russell, 2010). Analysis of the three factors enables researchers to assess the susceptibility of the condition that predisposes individuals to infection (Russell, 2010). The goal of the Epidemiological Triangle framework is to prevent diseases occurrence. The three steps include the following: (a) Primary Prevention (related to disease prevention), (b) Secondary Prevention (involves reducing the damage that occurs due to the disease), and (c) Tertiary Prevention (which deals with treating the affected individuals; CDC, 2009). In Russell's study (2010), the Epidemiological Triangle was

used to examine the relationship between “Methicillin Resistant Staphylococcus aureus (MRSA) transmission and hospital infections" (p. 3).

This theory has been used by researchers in past studies—mostly involving MRSA and nosocomial infections (Russell, 2010). The conceptual framework behind the theory is that the agent is referred as a virus that is present before the disease occurs. The agent’s presence is insufficient for the disease to happen. Thus, several factors are involved in the transmission.

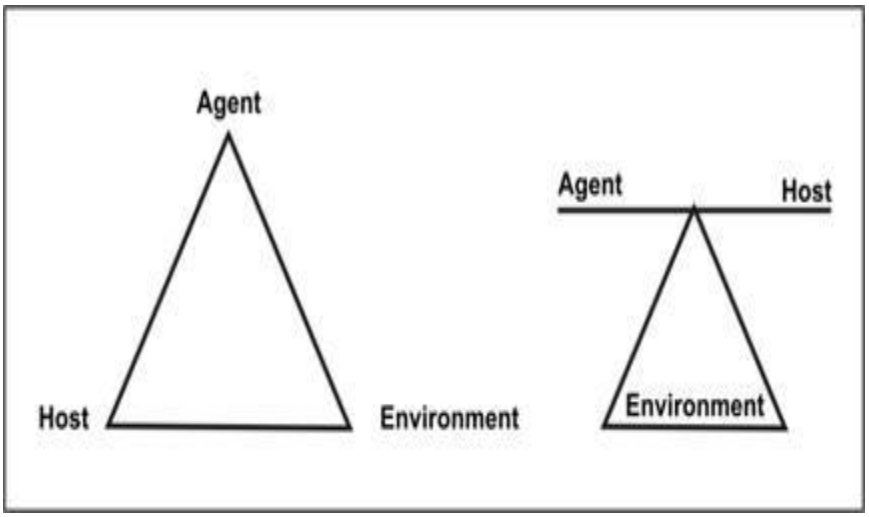

Figure 1. The Epidemiology Triangle or the EpidemiologyTriad. Adapted by the CDC (2009).

This framework was used in this study as a general guideline in understanding and analyzing the data from National Health Interview Survey (NHIS) conducted in 2007. In this study, the agent is HIV infection, the host is referred to as individuals diagnosed with BPD and at risk of acquiring the infectious disease (HIV), and the environment refers to external and demographic factors such as age, race, gender, marital status, employment, and homelessness (which can influence the host). Other environment

factors included access to health care, socioeconomic status, and high-risk behaviors that led to the spread of HIV. These circumstances are usually challenging factors that facilitate interaction between the host and the agent (CDC, 2009; Russell, 2010). Russell (2010) implied that time is another factor of the Epidemiology Triad because it is placed in the middle of the circle and is the "incubation period of the agent; the time between host infection and disease symptoms, and the duration of the illness or condition" (p. 6).

The Epidemiology Triad was used by CDC (2012) researchers to examine factors associated with HIV transmission, and they concluded that all three (agent, host, and environment) had to interact in order for transmission to occur. CDC (2012) suggested that in developing an effective preventive method to regulate transmission, public health professionals have to evaluate all three parts of the model and how they interact during the spreading of an infection. Royce, Sena, Cates, and Cohen (1997) used the Epidemiology Triad framework to examine HIV spread, and they suggested that the vulnerability of the host allowed the agent to transmit the infection, along with environment predisposing factors directly associated with HIV transmission (CDC, 2012).

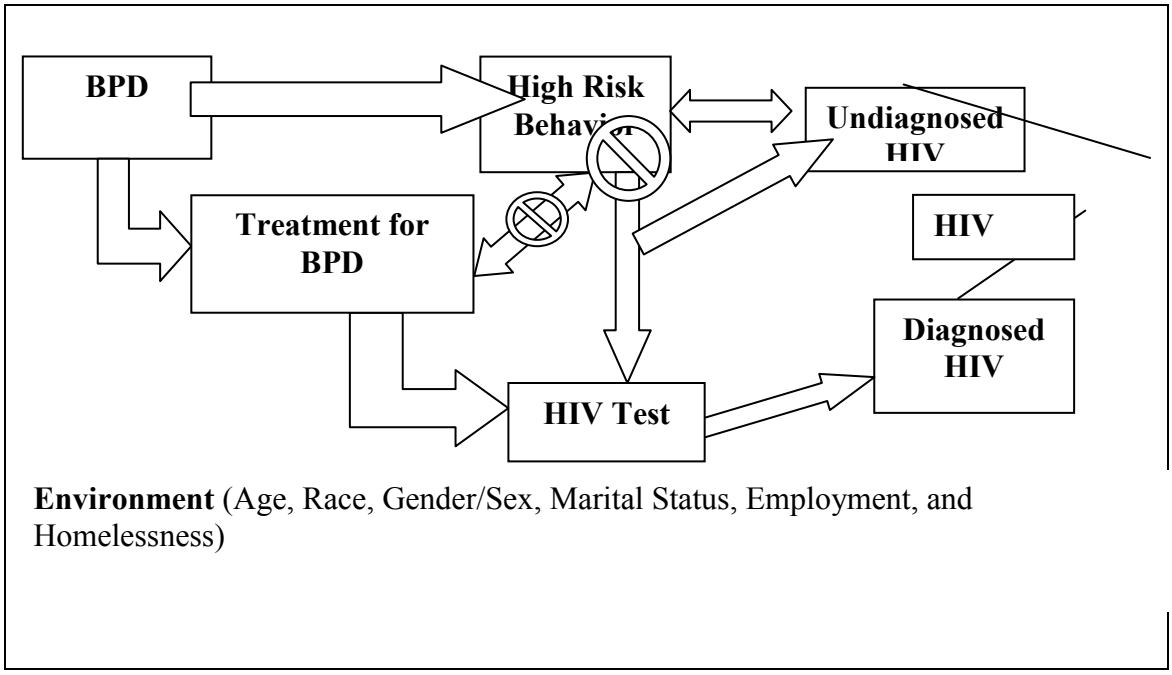

Figure 2. Conceptual model of HIV among people with BPD.

Figure 2 displays the conceptual framework for my study based on application of the Epidemiologic Triangle to explain the hypothesized association between HIV (agent), high-risk behavior (vector), and BPD treatment and HIV testing (host factors) among people with BPD (host). Additionally, age, race, gender/sex, marital status, employment, and homelessness comprised the "environmental" context within which the host lives. I used this model to determine the factors that might make bipolar individuals susceptible to HIV.

This study's objective was to examine the association between having a bipolar diagnosis, high-risk behaviors, inability to afford treatment, non-adherence to treatment, and substance abuse with obtaining an HIV test. Hence, the Epidemiological Triangle was the most appropriate framework for assessment. The agent was the HIV, and HIV

spread occurred due to a low rate of HIV testing among individuals diagnosed with BPD. The host was individuals diagnosed with BPD. Factors that could possibly be related to HIV spread were non-adherence to treatment, inability to afford treatment, high-risk behaviors, and low rate of HIV testing. The environment included factors such as age, race, gender/sex, employment, marital status, and homelessness. All these factors impacted the host susceptibility to HIV.

Numerous studies indicated that HIV infection prevalence was several times higher in mentally ill individuals than the overall population (McKinnon, Cournos, & Herman, 1997; Meade & Sikkema, 2005; Thompson et al., 1997; Volavka et al., 1991; WHO, 2012). Utilizing the Epidemiological Triangle framework and its concept would enhance awareness on the factors influencing interaction between agent, HIV; host, BPD people with HIV; and environment, age, race, gender/sex, marital status, employment, homelessness, and obtaining an HIV test.

Nature of the Study

A quantitative and cross-sectional design was used to explore the association between having a bipolar diagnosis and obtaining and HIV test, high-risk behaviors, inability to afford treatment, non-adherence to treatment, substance abuse, and HIV testing. I conducted a chi-square analysis to test the strength of the association between each of the independent variables and the dependent variable, obtaining an HIV test among bipolar individuals (Creswell, 2009). Using data from the National Health Interview Survey (NHIS) 2007, I performed the statistical analysis to measure the

association between the independent and the dependent variable. I adjusted for the following covariates: age, gender/sex, race, homelessness, employment, and marital status as potential confounders of the association between independent and dependent variables.

Definition of Terms

Bipolar Disorder or BPD: is defined as a serious illness that has historically been referred to as manic depressive disorder, manic depression, or bipolar affective disorder. The illness causes a shift in the individual's mood, as well as impairment in functioning level, and energy. Extreme manic episodes can lead to psychotic symptoms, such as delusions and hallucinations (APA, 1994).

High-risk behaviors: are referred to as behaviors that mentally ill people exhibit during a manic episode or mania such as irritability, hypersexual activity, anger, impulsive, mood swings, and racing thoughts (APA, 1994).

High-risk sexual behaviors: refer to engagement in sexual activities such as sex in exchange for money, or drugs, having unprotected sex, men having sex with other with men, and having sex with infected or multiple partners. All high sexual risk behaviors can facilitate HIV transmission among individuals engaging in these behaviors.

Inability to afford treatment: The patient has difficulty accessing treatment or pay for medications prescribed by their physician. Therefore, the individuals decide to discontinue treatment, which can include missing their doctors' appointments, not refilling their prescriptions, and avoiding any contact with their treatment team. In this situation, the action can be either voluntary or involuntary (Berk et al., 2010).

Non-adherence to treatment: is defined as being non-compliant to treatment protocols such as prescriptions, counseling, rehab, or therapy as prescribed by the physicians. This behavior can be the result of not having the means to access or, follow-up with treatment, as well as the belief that treatment is not needed or necessary. This behavior can result in relapse and multiple hospitalizations in order to address the illness.

Substance Abuse: "is a maladaptive pattern of substance use manifested by recurrent and significant adverse consequences related to the repeated use of substances" (APA, 1994, p. 178). According to the National Survey on Drug Use and Health (NSDUH) report, substance abuse can be diagnosed as a disorder (substance dependence or abuse) and involves illicit drug use. Examples of illicit drugs include the following: "marijuana, crack, inhalants, hallucinogens, heroin, methamphetamine, or prescribed drugs" (Substance Abuse and Mental Health Services Administration [SAMHSA], 2012, p. 245). Substance abuse can lead to functional impairment, such as work absenteeism and failure to commit to social and family obligations.

HIV testing: "is a cornerstone in efforts to detect, treat, and prevent HIV infection" (Desai et al., 2004, p. 2287). HIV testing is conducted through the use of ELISA and Western Blot to confirm the presence of antibodies to HIV. The test is performed through a blood sample for the diagnosis of infection. However, there are two current in-home tests available "OraQuick In-home HIV (provides rapid result within 20 minutes) and the Home Access HIV-1 Test System" (CDC, 2012, para. 2; although taking at home, the test has to be sent to a laboratory for result). Both tests are approved by the Food and Drug Administration (FDA) (CDC, 2012).

Homelessness: is a state in which individuals have an inability to afford rent and live on the street, therefore, relying on shelter agencies, friends, family members to provide shelter (Folsom et al., 2005).

Assumptions

This study used a secondary analysis of archived data collected via "computer-assisted personal interviewing (CAPI)" that permitted every participant to answer the questions from the computer screen. Collection of the data included self-reported measures, along with objective measures during the interview process. This study assumed that all study participants answered questions honestly without any fraudulent intent. It also assumed that their responses were precise and a representative of their insights, beliefs, feelings, and behaviors.

Scope and Delimitations

The scope of this study was to examine the association between the predictors' (having a bipolar diagnosis, high-risk behaviors, inability to afford treatment, non-adherence to treatment, substance abuse) and obtaining an HIV test among individuals diagnosed with BPD. Data were collected by CDC staff, and included individuals 18-years-old and above and thus limited to an adult population only. Determining why people diagnosed with BPD were not adhering to their treatment or having inability to afford treatment could not be answered due to limitations of the dataset. The gathered data were limited to bipolar individuals residing in the United States only. Examining why individuals did not adhere to their treatment was beyond the scope of this study. Additionally, the NHIS data collection used a household survey questionnaire and a

multifaceted sample design that involved stratified, clustered, and multistage sampling design for household members present during the interviews.

Limitations

The limitations of this secondary analysis included methodology and measurement utilization during data collection process. First, the NHIS 2007 sample was decreased by almost an half and a reduction of 13% in sample size due to budgetary purpose (CDC, 2008). A smaller sample size impacted the number of people available in the study, as well as the study findings. The sample might have included more bipolar individuals if the size was larger. Secondly, the gathered data were from a cross-sectional study design, and thus the results from this secondary data analysis might not supply authentication of causal association. Third, the data collection was based on household members present from all states during the interview process, in order to represent the United States. This was not a convenience sample but rather a complex multistage technique. The NHIS used a cross-sectional household interview survey and sampling involved a multistage area probability design.

This study restricted the sample to bipolar individuals only. In addition, the data analysis for non-adherence to bipolar, inability to afford treatment for BPD and HIV testing among bipolar people was based on self-report and was not objectively verified. To the extent that the answer given might be under-reported or over-reported for inability to afford treatment for BPD was difficult to establish. There was, then, no guarantee that the sample was representative of the whole BPD population in the United States, and individuals with BPD might not be entirely accurately represented. The results of this

secondary analysis might have generalizability problems due to the nature of the study being self-reported, which caused a lack of in-depth in the data. Additionally, the study sample might not be a true representative of the BPD population. However, the over-sampling technique utilized by the NHIS provided greater external validity and decreased standard error. In Chapter 3, I provide in-depth explanations about the study population and variables.

Significance

Researchers have noted that high-risk behaviors such as unprotected sex, sex exchanged for monetary gain, having sex with multiple or infected partners, and drug use are predictors of HIV transmission. Yet, little research has been completed regarding having a bipolar diagnosis, inability to afford treatment for BPD and non-adherence to treatment, and its possible relationship with obtaining an HIV test. This study was significant because it focused on this under-researched area. Many scientists indicated that ability to afford treatment and non-adhere to treatment for BPD decreased the frequency of manic episodes, decreasing engagement in associated high-risk behaviors (Michalak et al., 2011; Perlick et al., 2001). The findings of this study provided evidence on association between the aforementioned variables and HIV testing. This was a significant step toward understanding the enormity of HIV spread among BPD individuals. Possible positive social change would be increasing the body of knowledge necessary to improve education among bipolar individuals on the impact of high-risk behaviors, non-adherence to treatment for BPD and its consequences, and having a better

understanding of HIV testing for improving quality of life among people with BPD and others in society.

Summary

In this chapter, I provided a summary and framework for this secondary data analysis. The short examination on BPD and high-risk behaviors among both males and females with BPD indicated that there is an association between the predictors and the illness, yet a gap still remained in research regarding having a bipolar diagnosis, inability to afford treatment that caused non- adherence to treatment for BPD, and obtaining an HIV test among those with the disorder. Therefore, this research intended to fill this gap.

In Chapter 2, I provided an exhaustive literature review on high-risk behaviors and other studies related to the secondary analysis. Chapter 2 also included literature associated with mental illness, inability to afford treatment, non- adherence to treatment for BPD, and obtaining and HIV testing among individuals diagnosed with BPD.

Chapter 2: Literature Review

Introduction

Due to the complexity of BPD (being a brain disorder), people who have the illness undergo mood changes that lead to manic episodes. The patient, therefore, becomes impulsive and is apt to engage in high-risk activities including sex with several known or unknown partners, unprotected sex, prostitution, heavy drinking, and exchange of sex for monetary gain, drug usage, injection, and needle paraphernalia sharing (APA, 1994; Brown et al., 2009; Hariri et al., 2011; Loue et al., 2011; Malow et al., 2006; Martinowich, Schloesser, & Manji, 2009) When this situation occurred, the people involved were at high-risk of getting infected with HIV or other sexual transmitted diseases (STDs). This type of hypersexual activity has been seen in both males and females (Hariri et al., 2011). Non-adherence to treatment remained a problem among individuals diagnosed with Bipolar as it resulted in high-risk behavior, which led to HIV infection (Gaudiano et al., 2008). Ample research has been conducted in the past on mental illness and HIV; however, there is a lack of research on BPD and HIV. While HIV testing decreases the spread of the virus, research on HIV testing among individuals diagnosed with BPD is limited.

This literature review chapter includes a thorough review of pertinent literature related to high risk-behavior, treatment adherence, and HIV testing among bipolar individuals. Additionally, potential factors such as age, gender/sex, race, employment, marital status, and homelessness were reviewed to explain their role in HIV testing among people BPD.

I summarize the literature on mental illness, bipolar illness, mental illness and HIV, BPD and HIV, non-adherence to treatment, inability to afford treatment for BPD, having a BPD, high risk behaviors such as sex exchanged for monetary gain, men having sex with other men, having sex with an infected partner, substance abuse other than alcohol or tobacco, and their association with obtaining an HIV among individuals diagnosed with BPD. Additionally, potential factors such as age, gender/sex, race, employment, marital status, and homelessness status were reviewed to explain their role in HIV testing among BPD individuals. I complete the review with a discussion of methodologies used in previous studies, summary of the literature review, and transition to Chapter 3.

Literature Search Strategy

The literature search was conducted using several search engines and internet databases including Academic Search Premier, PsycINFO, PsyARTICLES, and Psychology: A SAGE Full-Text Collection, PubMed, Google Scholar, Nursing and Allied Health Source, CINAHL & MEDLINE Simultaneous Search, and MEDLINE with Full Text. These databases were accessed through EBSCO Host research database at Walden University Library. Additional searches were conducted through the CDC, WHO, and selected published textbooks by Creswell (2009). The DSM-IV was used to acquire relevant information on the topic being studied.

The keywords used to conduct the search included: *mental health, mental illness, BPD, access to mental health care, HIV rate among people diagnosed with BPD, HIV testing, substance abuse, high-risk behaviors, sexual risk behaviors, high-risk sexual*

behaviors, drug use, adherence/non-adherence to bipolar treatment, access to the testing site for HIV, gender role and bipolar, social status, employment, marital status, genetic, age, race/ethnicity, level of education, and *homelessness status.* Then the search was limited to articles that characterized the research results of high-risk behaviors, adherence/non-adherence to treatment for bipolar, and HIV testing among individuals diagnosed with BPD. The study search covers the period of 1988-2012. These years were selected to provide a better understanding on the impact of HIV/AIDS among mentally ill individuals, specifically those with BPD.

Theoretical Framework

The Epidemiologic Triangle or Epidemiological Triad is a traditional model that was created by CDC researchers to increase knowledge on health difficulties. CDC scientists have used this model in the past as a framework or method to prevent "communicable disease" (CDC, 2009; Russell, 2010; Nies &McEwen, 2007; Royce, Sena, Cates, & Cohen, 1997). The Epidemiologic Triangle has been used by epidemiologists in past research to explain possible associations between elements (agent, environment, and host) involved in the prevalence of infectious disease and mental illnesses (CDC, 2012, Kebede; 2004; Russell, 2010).

The Epidemiological Triangle allowed researchers to quantify the relationship among BPD, high-risk behaviors, inability to afford treatment, non-adherence to treatment, and the rate of HIV testing. This framework was used in this study as a general guideline for analyzing the variables presented above. This framework is based on the idea that transmission of a disease occurs due to contact between the host and agent, and

the host's predisposition to environmental factors (Russell, 2010). Analysis of the three factors facilitated researchers to assess the susceptibility of the condition that predisposed individuals to infection (CDC, 2012: Russell, 2010). For instance, in Russell's study (2010), the Epidemiological Triangle was used to examine the relationship between "Methicillin Resistant Staphylococcus aureus (MRSA) transmission and hospital infections" (p. 3). According to Russell (2010), this theory has been used by researchers in past studies mostly involving MRSA and nosocomial infections. This theory was selected because it provided the tools for studying infectious disease such as HIV, as past epidemiologists have noted above.

Within the conceptual framework of our study, the agent was referred to HIV. The agent's presence was not sufficient for the disease to happen; thus, several factors were involved in the transmission. The host was designated as individuals with BPD who had HIV, and the environment referred to external factors that influenced the agent. These factors were: age, race, gender/sex, employment, marital status, and homelessness, all of which caused the spread of the infection. These circumstances were usually challenging factors that facilitate interaction between the host and the agent (CDC, 2012; Royce et al., 1997; Russell, 2010). The goal of the Epidemiological Triangle framework is to prevent diseases occurrence, and it includes these three steps: primary prevention is related to disease prevention, secondary prevention involves in reducing the damage that occurs form the disease, and tertiary prevention concerns with treating the affected individuals (CDC, 2009, 2012).

Mental Illness

The World Health Organization (2008) defined mental health as the individual's ability to perform daily living tasks, function as a productive member of the community, and deal with stressful events. The DSM-IV described mental illness as disorders of the brain categorized as dysfunction of mood, thinking process, or behavior (APA, 1994). Mental illness has been viewed as an "economic burden" for the United States in which $300 billion was spent in 2002 for treatment (CDC, 2011). Classification of mental illness as included: Major Depressive Disorder, Anxiety Disorder, BPD, Schizophrenia/Schizoaffective Disorder, and others (CDC, 2011).

As reported by the National Institute of Mental Health (NIMH, 2008), mental illness was more prevalent among females than males (6% and 4%, respectively) in the United States. Mental illness was reported to be higher among people ages 18-25 and lower for ages 50 and above. Mental illness was also greater among European Americans (5.5%) than among American Indians (5.0%), Hispanics (4.5%), African Americans (3.5%), and Asian Americans (3%; NIMH, 2008). It was reported that mental illness affected 26.2% or 57.7 million of adults in United States. It comorbidity was 5-8% for people with two or more disorders, and 6.3% for those with three or more mental disorders (APA, 1994; Kessler, Chiu, Demler, & Walters, 2005). For the purpose of this study, the focus was on BPD and predictors related to HIV testing.

Bipolar Disorder

The prevalence of high-risk behavior among mentally ill people in the United States was highest of all other countries in the world mostly in the form of prostitution,

needle sharing, and injected drug utilization. Additionally, individuals diagnosed with BPD were also reported as taking part in high-risk sexual activities, including having several sex partners, unprotected sex, sex exchanged for money, and using drugs as a method of coping for relieving symptoms of depression (Marlow et al., 2006; Wainberg et al., 2008). Research also showed that individuals diagnosed with BPD (along with other psychiatric disorders) were sexually abused in their childhood (Wainberg et al., 2008).

Several studies revealed that during manic episodes were occasioned by non-adherence to treatment for BPD, the patient became impulsive and engaged in behaviors such as high-risk behaviors such as sexual activities with several known or unknown partners, unprotected sexual intercourse with homosexuals or bisexuals, prostitution, heavy drinking, and sex exchanged for monetary gain, drug usage, injection and needle sharing (Brown et al. 2009; Hariri et al., 2011; Loue et al., 2011; Malow et al., 2006; Martinowich et al., 2009). Impulsiveness led to poor judgment in making decision relative to well-being or healthiness; thus, the individual engaged in high risk behaviors without any thought of later consequences. Occurrence of the situation caused bipolar individuals to be at high risk of being infected with HIV due to lack of testing for the virus. This type of hypersexual activity was seen in both males and females (Hariri et al., 2011).

Research reported that adherence to medications for BPD decreased the frequency of manic episodes that encouraged engagement in high-risk behaviors (Michalak et al., 2011; Perlick et al., 2001). Additionally, it was reported that fear of stigmatization had

prevented people from being tested for HIV, and this stigma contributed to the spread of HIV (Herek, Capitanio, & Widaman, 2001).

BPD was reported by The National Comorbidity Study to have a lifespan prevalence of almost 4% and a lifetime comorbidity related with other Axis I disorders, mainly Anxiety Disorder (CDC, 2011). For all insured people with health care behavior coverage, past year claim amount was 7.5%, and BPD accounted for 3.0 %. Annually, people with BPD suffered a loss of $568 from out-of-pocket spending, higher rate of 39.1% from hospitalization, and treatment cost were reported to be twofold comparing to major depression and other mental illnesses (CDC, 2011). Due to manic symptoms, people diagnosed with BPD were shown to have a greater number of absentee days from work, and were less productive than those with other mental health disorders (CDC, 2011).

The prevalence of high-risk behavior among mentally ill people in the United States was highest of all other countries in the world mostly in the form of prostitution, needle sharing, and injected drug utilization. However, research showed that a large number of individuals diagnosed with BPD (along with other psychiatric disorders) were engaged in high-risk sexual activities and were sexually abused in their childhood (Wainberg et al., 2008). The BPD population was also reported as taking part in high-risk sexual activities, including having several sex partners, unprotected sex, sex exchanged for money, and using drugs as a method of coping for relieving symptoms of depression (Marlow et al., 2006; Wainberg et al., 2008).

Treatment for BPD has been proven to be effective in BPD recovery processes (Sajatovic et al., 2007). Having access to treatment facilities and the ability to purchase prescriptions were reported to be associated with improved functioning among individuals diagnosed with BPD (Sajatovic et al., 2007). Adherence to bipolar treatment (such as prescribed drugs, counseling, therapy, and psychosocial rehab) was reported to enhance recovery and prevent relapse, hospitalization, and drug use as a coping method for symptoms of BPD (Baldessarini et al., 2008; Basco & Smith, 2009; Sajatovic et al., 2007). BPD individuals who adhered to their medications were reported to be productive members of their communities (Baldessarini et al., 2008; Basco & Smith, 2009; Cruz et al., 2011; Sajatovic et al., 2007). Non-adherence to bipolar treatment could be intentional or unintentional (Berk et al., 2010).

HIV/AIDS in United States

The CDC reported that about 1.2 million people in the United States are HIV positive, and 1 in 5 people are not aware of their infection (CDC, 2011). Gay, bisexual, and males having sexual intercourse with other males (MSM), as well as young African Americans males, were also at higher risk of being infected with HIV (CDC, 2012). As noted by CDC, almost 1,148,200 people of 13 year of age and above have HIV, and about 207,600, or 18.1%, did not have knowledge of their HIV status (CDC, 2012). For the past 10 years, the rate of HIV has augmented; although the yearly amount of new HIV cases continue to stabilize (CDC, 2012). Recently, the incidence rate of HIV has stabilized to nearly 50,000 affected yearly (CDC, 2012). In the United States, some

groups were more at risk than others of being affected with the virus. The most affected individuals are the MSM, regardless of racial or ethnic background (CDC, 2012).

From 2008-2010, HIV increased among homosexual males at a rate of 52-78% from 2009-2010 (CDC, 2012). The second at risk groups were the drug users with a rate of 25-27% from 2009-2010. Substance abusers who mostly used drug injection had an HIV rate of 8-16 %, 85,000 of them were diagnosed with AIDS, and about 182,000 died since the epidemic started (CDC, 2012). A third group affected by HIV/AIDS was the Hispanic population, with a rate of 19-21% cases of HIV, and 96,200 died since AIDS started. In the United States, the concentration of HIV and AIDS was found mostly in the bigger cities with larger populations (CDC, 2012).

HIV and Mental Illness

The WHO highlighted that the incidence of HIV infection among severely mentally ill individuals was several times higher (5% and 23%, compared with a range of 0.3% to 0.4%) than the overall population (WHO, 2008). One of the first studies published on the prevalence of HIV among mentally ill people was conducted by (Cournos et al., 1991a). As reported by Cournos et al. (1991a), a female in-patient of the state psychiatric hospital in Brooklyn, New York was found to be the first mentally ill person diagnosed with AIDS in 1983. Many studies were later conducted to examine the prevalence of the HIV among mentally ill people, and the results indicated that the prevalence of HIV ranged from 4.0% to 22.9% among psychiatric patients (Cournos et al., 1991a; Empfield et al.,1993; Lee et al., 1992; Meyer et al., 1993; Sacks, Dermatis, Looser-Ott, & Perry, 1992a; Silberstein, Galenter, Marmor, Lifshutz, & Krasinski, 1994).

These studies were investigated through surveys in hospitals with a population of mentally ill inpatients. However, there were limitations including having small sample sizes that could not be representative of the United States population, geographic problems (due to New York City being the only site of research), small HIV testing rate, and inconclusiveness associated with reliability and validity of the research results (Cournos & McKinnon, 1997). According to epidemiological studies conducted in the United States the country was estimated to have an HIV "seroprevalence" rate of 4%-23% among people with mental illness (Malow et al., 2006).

In contrast to previous studies, the New York State Department of Health (1992) reported that the prevalence of HIV in men without mental illness in New York City was higher than women. The New York State Department of Health (NYSDH) also reported that drug injection was associated with HIV spread among the majority of females (New York State Department of Health, 1992). Carey, Carey, and Kalichman (1997) argued that research surveys reported that males and females with mental illness from countries like Brazil, Canada, and Spain had a higher risk of being infected with HIV due to high-risk sexual behaviors. Mentally ill patients have limited physical and emotional support, networking, and socialization. They therefore engage in high-risk behaviors to compensate for their deficiencies (Cournos et al., 1991b). Furthermore, past studies revealed that age was not related with HIV in psychiatric patients (Empfield et al., 1993; Silberstein et al., 1994) while Cournos et al. (1991a) and Silberstein (1994) suggested that minorities had a higher rate of HIV than White, and mentally ill females and males

were equally infected with HIV 5.3-20.0% for women and 3.8-24.0% for men (Cournos et al., 1991; Volavka et al, 1991).

Bipolar and HIV

Most studies conducted in the past mainly focused on mental illness and HIV (Cournos et al., 1991a; 1991b), and little research was done regarding HIV and BPD (Rosenberg et al., 2001). Rosenberg et al. (2001) did a study to examine the rate of HIV among mentally ill people. The study included 931 in-and out-patients from psychiatric hospitals with mental illnesses, and 16.8 of them had BPD (Rosenberg et al., 2001). Their results revealed that HIV was "8 times higher in mentally ill people than all other U.S. population" (Rosenberg et al., 2001, p. 31). The factors associated with the high rate of HIV among mentally ill people were high-risk behaviors that included unprotected sex, sex exchanged for money, drug use, and sharing of paraphernalia (Carey et al., 1997; Cournos et al., 1991a; Empfield et al., 1993; Lee et al., 1992; Meyer et al., 1993; Rosenberg et al., 2001; Sacks et al., 1992a; Silberstein et al., 1994). Because BPD was referred to in the past as manic depressive disorder or manic depression, some of the past studies related to BPD, high-risk behaviors, and HIV were mainly referred to as manic depressive studies.

The rate of HIV was shown to be highly significant among bipolar, or manic depressive. Individuals who engaged in high-risk behaviors, had lack of HIV testing rate, and did not adhere to bipolar treatment (APA, 1994; Carey et al., 1997; Desai & Rosenheck, 2004; Himelhoch et al., 2011; Lopez-Jaramillo et al., 2010; Marlow et al. 2006; McKinnon et al., 2002; Meade & Sikkema, 2005a; Melo et al., 2010; Thompson et

al., 1997). According to Melo et al. (2010), HIV was more prevalent among people diagnosed with BPD due to high-risk behaviors. Additionally, it was reported that young depressed females with low self-esteem, low-income individuals, and drug users were the more at risk due high-risk behaviors (Collins, von Unger, & Armbrister, 2008;Collins, Sweetland & Zybert, 2007; Michalak et al., 2011).

Mental Illness and HIV Testing

Past research on mental illness and HIV were mostly conducted within psychiatric hospital Wards, and HIV testing was not emphasized during experimental studies (Cournos & McKinnon, 1997; Cournos et al., 1991). These studies revealed the difficulties that existed in promoting HIV testing among mentally ill people due to their asymptomatic signs of HIV. Testing frequency to detect HIV infection depends on the resources available within the facilities. So far, none of the studies were conclusive about mental illness as a predictor of HIV; however, BPD was reported to be associated with high-risk behaviors (Cournos et al., 1991; Volavka et al., 1991). Marlow et al. (2006) noted that HIV testing rate was about 4-23% among people with mental illness.

Multiple explanations were associated with HIV testing among mentally ill people. They included having curiosity of their HIV status, having medical issues, pregnancy, and having past suicidal attempts by overdosing on medications or repeated infectious diseases (Thompson et al., 1997). In the meantime, another study noted that people who were not mentally ill were tested due to having insurance coverage, pregnancy, being hospitalized, or workplace requirements (Blumberg & Dickey, 2003). CDC initiated a campaign to increase preventive programs highlighting HIV testing as a

significant element. The purpose of the program was to bring awareness among 70-90% of the U.S. population with HIV by the year of 2005 (CDC, 2003a). Meade and Sikkema (2005) noted that mental ill individuals lack knowledge of HIV testing, with support from past studies that indicating that 84% of homeless males were never been tested for HIV (Levounis, Galanter, Dermatis, Hamowy, & DeLeon, 2002).

In 1997, Cournos and McKinnon conducted a study to examine the prevalence rate of HIV among mentally ill individuals, and their findings indicated that the HIV ranged from 4-23% among mentally ill people. However, Rosenberg et al. (2001) argued that sampling continued to be a concern in studies regarding HIV and mental illnesses. The results revealed that 3.1% of mentally ill participants of the study were HIV positive, which is lower than the 8% previously reported among the total United States population. Many factors (including high-risk behaviors such as unprotected sex, drug injection, substance abuse, prostitution, and homelessness) were reported to be associated with high prevalence of infection. Ethnicity was not significant, but age was linked with a higher rate of HIV (more prevalent among the younger people). There was no significant difference among people of different marriage status or income level; however, rates were higher among males than females (Rosenberg et al., 2001).

Meade and Sikkema (2005) led a study with the aim of verifying the occurrence of HIV testing amongst mentally ill people who received treatment for their illnesses. Their sample included 150 people: 69 females and 81 males with an age range of 20-63 years. It was a longitudinal study, involving follow-up between the years (2003-2004). High-risk behaviors were examined, as well as age, race, ethnicity, income and education level,

marital status, social support, homelessness, diagnosis, and HIV testing rate. Multivariate analysis using logistic regression was conducted to evaluate HIV testing within the year. Their findings showed that over 80% of the subjects had never been tested for HIV, and 21-41% had tested once, twice, and five times. The factors associated with the occurrence of testing were demographics, psychiatric diagnosis, substance abuse, and socioeconomic status (Meade & Sikkema, 2005).

High-Risk Behaviors and Mental illness

As noted by Melo et al. (2010), individuals with mental illness such as BPD were reported to be indulged in high-risk sexual behavior, which led to their infection. The study was conducted in Brazilian hospitals (15) and mental health-based clinics (11). It utilized survey questionnaires to examine the level of understanding of disease associated with high-risk sexual behavior. Their results indicated that individuals with psychiatric disorders did not fully understand the consequences of high-risk behavior and HIV transmission (Melo et al., 2010). Most mentally ill individuals were abused at one point of their lives, suffer depression, and engage in unsafe sexual activities. Sexual abuse has also been reported to be associated with high-risk sexual behaviors and HIV spread in previously published literature (Marlow et al., 2006). In the study by Marlow et al (2006), common high-risk sexual behavior patterns were seen in mentally ill individuals who had a history of sexual abuse, for both men and women. In addition, substance abuse was found to be related to a history of sexual abuse. The study explained that most patients with mental illnesses had been sexually abused in the past, and the sexual abuse was

positively associated with the occurrence of mental illness symptoms. Those individuals were also found to be more likely infected with HIV (Marlow et al., 2006).

Marlow et al. (2006) indicated that they were the first to conduct a study to examine possible association between these predictors and HIV spread among individuals diagnosed with BPD and other mental disorder. Their findings demonstrated that psychiatric participants who had experienced a history of sexual abuse, about 43% of them practiced high-risk sexual activities, were drug users, and had HIV (Marlow et al., 2006). Additionally, mentally ill individuals were mostly from minority ethnic background (African American, Hispanic, Cuban, Latinos, and Puerto Rican), and the majority of the participants had BPD or a, drug addiction (marijuana, cocaine, and crack). As suggested by Collins, von Unger, and Armbrister (2008), predictors associated with high-risk sexual behavior among psychiatric people were low self-esteem, stigma related to being mentally ill, economic status, drug use, and gender. The more stigmatized the depressed females were, the more often they engaged in unsafe practice—including sex with several partners, prostitution, and drug use—putting them at risk for HIV infection (Collins et al., 2008; Collins et al., 2007; Michalak et al., 2011). In the Brazilian study, mentally ill people were also found to engage in unsafe sexual behaviors due to "relationship discrimination" from perceived stigmatization (Elkington et al., 2010). The stigmatization that occurred among bipolar and other people with mental illness disorders was suggested to be associated with an increased rate of HIV infection and detrimental to their wellbeing (Elkington et al., 2010).

Bipolar Disorder and High-Risk Behaviors

Numerous studies were conducted to assess the association of high-risk behaviors among individuals with BPD and the prevalence of HIV infection. These studies indicated that individuals with BPD had a tendency of being impulsive, which predisposed them to engaging in high-risk behaviors—such as unprotected sexual intercourse with unknown partners, exchange of sex for monetary gain, substance use, injection and needle sharing behaviors that have increased their risk of acquiring HIV (Hutton et al., 2004; Rosenberg et al., 2001). Carey et al. (2004) conducted a study to assess the impact of psychiatric disorder (such as bipolar or mood disorder, substance abuse disorder) and gender on high-risk behaviors. The study included 430 patients who received services from the psychiatric hospital. Their results indicated that people with BPD were more at risk of acquiring HIV due to high-risk behavior patterns that occurred among this group. However, another study by Beyer, Taylor, Gersing and Krishnan (2007) showed that HIV was more prevalent among drug users than individuals with BPD with a rate of 5% and 2.6% (Beyer et al., 2007).

Hariri et al. (2011) highlighted that a lack of awareness of HIV transmission was one of the factors responsible for high-risk sexual behaviors among individuals with BPD in Turkey. In comparison with other mental illnesses, bipolar individuals were more likely to engage in unprotected sexual activities during the manic phase than those with other mental disorder groups (Hariri et al., 2011). In the study conducted in Brazil by Melo et al. (2010), understanding of HIV risk was negatively associated with sexual intercourse with multiple partners among psychiatric patients; however, individuals with

BPD had more knowledge of HIV risk than individuals with Schizophrenia. Therefore, the conclusion was that lack of information or perception of possible threat associated with high-risk behavior and HIV among mentally ill people was associated with HIV infection spread (Melo et al., 2010; Wainberg et al., 2008).

The highest percentage of mentally ill individuals taking part in high-risk sexual behavior was found in the United States, most frequently prostitution, needle-sharing, and injected drug utilization (Wainberg et al., 2008). The same study also found that individuals who had BPD (along with other psychiatric disorders) were often sexually abused in their childhood. This population was also reported having a high-risk sexual activities that consisted of having several sex partners, unprotected sex, exchanged of sex for money, and using the drug as a coping method to relieve their depression (Marlow et al., 2006; Wainberg et al., 2008).

Griffin and Weiss (2008) did a study on sexual risks pattern behaviors among bipolar individuals and those with substance abuse disorders to determine the relationship of HIV rate among the group. The study involved 101 subjects who had BPD or drug abuse disorders. Their findings suggested that 75% of participants engaged in high-risk behavior (69% unprotected sex, 39% with several partners, 24% had sex with prostitutes, and 10% exchanged sex for money; Griffin & Weiss, 2008, p. 296). These behavior patterns were seen in bipolar individuals who were non-compliant with treatment regime provided by their physicians. Individuals with BPD experienced manic episodes, and the manic phase impaired their judgment, which led to impulsiveness. During the phase, these people engaged in high-risk sexual encounters, and high-risk behaviors were

reported to be associated with HIV infection among individuals with BPD (Meade et al., 2008; Brown et al., 2010).

Bipolar Disorder and Substance Abuse

One of the objectives of a study done by Meade et al. (2008) was to assess the relationship between the use of certain drugs and high-risk sexual behavior among bipolar individuals. Multivariate linear regression was used to test the association, and the findings indicated that individuals with BPD people addicted to cocaine showed significant risk of sex exchanged for money. The need for the drug was more important than protection against infection. By not having any money to satisfy their desire, BPD individuals engaged in trading sex for monetary gain. Similar sexual risk behaviors were shown among individuals with BPD in the study conducted by Meade et al. (2011). They reported that illegal substance use had increased the rate of HIV by three times among individuals with BPD. It was also shown from a "chart review of over 11,000 psychiatric outpatients at Duke University Medical Center, the HIV prevalence among BPD patients without and with co-occurring substance abuse was 2.6 and 9.1%" (Meade et al., 2010, p. 1830). Additionally, 50% of patients with BPD were drug users, and drug usage was proven to be a predictor for HIV infection spread (Meade et al., 2010).

Marlow et al. (2006) examined 134 psychiatric patients with past sexual and physical abuse to determine the rate of substance use among these patients. Their findings showed that 127 were substance users at some point in their lives (106 alcohol, 99 marijuana, 101 cocaine, 90 crack cocaine, 22 amphetamines, and 25 heroin (Marlow et al., 2006, p. 130). When assessed for substance use in the past month, over 41% were

reported to drink alcohol, 33% alcohol intoxication, 17% had used cannabis, 13% cocaine, 27% crack cocaine, 0.8 % amphetamines, and 4%, heroin (Marlow et al., 2006, p. 130). Similarly, in a study conducted by Loue et al. (2011), findings indicated that having a past history and current usage of substance had increased the rate of HIV among Mexican Women. These women were reported to use substances to cope with mental illness symptoms (Loue et al., 2011). However, Puerto Rican females were found to have a higher rate of substance abuse in the study. Among the 31 study participants with BPD, 45.2 % were current users, while 13.6% had used substances in the past (Loue et al., 2011).

Bipolar Disorder and Treatment Adherence

Adherence to treatment was defined as a process where individuals agreed and make effort to participate in their treatment as prescribed by their treatment team, and were able to afford treatment (Berk & Castle, 2004; Berk et al., 2010). Plan of care was achieved through a partnership between the treatment team and the patient receiving care. When patients agreed to follow treatment regimen prescribed by their physicians, they engaged in the plan of care, and trust the treatment team who provided the services needed to enhance their functional abilities. Therefore, the patients attended scheduled appointments made by their treatment team and agreed to take and refill their medications as prescribed by their physicians voluntarily (Berk & Castle, 2004; Berk et al., 2010; Piterman, Jones, & Castle, 2010).

Bipolar Disorder, Non-Adherence to Treatment, and Inability to Afford Treatment

Non-adherence or inability to afford treatment included not prescription drugs, therapy, and/or counseling, were usually either "voluntary or involuntary" (Berk et al., 2010). The patients decided whether to discontinue their treatment deliberately—missing their doctors' appointments, not refilling their prescriptions, or avoiding any contact with their treatment team, which was a voluntary act. Involuntary non-adherence to treatment occurred for several reasons, or inadvertently, and included giving up without realizing the consequences of the action taken. Non-adherence usually happened due to medications side effects, prolonged time in taking the same medications, forgetfulness during frequent manic episodes, and inability to afford therapy treatment or monthly drug prescriptions. Many patients began to use a different method of coping (strategies for dealing with their illnesses) unintentionally, which many times involved utilizing drugs and alcohol. This type of behavior was linked mostly to individuals with BPD (Baldessarini et al., 2008; Basco & Smith, 2009; Berk & Castle, 2004; Berk et al., 2010; Colom & Vieta, 2002; Gaudiano et al., 2008; Sajatovic, Chen, Dines, & Shirley, 2007).

Many factors including genetics, environmental, substance use, and stress were associated with the incidence of BPD (APA, 1994). Symptoms related with the manic phase included irritability, argumentativeness, and impulsiveness, engaging in high-risk behaviors, flight of ideas, "mood swings," and high/low or happiness/sadness moments. During the manic or depressive episodes, BPD individuals were usually hyper and did not adhere to treatment regimen prescribed by their physicians. Although, BPD has no cure,

the illness can be treated through adherence to bipolar treatment and psychosocial rehab (APA, 1994).

Past studies noted that adherence to treatment was multifaceted and challenging among bipolar individuals, and influenced by several factors—such as inability to afford treatment and social demographics (Aagaard et al., 1988; Aagaard &Vestergaard, 1990; Colom & Vieta, 2002). Non-adherence to bipolar treatment caused relapse, functional impairments, hospitalizations, and drug use, which prevented individuals from being productive members of their communities (Baldessarini et al., 2008; Basco & Smith, 2009; Sajatovic et al., 2007). Several studies indicated that BPD affected the individual's relationship with "neurocognitive" family (meaningful family ties) and friends, as well as economic status due to disability (Baldessarini et al., 2008; Elinson, Houck, & Pincus, 2007; Thomas et al., 2008). According to Baldessarini et al. (2008), BPD was found to be linked with "high levels of long-term morbidity, comorbidity, hospitalization, disability, increase in mortality rates resulting from suicide accidents, and adverse outcomes of comorbid substance use and medical illnesses" (p. 95). Therefore, awareness of the severity of BPD, and the importance of treatment adherence for the illness should be increased in order to prevent reoccurrence of crisis situations.

Many predictors were associated with non-adherence to treatment and inability to afford treatment among individuals with BPD, including: age, race, ethnicity, marital status, gender, culture, level of education, income level, substance abuse, manic episodes, stigma related with mental illnesses, lack of knowledge of the severity of the illness, lack of natural and emotional support, side effects of medications, denial of diagnosis,

homelessness, financial cost, and access to healthcare services (Baldessarini et al., 2008; Basco et al., 2009; Elinson et al., 2007; Lopez-Jaramillo et al., 2010; Peuskens et al., 2007; Sajatovic et al., 2007; Strakowski et al., 2007). Sajatovic et al. (2007) conducted a study to examine differences among medications adherence in veterans with BPD, depending on whether they were under or over 60 years of age. It was a large study that involved 73,964 participants with BPD. Descriptive statistics were used to analyze the data, multiple logistic models to compare age group (young/old), and Wilcoxon Test to control covariates and significance of various antipsychotic medications between the groups. Interestingly, their findings indicated that the older group (23.5%) showed more medications adherence than the younger ones (76.5%; Sajatovic et al., 2007). The older individuals who adhered to their medications tended to be white, married, and have a higher income level. The BPD group, meanwhile, consisted mostly of minorities, substance users, homeless, single/widowed/never being married and divorced individuals. The study had limitations, including observation of medication refill that was not necessarily related with treatment adherence, utilization of gender sample that included veteran males only, and setting limitation (Sajatovic et al., 2007).

Another study was conducted by Strakowski et al. (2007) intending to compare the prevalence of BPD in Cincinnati, Ohio of United States and Taiwan. It involved having a "diagnosis of BPD I, first manic episode or mixed at index evaluation" (Strakowski et al., 2007, p. 821). Similar, to previous studies, factors like age, sex, marital status, employment, education level, and homelessness were assessed to determine association. The study was conducted at the University of Cincinnati from

June 1996 through-October 2003. In Taipei however, the study began on December 1999-April 2004. The sample from United States was made up 96 individuals and Taipei had 46 individuals. Surprisingly, the findings suggested that the American BPD-diagnosed individuals had a lower-employment rate, more relapse and shorter hospitalizations, concurring depressive moods, non-adherence to treatment, and greater substance abuse rate than the participants from Taipei (Strakowski et al., 2007).

People with BPD in China mostly resided with family, had longer rates of hospitalizations, lower substance abuse, had better access to health care services (national health coverage), higher level of income and employment rate, and higher rate of treatment adherence (Strakowski et al., 2007). The results, however, indicated that people with BPD in both China and America showed similarity in age, marital status, and the rate of occurrence in manic and psychotic episodes (Strakowski et al., 2007). The identified limitations of the study were linguistic problems from translation (English/Chinese) and no recruitment of epidemiological sample from both United States and Taiwan (Strakowski et al., 2007). Berk et al. (2010) noted that gender association with treatment adherence among individuals with BPD was inconclusive due to conflict shown in the results from their meta-analysis. However, significant association was found for predictors like age, race, ethnicity, marital status, homelessness, and substance use. The older and married individuals with BPD people were more adherent to their treatment, while the younger individuals with BPD were mostly non-adherent to their treatment, substance users, non-married, unemployed, and homeless (Berk et al., 2010; Sajatovic et al., 2007).

There has been conflicting evidence regarding age and treatment adherence among individuals with BPD. For instance, Sajatovic et al. (2007) reported that older individuals with BPD showed adherence to medications, but their study was limited to BPD veterans only. Busby and Sajatovic (2010) conducted a meta-analysis that included 22 published articles, and the findings indicated that older individuals with BPD had higher medications adherence than the younger ones. However, in the discussion section, Busby and Sajatovic (2010) pointed out that there were limitations in the study's analysis, and deemed that the results were inconclusive.

Cruz et al. (2011) conducted a study in Brazil to confirm adherence of treatment among people diagnosed with BPD as previously reported by other researchers. A cross-sectional, descriptive mixed method was used for data analysis. Factors included being 60 and above, having a BPD diagnosis, receiving medication at the mental health clinic, and having scheduled appointments in a 90 day period. Survey questionnaires were used to assess whether noncompliance was voluntary or not. Among the 17 people who participated in the study, over 75% were women with low education, married, and unemployed due to their disability. The authors noted that there was no significant association to gender in the prevalence of BPD in the Brazilian population, but at this particular clinic, more women agreed to receive services for their illness. The findings indicated that most participants were not adherent to their treatment due to lack of understanding of their illness, as well as treatment benefits (Cruz et al., 2011). The outcome of this study contradicted previous studies that showed higher medications

adherence among older BPD individuals with BPD (Berk et al., 2010; Sajatovic et al., 2007).

Sajatovic et al. (2007) indicated that most individuals with BPD lack understanding about the severity of their illness, as well as, the benefit of the treatment regimen prescribed by their physicians. According to the author, enhancing "psychoeducational interventions" (planning or developing strategies to educate individuals with BPD of the benefit of medication adherence; p. 181) increased medication adherence. Providing education about the individuals' illness and benefit of long-term treatment enabled them to make an informed decision on their treatment outcomes. In addition to previous factors related to non-adherence to treatment for BPD among individuals with BPD, a lack of knowledge of the "severity of comorbid conditions" (Sajatovic et al., 2007, p. 185) of the illness, and unpleasant side effects played a greater role in non-adherence to treatment among this population. People diagnosed with BPD and their families should be informed about their diagnosis, reasons associated with their illness, treatment available and psychosocial skills to manage their illness and improve their functioning. Awareness of "psychoeductional approaches" increased the individuals' performance, motivation, and social skills for becoming productive members of their communities (Baldessarini et al., 2008; Busby & Sajatovic, 2010; Cruz et al., 2011; Lopez-Jaramillo et al., 2010; Perlick et al., 2004; Sajatovic et al., 2007; Smith et al., 2011; Smith et al., 2008;).

Multiple studies suggested that BPD affected individuals globally (Busby & Sajatovic, 2010; Cruz et al., 2011; Sajatovic et al., 2007). Cruz et al. (2011) noted that

non-adherence to treatment for BPD was 20-60% for all BPD individuals. Non-adherence to treatment and inability to afford treatment was also associated with high mortality rate from suicide among individuals with BPD. Cruz et al. (2011) argued that non-adherence to medications was the cause of many re-hospitalizations, cognitive impairments, substance abuse, and suicidal attempts. Smith et al. (2008) highlighted that developing strategies to increase adherence to treatment for BPD disorder should be fundamental. However, implementation of the programs is challenging due to resource limitations. Non-adherence to treatment for BPD and inability to afford treatment was been suggested to be problematic, and managing the illness through treatment regimen was much more difficult (Basco & Smith, 2009).

Adherence to treatment for BPD was shown to reduce risk factors that caused relapse, re-hospitalization and mental health crisis situations (Smith et al., 2008). Treatment adherence also decreased mortality that occurred from suicides and attempts from overdose, substance use, and accidents due to high-risk behaviors (Basco & Smith, 2009; Cruz et al., 2011). Adherence to BPD treatment allowed individuals to live more productive lives and increased their functional ability (Baldessarini et al., 2008; Berk et al., 2004, 2010). As stated by Sajatovic et al. (2007), predictors that influenced treatment adherence among BPD individuals were complicated; however, increasing "psychoeducation" among this population would increase access to mental health services (Baldessarini et al., 2008; Busby & Sajatovic, 2010; Cruz et al., 2011; Lopez-Jaramillo et al., 2010; Perlick et al., 2004; Sajatovic et al., 2007; Smith et al., 2008, 2011). Legislators and designers of policy should be encouraged to enact laws and

enforce policies aimed at increasing educational outreach in order to eliminate the financial barriers preventing treatment adherence for bipolar individuals.

Bipolar Disorder and Gender Differences

BPD as defined by the APA (1994) remained a severe mental illness that affected both men and women at an equal rate. Substance-use was also reported as being associated with high-risk sexual behavior in a Brazilian study conducted by Elkington et al. (2010). Their findings indicated that among male participants (49%), 27.6% had BPD and 39.0% used drugs or alcohol before engaging in sexual intercourse (pp. 59-60). However, another study was conducted among BPD patients that included 61 participants (males=36, females=25) who were tested for substance use. The results showed that both genders used drugs (cocaine), alcohol, and cannabis equally. An increase of manic symptoms was reported to have an impact on high-risk sexual activities (Meade et al., 2011). The authors examined BPD individuals to assess possible factors associated with high-risk behaviors, and the results showed that the factors associated with high-risk sexual behavior among BPD substance users were: manic phase, time, depressive moods, and cocaine use. Depressive mood was not found to be associated with high-risk sexual behavior. On the other hand, every week the scale of cocaine use increased for manic individuals with BPD, with significant association to high-risk sexual behavior, including unsafe sex with several partners, sex exchanged, and prostitutions. Therefore, drug abuse was said to be a predictor of HIV spread among individuals with BPD due to high-risk sexual activities (Meade et al., 2011).

Grant et al. (2005) conducted a study using a secondary database from the CDC to examine the prevalence of substance use (mostly alcohol) among Bipolar I individuals. Their findings showed no significance of gender difference in BPD rate; however, period of mania (or manic episode) was higher in males than females. BPD was found to be associated with drug use, but not alcohol. They also concluded that people with BPD were often found to have personality disorders and/or anxiety, which increased the prevalence substance dependence (Grant et al., 2005). In a Brazilian study of 98 people (equally divided for men and women) BPD, was reported to be associated with substance use (Wainberg et al., 2008). The study also included other mental illnesses, however, among the participants, 27.6% had BPD, and 11.2% were substance users (marijuana, alcohol, benzodiazepines, and cocaine; Wainberg et al., 2008).

Loue et al. (2011) conducted a study on Hispanic females who had a mental illness diagnosis (including BPD). The results showed that females who used substances were more at risk for HIV infection than others, due to high-risk sexual behaviors (Brown et al., 2010). Predictors associated with greater risk for HIV infection among women with substance abuse history included: stigmatization related to mental illness, drugs or alcohol utilization before having sexual intercourse, having sex with several partners without prior knowledge of HIV risk status, and sex exchanged for monetary gain (prostitution; Collins et al., 2008). It was suggested that Hispanic women with BPD faced many disadvantages that increased their risk of being infected with HIV—such as psychological effects of being a minority, sociopolitical consequences of being an

immigrants, low income level, low self-concept, gender inferiority, stressed, and mental illness stigmatization (Collins et al., 2008; Loue et al., 2011).

Cournos and McKinnon (1997) indicated that no gender difference really existed in the rate of HIV from drug injection among mentally ill people. Both females and males were equally engaged in high-risk behaviors that involved substance use (Hariri et al., 2011; Meade et al., 2011). BPD females with AIDS were reported to be more often engaged in drug injection than males in New York City (Cournos & McKinnon, 1997). Conversely, alcohol was found to be the major substance used among both males and females with a history of abuse and mental illness (Marlow et al., 2006). Grant et al. (2005) also argued that BPD was significantly associated with substance use without any gender difference (Brown et al., 2010). This study results supported previous studies that showed no gender differences in substance use among BPD individuals. Additionally, Grant et al. (2005) argued that the prevalence of BPD was not associated with gender (Elkington et al., 2010).

Bipolar and Age

The onset of BPD generally occurs between the ages of 15-25. BPD includes two types: Bipolar I (manic) and Bipolar II (depressive) (APA, 1994). High-risk behavior patterns were not only shown in adults, but in adolescents with BPD. Nigerian teenagers were examined by Bakare et al. (2009) for substance use and manic symptoms associated with high-risk sexual behaviors. The study included 46 teenagers with BPD, who were followed in a longitudinal study for 12 months. The results indicated that 47.8% of the teenagers were cannabis and alcohol users with behavior problems. Among these

teenagers, 23.9% were shown to have "psychoactive substance used," 13% had HIV and 45% engaged in high-risk sexual behaviors from (Bakare et al., 2009). Furthermore, Bakare et al. (2009) suggested that further studies are needed among youth with BPD with "co-morbid disorders," impulsive, and engaged in high-risk sexual behaviors to prevent the spread of the HIV (Bakare et al., 2009). Again, there was no mention of the need for treatment adherence for BPD or HIV testing in any of the studies.

The HIV virus had a high prevalence rate among mentally ill individuals between the ages of 15-24 due to engagement in high-risk sexual behavior and substance use. Women were suggested to be at higher risk of being infected with HIV infection (Brown et al., 2010). In this study, all demographic characteristics (age, gender, education, income, homelessness) were measured to determine association. Their results revealed no association between these factors and substance use or high-risk sexual behaviors among the youth (Brown et al., 2010). Similarly to adults with BPD, these adolescents were reported to be engaged in high-risk behavior such as unsafe sex, sex exchanged for money, having sex several partners, needle sharing, and drug abuse. However, BPD was higher among the youth, Native American, unmarried, widowed, and low-income people (Brown et al., 2010; Meade et al., 2011).

Bipolar Disorder and Employment

As discussed above, not having or having a low income played an important role in high-risk behavior among bipolar people. Elinson et al (2007) conducted a study of 1,855 individuals with BPD who received treatment in order to assess the factors related to employment rate and having disability benefits. Methodology involved a comparison

of social status, demographics, treatment adherence, and insurance coverage. The results showed that 49.4 % of the sample was young, white, employed, had higher education and income, resided with family/friends, mostly married, had a low rate of relapse and suicidal attempts, low percentage of manic episodes, and infrequent hospitalization. The remaining 50% of BPD groups were either unemployed or receiving social security benefits (Elinson et al., 2007). Collins et al. (2006) argued that low-income and unemployment was predictors associated with BPD.

Piterman et al. (2010) argued that BPD is the "sixth leading" factor related to disability, and most people with BPD relied on social security and unemployment benefits to take care of themselves and their love ones. Their study reported that people with BPD had a low or no income, difficulty with securing housing, and were often estranged from family members who could provide financial assistance (Baldessarini et al., 2008; Ellinson et al., 2007; Piterman et al., 2010; Thomas et al., 2008). As research documented, BPD prevented many people from being fully functioning or productive members of their communities (Berk et al., 2010). However, higher-income levels were found among older individuals with BPD (Sajatovic et al., 2007). The study's results also suggested that American citizens who had BPD had a lower income rates compared to those who resided in Taipei (Sajatovic et al., 2007). On the other hand, income level did not prove to be significant in a study conducted by Rosenberg et al. (2001).

Bipolar Disorder and Race

Among minorities, Asians and Latinos had a lower rate of BPD in comparison to White and African American individuals (Grant et al., 2005). Elkington et al. (2010)

conducted a study with mostly white males, and found that 27.6% of the participants had BPD. A total of 92% of the participants reported engaging in high-risk sexual activities that included (unprotected sex, drug and alcohol use, having sex with several partners, and sex trading). The results also indicated that among participants, 16% were black, 45% white, and 37% identified as being of multiple races (Elkington et al., 2010). In the Sajatovic et al. (2007) study, younger individuals with BPD people were found to be minorities, had low or no income and low education.

In contrast, Chinese people diagnosed with BPD were reported to be more productive and had a stronger network and family support (2007). Berk et al. (2010) noted that race and ethnicity was significantly linked to BPD. Furthermore, the Ellinson et al. (2007) study indicated that white participants with BPD compare to other study participants had a higher function level and higher rate of employment. In Rosenberg et al. (2001), race and ethnicity showed no difference because all BPD participants were engaged in high-risk sexual behavior.

Bipolar Disorder and Marital Status

Among the participants of the Elkington study (2010), 71% unmarried, 13% married, and 14% divorced/separated/widowed individuals reporting being engaged in high-risk sexual activities. Ellinson et al. (2007) indicated that people diagnosed with BPD were more often married. Significant association was also found to be a predictor for higher functioning level in married people with BPD (Berk et al., 2010). However, Rosenberg et al. (2001) study reported a significant association between marital status and high-risk behavior among individuals with BPD. As documented by other research,

unmarried individuals diagnosed with BPD were at risk of getting HIV due to high-risk sexual behaviors (Hariri et al., 2011; Brown et al., 2009; Loue et al., 2011; Malow et al., 2006; Martinowich et al., 2009).

Bipolar Disorder and Homelessness

Homelessness was reported at 15% among people diagnosed with BPD. Men of African descent had a greater rate of homelessness than other ethnic men, due to higher drug use, lack of insurance coverage, and functional impairment. Meanwhile, Hispanics and Asian men had a lower rate of homelessness (Folsom et al., 2005). The above study was conducted in San Diego County, with the purpose of examining factors related to homelessness among BPD individuals and other mental illnesses. When comparing racial backgrounds among bipolar individuals who engaged in high-risk sexual behavior and substance use, African American males were more at risk to be homeless than other male minorities (Folsom et al., 2005). A limitation of this study was that predictors like education, income, and marital status were excluded in the logistic regression analysis, which could have been important in determining association with homelessness (Folsom et al., 2005).

Bipolar Disorder and HIV Testing

According to Desai and Rosenheck (2004), HIV testing was viewed by health care providers as a means for combating the spread of HIV. Many factors were associated with low HIV testing among citizens worldwide. They included age, race/ethnicity, marital status, income and education level, psychiatric symptoms, and homelessness. However, the most at-risk group was mentally ill individuals. Desai and

Rosenheck (2004) noted that being tested for HIV was important, yet coming back for the test result was the most significant step an individual could make towards HIV prevention. Anxiety from acquiring AIDS or having an acquaintance dying of AIDS was a key motivator to HIV testing. Additionally, mentally ill people frequently engaged in high-risk behaviors and, therefore, were higher risk of HIV infection (Thompson et al., 1997).

As previously mentioned, people with mental illnesses (mostly those with BPD) engaged in high-risk behaviors, and these risks were shown to have tremendous effect in their life. Past researches indicated that 54-75% mentally ill individuals were highly engaged in high-risk sexual behaviors (Carey et al. 1997; Meade & Sikkema, 2005a). Senn and Carey (2009) stated that 46% of individuals diagnosed with BPD engaged in high-risk behavior reported having been tested for HIV in the past year, 18% were predicted to be tested for HIV in the following year (Blumberg & Dickey, 2003; Senn & Carey, 2009).

The meta-analysis study conducted by Senn and Carey (2009) revealed that age, race, ethnicity, and education level were not related with HIV testing among individuals with BPD or other mental illnesses. Conversely, Meade and Sikkema (2005) reported that age, ethnicity, race, marital status, income and education level, and homelessness were linked with low testing rate of HIV. Treatment Adherence among psychiatric patients was related to a higher rate of HIV testing. People who were highly supported by family and friends, or had frequent relapses and hospitalizations showed a high proportion of HIV testing during the course of their illnesses (Desai et al., 2007; Melo et al., 2010;

Meade & Sikkema, 2005; Senn & Carey, 2009; Thompson et al., 1997). Thompson et al. (1997) noted that people with BPD had a lower rate of HIV testing, than those with schizophrenia.

Desai et al. (2007), meanwhile, indicated that the difference in HIV testing among mentally ill individuals was related to having fewer psychiatric symptoms. Lower rate of HIV testing was reported among females with schizoaffective disorder (which meant that the individual experiences both bipolar and psychosis symptoms). When income and education level was adjusted as covariates to determine whether higher education made a difference in gender behavior, the results indicated that HIV testing rate was lower among females than males. The belief was that higher education did not influence the women's attitude toward getting tested for HIV (Senn & Carey, 2009). Carey and Kalichman (1997) noted that past study results were inconclusive regarding gender association and HIV testing rate; therefore, further research should be conducted to determine whether association.

Nevertheless, findings were consistent regarding the association of race, age, homelessness, testing history, income and education level, and marital status to HIV testing among mentally ill individuals. Younger mentally ill individuals were shown to engage in high-risk behaviors, rarely test for HIV, and had less concern about the spread of infection. On the other hand, older people with mental illnesses were more likely to get tested for HIV and follow-up with testing results. Testing history was associated with a high level of HIV testing rate, in that having being tested in the past increased the possibility of being tested again in the future (Desai et al., 2007; Himelhoch et al., 2011;

Meade & Sikkema, 2005; McKinnon et al., 2002; Melo et al., 2010; Senn & Carey, 2009; Thompson et al., 1997).

Interestingly, Meade and Sikkema (2005) showed that having a strong social support, higher education and income level, and marriage increased the rate of HIV testing, while homelessness was seen as a factor that reduced HIV testing. The rationale was that mentally ill homeless people without income and low education had a higher risk of substance abuse and repeated high-risk sexual behavior. Therefore, this population was less likely to be tested for HIV. However, homelessness (which was common among psychiatric patients), was associated with a higher rate of HIV testing. This study's results were supported by evidenced of self-report from individuals who received assistance from shelter programs that promoted HIV testing once room and board was provided. Mentally ill people specifically those with BPD more often engaged in high-risk behaviors, and were less likely to get tested for HIV (Meade & Sikkema, 2005).

In the Brazilian study led by Melo et al. (2010), it was reported that globally people with mental illnesses were ill-informed about HIV risk factors. Among the 2,475 study participants interviewed, only 27% had been tested for HIV within the past year. The idea of increasing education regarding HIV risk factors and HIV testing was supported by Meade and Sikkema (2005) in their concluding statement, due to a large number of their study participants who reported having no history of HIV testing (though they were at risk of being infected with HIV infection; Himelhoch et al., 2011, Melo et al., 2010).

Research Methodologies

Generally, high-risk behaviors and adherence/non-adherence to treatment for mental illnesses were the focus of research in the past, as shown in the literature review. Quantitative methods (such as survey questionnaires) provided objective tools through a systematic approach. Additionally, quantitative methods allowed researchers to replicate previous studies conducted by others based on a well- organized methodological approach. If this type of study continued in different settings among a different population, the results would probably be the same (Creswell, 2009).

Creswell (2009) suggested that utilization of surveys allowed researchers to quantify an individual's attitudes and behaviors, numerically. The technique involved included selecting a sample through randomization of the specified population being studied. Quantitative research methods as noted by Creswell (2009) facilitated in-depth data analysis through the utilization of statistical methods. This specific research method enabled researchers to establish an association among variables of interest. Several researchers used quantitative methods to examine the relationship of high-risk behaviors and rate of HIV among individuals diagnosed with BPD. The results of these studies indicated that significant associations existed between high-risk sexual risk behaviors and HIV spread among individuals with BPD, and other mental illnesses (Carey et al., 1997; Desai & Rosenheck, 2004; Himelhoch et al., 2011; McKinnon et al., 2002; Meade & Sikkema, 2005a; Melo et al., 2010; Thompson et al., 1997). Thus, a quantitative design was the most appropriate method to fit this study purpose.

The cross-sectional approach was conducted through observation at one point of a time. The data were generated without any manipulation of the participants, setting, or study. The distinctive characteristic of cross-sectional research is that a group comparison from a diverse population can be performed at one time (Creswell, 2009). For instance, in the study conducted by Melo et al. (2010), cross-sectional methodology was used to compare diverse groups from multiple settings. Many variables, such as age, gender, homelessness, symptoms frequency, marital status, race and ethnicity, and income and educational level were compared at one point of a time to determine the association among the variables. However, the limitation of the study was a lack of knowledge on whether age or gender was the cause of low rate of HIV testing among Brazilians, as cross-sectional studies occurred at one point of a time, and not included the opportunity for future follow-up (as in a longitudinal study; Creswell, 2009; Melo et al., 2010).

In Meade and Sikkema (2005), observations were conducted over a year-long period. Unlike the cross-sectional approach, longitudinal methodology was used to determine the relationship among the variables (economic status, psychiatric symptoms, social support, and HIV testing) among people who had or not being engaged in high-risk behaviors. Meade and Sikkema were able to demonstrate that a relationship existed among high-risk sexual behaviors and HIV. They also reported that psychiatric symptoms were related to an increase of HIV testing rate.

Examination of the association between HIV testing and factors was performed through “hierarchical logistic regression” (Meade and Sikkema, 2005, p. 468) over a one-year period. Among participants, bipolar individuals accounted for 27%, and the

remainder was made up of individuals with other mental illnesses. The findings showed that most study subjects with a mental illness had never been tested for HIV, compare to over 20% of "no-risk" individuals who had an HIV testing history (Meade & Sikkema, 2005).

A large proportion of the literature reviewed, indicated that some form of quantitative design was used to conduct studies on BPD and HIV testing. The most cited studies were Cournos and McKinnon (1997) and Carey et al. (1997a). The findings were mostly inconclusive regarding the association of age, gender, race/ethnicity, and income and education level to HIV testing, due to limitations in setting and environment. Nonetheless, significant association was found between high-risk behaviors (such as drug use, drug injection, sex exchanged for monetary gain, unprotected sex, and sex with multiple or unknown partners) and HIV transmission. Interestingly, most mentally ill people with higher engagement in high-risk sexual activities had never been tested for HIV infection (Desai et al., 2007; Himelhoch et al., 2011; McKinnon et al., 2002; Meade & Sikkema, 2005; Melo et al., 2010; Senn & Carey, 2009; Thompson et al., 1997). Meade and Sikkema (2005) conducted a bivariate analysis among the 150 participants of their study to determine the relationship between mentally ill people and obtaining an HIV test. A multivariate analysis was also conducted to test association between "high risk behaviors, demographic such as age, gender, education, income level, social support, and homelessness" (Meade & Sikkema, 2005, p. 468). The results indicated that substance abuse, high-risk behavior, age, gender, income level, and education were related to rate of HIV testing (Meade & Sikkema, 2005; Rosenberg et al., 2001). Both

bivariate and multivariate analysis was appropriated for testing the rate of HIV test in this study.

Overall, many researchers investigated mental illness, and most findings reported a significant relationship between high-risk behavior and BPD. However, a gap still remained in research regarding the relationship between treatment adherence for BPD and HIV testing among individuals with the disorder. Therefore, a cross-sectional design was used to explore the relationship between inability to afford treatment, non-adherence to treatment for bipolar, high-risk behaviors (such as drug use, unprotected sex, and needle sharing) and HIV testing by utilizing the NHIS 2007 dataset. A cross- sectional approach was the best fitted for this study because it allowed the researcher to perform group comparison from different variables at one point in time (Creswell, 2009).

Summary

Chapter 2 included a review of the literature on mental illness, BPD, HIV/AIDS in the U.S., inability to afford treatment, treatment adherence and non- adherence to treatment, high-risk behaviors, and the association of different predictors to BPD and HIV testing. Also addressed was an explanation of manic or depressive symptoms that increased high-risk behaviors, non-adherence to medications, and HIV testing among individuals with BPD individuals.

The research gap this study hoped to fill was the absence of studies focused singularly on BPD, rather than individuals with mental illness as a whole. BPD affects 5.7 million American adults, or about 4% of the population (APA, 1994; CDC, 2011; WHO, 2008). Only a handful studies addressed high-risk behavior, treatment

adherence/non adherence, and inability to afford treatment in bipolar individuals. Several studies revealed that the HIV rate remained excessively high among mentally ill people, due to high-risk sexual behaviors, drug injection, sharing of needles, and a low rate (less than 50%) of all mentally ill people tested for HIV (Desai & Rosenheck, 2004; McKinnon et al., 2002; Meade & Sikkema, 2005a, 2005b, 2007; Meade & Weiss, 2007; Rosenberg et al., 2001; Senn & Carey, 2008). This study was highly significant in bringing awareness of the benefit of adherence to treatment for individuals with BPD, increasing knowledge about HIV testing, and decreasing HIV spread among individuals with BPD. Chapter 3 includes a detailed discussion of the proposed research design and methodology.

Chapter 3: Research Method

Introduction

The purpose of this study was to explore the relationship between a set of predictors (a) having a bipolar diagnosis, (b) high-risk behaviors that involved: sex exchanged for monetary gain, men having sex with other men, having sex with an infected partner, (c) substance abuse (drugs other than alcohol and tobacco), (d) inability to afford treatment such as prescription, therapy, and counseling, (e) non-adherence to treatment for bipolar, and (f) all independent variables combined into a model (having a BPD, high-risk behaviors, substance abuse, inability to afford treatment, and non-adherence to treatment for BPD and the outcome variable of HIV testing).

Furthermore, the study sought to determine whether demographic such as age, gender/sex, marital status, race, employment, and homelessness were confounding factors for HIV testing among individuals diagnosed with BPD. I provided the research design, the type of instruments used, and the process for scoring and interpretation. Validity and reliability of assessment were reviewed. I also discussed the data collection technique and analysis approach. Additionally, explanation of ethical considerations to protect participants' rights was provided.

Research Design and Rationale

For this study, I utilized a quantitative cross-sectional design to determine whether predictors such as having a bipolar diagnosis, high-risk behaviors (including sex exchanged, men having sex with other men, sex with an infected partner), non-adherence to treatment for bipolar, inability to afford treatment, and substance were related to HIV

testing. I conducted a Chi-square analysis to test the strength of a possible association between having a bipolar diagnosis and the outcome variable of HIV testing. I conducted a Chi-square and binary logistic regressions analysis to test the strength of a possible association between inability to afford treatment such as (prescriptions, therapy or counseling) and the outcome variable of HIV testing.

I conducted a Chi-Square, a binary logistic regression, and a bivariate analysis to test the strength of a possible association between non-adherence to treatment for BPD and the outcome variable, HIV testing. I performed a bivariate and multiple logistic regressions test for the independent binomial variables high risk behaviors (sex exchanged, men having sex with other men, having sex with an infected partner) and their association with the outcome variable, HIV testing.

I also conducted analyses using hierarchical multiple logistic regressions to test the binomial independent variables having a bipolar diagnosis, substance abuse other than alcohol or tobacco (street drug), non-adherence to treatment for BPD, inability to afford treatment, and high-risk behaviors to determine whether they were predictors of obtaining an HIV test among individuals diagnosed with BPD. All five independent variables were entered as a model to determine if they were predictors of HIV as a whole. In this study, the dependent or outcome variable was HIV testing.

I ran multiple logistic regressions to assess and adjust for the covariates age, gender, race, marital status, employment, and homelessness as potential confounders of the association between the independent and dependent variables. However, causality was not proven using this approach because cross-sectional design did not allow causal

relationship. Secondary data from NHIS 2007 was used to examine possible association between the independent and dependent variables.

Even though this cross-sectional, correlational research design had limitations, this design was selected as the best approach for analyzing the NHIS 2007 data. Additionally, for answering the research questions that aimed at assessing whether the combination of having a bipolar diagnosis, high risk behaviors, inability to afford treatment, non-adherence to treatment, and substance abuse were predictors of HIV testing among BPD individuals. The NHIS database has been used in past studies related to mental illnesses issues such as high-risk behaviors, medication adherence for BPD, and HIV testing to explore the relationship among variables (Adekeye, Heiman, Onyeabor, & Hyacinth, 2012).

The NHIS is a component of the National Health and Nutrition Examination Survey (NHANES) that involves gathering data through survey questionnaires. The results allowed researchers to follow health status through health questionnaires (CDC, 2009). The NHIS was noted as a sizeable continuing project that collected data through the means of computer based, questionnaires, and data assessment from households within the nation that were selected to represent the population of United States (CDC, 2009). Quantitative survey research designs were used in the past for research studies involving large sample with great number of participants (Grant et al., 2005).

Due to the nature of data being an archived dataset, the data was carefully examined to reduce potential bias already involved in using secondary data. The strength of utilizing archived data included reliability, validity, time endeavor, and cost-

effectiveness. The weakness of the study involved conducting survey questionnaires that rely on self-reported information for data collection, which was subjective. Secondly, I did not have any control over procedures used to ask questions when the study was conducted. However, researchers used the NHIS dataset before, and it was proven reliable (Grant et al., 2005).

Population

I used secondary data from the NHIS 2007 to conduct this research study. The NHIS study population included all civilian non-institutionalized population of 18 years and older (18-84) of the United States. The participants of the study were both male and female adults living in United States households. The Census Bureau Regional Offices employed 600 employees to conduct the interviews. These employees were chosen through exams and testing and received annual training on techniques for conducting interviews from NHIS experts in the field. They were called "Field Representatives" (FRs; CDC, 2009).

The study included "29,266 households, which generated 75,764 people in 29,915 families" (CDC, 2009, p. 11). The number was reduced to 23,393 participants excluding adults who were unable to answer the survey questionnaire from ages 18 and above (18-84). Among the 23,393 people enrolled in the study, 387 reported having BPD. Inclusion and exclusion followed the procedures used by the Census Bureau during data collection in Table 1.

Table 1

Breakdown of the Family Members Participating in the Survey

Number of Members	Frequency	Percent
1	8,849	29.6
2	9,032	30.2
3	4,622	15.5
4	4,132	13.8
5	2,034	6.8
6	778	2.6
7	270	0.9
8	124	0.4
9	36	0.1
10	22	0.1
11	8	0.0
12	4	0.0
13	1	0.0
14	2	0.0
16	1	0.0

Table 1 displays family size (un-weighted counts) and is considered to vary during breakdown. It also shows a breakdown of the 29,915 families by number of family

members (NHIS, 2007). The population study included all racial background summarized in Table 2 from the NHIS 2007 data file (CDC, 2007).

Table 2

2007 NHIS Race/Ethnicity Variable Names and Description

2007 Variable Name	Description
ORIGIN_I	Hispanic origin/ancestry with imputed values for some records
ORIGIMPT	Hispanic origin imputation flag
HISPAN_I	Type of Hispanic origin/ancestry with imputed values for some records
HISPIMPT	Type of Hispanic origin imputation flag
RACERPI2	Contains 4 of 5 OMB race groups; values imputed for some records. Does not include "Other race" category.
MRACRPI2	Detailed race variable; multiple race persons not selecting a primary race group in separate category. Values were imputed for some records. Does not include "Other race" category.
MRACBPI2	See section below on bridging; values were imputed for some records. "Other race" category included for bridging purposes.
RACRECI3	Variable that contains 4 race categories used in post-stratification and weighting. New category added to reflect changes in sample design. Values imputed for some records.
RACEIMP2	Imputation flag for use in determining which cases were imputed for the race variables. New categories added to account for new editing procedures.
HISCODI3	Same categories as RACRECI3, crossed with ORIGIN_I (Hispanic/non-Hispanic); values were imputed for some records.
ERIMPFLG	Summary race/ethnicity imputation flag – indicates that either race or ethnicity or both race and ethnicity were imputed.

Sample and Sampling Procedures

The procedure used by the NHIS in gathering the sample is presented below in. They divided the number of people interviewed over the total number of people who were eligible to participate in the survey:

(Interviewed Sample Adults) / (Eligible Sample Adults)

The final sample was calculated by "response rate" from:

(Interviewed Sample Adults) / (Eligible Sample Adults from Interviewed Families) x (Final Family Response Rate).

Table 3

Response rates for 2007 NHIS

File	Eligible	Interviewed
Household	33,615	29,266
Family/Person	30,081	29,915

Source: Centers for Disease Control and Prevention, 2009.

Table 3 shows family response rate among the 33,615 eligible to participate in the survey. Only 29,266 were interviewed. As stated by Census Bureau experts sample size had to be reduced due to budget cuts since 2006 (CDC, 2009).

The NHIS 2007 utilized a stratified probability sampling technique to gather health data from the non-institutionalized population of the United Stated. For the NHIS 2007 survey, 29,266 households were interviewed through substratification sampling technique. The sample size was reduced to 23,393 participants, in which 387 individuals were reported to have a BPD diagnosis (CDC, 2009).

Power Analysis

I utilized G*Power 3.1.7 to conduct the power analysis for proportion of HIV testing, using varying values of P2 for the proportion of mentally ill people who had an HIV test. To calculate the implied power, I used two-tailed test, alpha Type I error and 1-Beta, two proportions (p1 and p2), and odds ratio for adherence to treatment, and inability to afford treatment for BPD. I calculated the effect sizes utilizing step 1 for a small effect size P2 = 0.37; P1 = 0.41; odds ratio = 4; N1 = 23006; N2 = 387; Power = 0.52, and alpha = .011. For a medium effect P2 = 0.3; P1 = 0.37; ratio = 4; N1 = 23006; N2 = 387; Power = 0.81, and alpha = 0.46. For a large effect P2 = 0.23; P1 = 0.37; ratio = 4; N1 = 23006; N2 = 387; Power = 0.99; and alpha = 0.0009. For this study, the medium effect of P2 = 0.30; P1 = 0.37; N2 = 387; Power = 0.81; alpha = 0.46, and a ratio = 4 was chosen because it provided almost 80% power for the proportion P2 = 0.30 of people with BPD who had an HIV test, as compared to the CDC (2012) which reported a percentage of 35.9% in 2011 and 34.7% for 2012 in all U.S. residents who had ever tested for HIV. However, the 2009 NHIS report indicated that 39.8% of the U.S. population was never tested for HIV (CDC, 2011). These numbers were close to Meade and Sikkema's study (2005), which showed that 41% of 152 mentally ill participants had an HIV test, while Desai and Rosenheck's study (2004) indicated that 38.0% of 5,890 mentally ill participants had an HIV test. When using Meade and Sikkema (2005) P1 = 0.41to calculate implied power, P2 of 0.37, and ratio = 4, the power was 0.52 and alpha = 0.11, this result indicated a small effect size that was not appropriated for this study. Utilization of the medium effect size followed Cohen's (1988) guidelines for the best

effect size of 0.20, which gave a power of 0.80. Therefore, anything less or more was not appropriated (small and large size effect) to examine the association for individuals diagnosed with BPD and HIV testing. The NHIS 2007 sample size of 387 was used as N2 and P2 of 0.30, alpha of 0.46, and a ratio of 4 was used in this study. I also conducted a Bonferroni correction post-hoc test to correct any Type I error during analyses of the study.

Instrumentation Operationalization of Constructs

The NHIS researchers used the instrument "computer-assisted personal interviewing" (CAPI) to conduct surveys, and it allowed every participant to answer questions from a computer screen. Guidance was provided from the device to the staff conducting the interviews according to participants' answers. The answers were then entered straight into the computer, and the CAPI program decided whether the chosen response could be allowed as a correct response in the answer range. During the interview process, assistance was available on-line for the investigator to administer the CAPI program questionnaire. This type of data collection technique (technology) allowed information to be transferred, processed, and released faster to ensure questionnaire accuracy (CDC, 2009). The NHIS used some instrument and variable terms to conduct their interviews and document their data. I used both the variable and instrument names to conduct the study analysis (See Appendix).

The instrument utilized by the NHIS for BPD was (BIPDIS). The BIPDIS was also used as variable name to document the data. The question asked was "have you ever been told by a doctor or other professional that you had BPD?" The choices given were

coded as 1= yes; 2= no; 7= refused; 8= not ascertained; and 9= don't know. For the purpose of this study, only the yes and no question was used, and all others such as refused, not ascertained, and don't know were excluded from the analysis. Having BPD was operationalized as a categorical variable with two categories for the purpose of this study.

The NHIS 2007 instrument and variable used to assess high-risk behavior was STMTRU. The technique utilized to gather data involved providing a list of statements to the participants—and all questions did not have to be true to process with their analysis, only one answer from the given statements had to be true. The question asked was "Tell me if ANY of these statements is true for YOU. DO NOT tell me WHICH statement or statements are true for you. Just IF ANY of them are: (a) You have hemophilia and have received clotting factor concentrations; (b) You are a man who has had sex with other men, even just one time; (c) You have taken street drugs by needle, even just one time; (d) You have traded sex for money or drugs, even just one time; (e) You have tested positive for HIV (the virus that causes AIDS); or (f) You have had sex (even just one time) with someone who would answer "yes" to any of these statements. For coding purposes, the question was reduced to: "are any of these statements true?" The answer choices were coded as 1=Yes, at least one statement is true; 2= No, none of these statements are true; 7= Refused; 8= Not ascertained; and 9= Don't know. To assess the relationship, the study analysis will include only the answer choices of yes and no and at least one statement is true. Additionally, exclusion included the first statement a = you

have hemophilia and had received clotting factor concentrations, and they refused, not ascertained, and don't know answers.

The instrument and variable name used for inability to afford treatment was AHCAFY_2. The question asked during data collection was "DURING THE PAST 12 MONTH, was there any time when you needed any of the following, but didn't get it because you couldn't afford it? Mental health care or counseling". The answer choices were as follows 1= yes; 2= no; = refused; 8= not ascertained; and 9= don't know. For the purpose of this study, only people who answered yes or no were included in the analysis. The answer choices of refused, not ascertained, and don't know was be excluded from the data analysis. Inability to afford treatment was operationalized as a categorical variable with two categories for the purpose of the study.

The instrument and variable name used for non-adherence to treatment was AHCSYR1. The question asked during data collection was "Seen/talked to a mental health professional in the past 12 month". The answer choices were as follows 1= yes; 2= no; 7= refused; 8= not ascertained; and 9= don't know. For the purpose of this study, only people who answered yes or no will be included in the analysis. The answer choices of refused, not ascertained, and don't know was excluded from the data analysis. Non-adherence to treatment was operationalized as a categorical variable with two categories for the purpose of the study.

The instrument and variable used for substance abuse was SUBABYR. The question asked during data collection for substance abuse was "DURING THE PAST 12 MONTHS, have you had substance abuse, other than alcohol or tobacco?" The answer

choices were coded as 1= yes; 2= no; 7=refused; 8= not ascertained; and 9= don't know. For the purpose of the study, only the yes and no response were included for substance abuse, and all other answers were excluded. Substance abuse was operationalized as a continuous variable for the purpose of the study.

To answer question number 6, I used the combined variables: BIPDIS, STMTRU, AHCAFY_2, AHCSYR1, and SUBABYR. All data coded as yes or no was included in the analysis, and the rest was excluded. All independent variables (having a diagnosis of bipolar, high-risk behaviors, inability to afford treatment, and non-adherence to treatment) were examined to determine if they were predictors of HIV testing among bipolar individuals. BIPDIS was operationalized as a categorical variable with two categories, while STMTRU, AHCAFY_2, AHCSYR1, and SUBABYR will be operationalized as continuous variables for the purpose of the study.

The instrument and variable used by the NHIS to assess HIV testing was HIVTST. The question was "Have you ever been tested for HIV, and the answer choices were 1= yes; 2= no; 7= refused; 8= not ascertained; and 9= don't know." Furthermore, the NHIS also utilized other instruments and variables, such as WHYTST_R, for the reason of not being tested for HIV, HIVTST12M_Y as the years of last test, TIMETST for the period of last test, and REATST_C for the cause of HIV test (CDC, 2009). The question asked was "Reason why you have not been tested for HIV/AIDS?" The answer choices were coded as followed 01= It's unlikely you've been exposed to HIV; 02=You were afraid to find out if you were HIV positive; 03= You didn't want to think about HIV or about being HIV positive; 04=You were worried your name would be reported to the

government if you tested positive; 05=You didn't know where to get tested; 06=You don't like needles; 07=You were afraid of losing job, insurance, housing, friends, family, if people knew you were positive for AIDS infection; 08=Some other reason; 09=No particular reason; 97=Refused; 98=Not ascertained; and 99= Don't know. For the purpose of this study, only the instrument and variable HIVTST was used, as the other variables were not important for assessing the dependent variable, obtaining an HIV test. All responses pertaining to HIV testing was used, and all other choices were excluded.

The data set also included the year of last test and time frame of 20 years and over, followed by more questions regarding the reason for the lapse in time for test. Time period was assessed for 6 months to 5 years, and the instrument and variable used was TST12M_M IN. Assessment of possible reasons people were tested for HIV followed this format: curiosity, possible exposure through drug use or sex, at work or other places, pregnancy, health reason or requirement, concern about transmission, or treatment option, and the instrument variable use was REATST (CDC, 2009).

In the study, I controlled and adjusted for demographic such as age, gender/sex, race, employment, marital status, and homelessness, which could be potential confounders of the association between the independent and dependent variables. The instrument and variable used to assess age was AGE_P. The answer choices were coded as Age 00 = under 1 year; 01-84 years = 1-84 years; 85= 85+ years. For the purpose of the study, only the answer 01-84 = 18-84 years was included in the analysis. Age was operationalized as a continuous variable for the purpose of the study.

The instrument and variable name used by the NHIS to assess gender was SEX. The question was as followed "Are/Is, you/person male or female." The answer choices were coded as 1= male; 2= female. Gender was operationalized as a categorical variable with two categories for the purpose of the study.

The NHIS used RACERPI2 as both instrument and variable name. The question was "OMB groups w/multiple race," and coded as 01= White only; 02= Black/African American only; 03= AIAN only; 04= Asian only; 05= Race group not releasable; and 06= Multiple race." All answer choices were included in the analysis. Race was operationalized as a categorical variable for the purpose of this study.

The instrument and variable used to assess marital status was MS1-MS25. The question was "Are/Is, you/person, now married, widowed, divorced, separated, never married, or living with a partner?" The answer choices were coded as 0= under 14 years; 1= Married - spouse in household; 2= Married - spouse not in household; 3= Married - spouse in household unknown; 4 = Widowed; 5= Divorced; 6= Separated; 7= Never married; 8= Living with partner; and 9= Unknown marital status. For the purpose of this study, only the answer choice 1= married-spouse in household will be used, and any other response was categorized for differences. Marital status was operationalized as a categorical variable with two categories for the purpose of this study.

The instrument and variable used to assess employment was DOINGLW2. The question was "Correct employment status last week". The answer choices were coded as 1= Working for pay at a job or business; 2= With a job or business but not at work; 3= Looking for work; 4= Working, but not for pay, at a family-owned job or business; 5=

Not working at a job or business and not looking for work; 7= refused; 8= not ascertained; and 9 = don't know." For the analysis of this study, only the response 1 and 4 were included and other answers were excluded. Employment was operationalized as a categorical variable with two categories for the purpose of the study. The NHIS used STMTRU as both instrument and variable to collect data for homelessness. The question asked was "Have you ever spent more than 24 hours living on the streets, in a shelter, or in a jail or prison." The answer choices were 1= yes; 2= no; 7= refused; 8= not ascertained; and 9 = don't know". For the study purpose, only the yes and no answer were calculated, and all others were excluded from the analysis. Homelessness was operationalized as a categorical variable with two categories for the purpose of the study.

Study Analysis

Secondary data from the National Health Instrument Survey 2007 database was used as a reliable source to conduct the analysis. The dataset is available for public use without limitation on the website. Analysis of variables involve the use of Chi-Square to assess the "strength and the direction of association between the variables" (Frankfort-Nachmias & Nachmias, 2008, p. 362) to answer research questions 1 and 3, and the extent to which one variable was foreseen to be related to another (Frankfort-Nachmias & Nachmias, 2008). Multiple logistic regressions analysis was used to measure the association among the variables of high- risk behaviors, such as sex exchanged, men having sex with other men, and having sex with an infected partner. For this bivariate binomial analysis, multiple logistic regressions were used to determine if the independent variables were predictors of HIV testing to answer question 2.

To answer question number 5 and 6, the analysis required utilization of a sequential multiple regressions for selecting the independent variables "one at a time," by their ability to account for the most variance in the dependent variable. Multiple logistic regressions were used to control for age, gender/sex, race, marital status, employment, and homelessness as potential confounders of the association between the independent and dependent variables. I used alpha level of .05 to test the association (Creswell, 2009; Gerstman, 2008).

The NHIS dataset 2007 instrument and variable names used for this analysis included BIPDIS, SUBABYR, HIVTST, STMTRU, AHCSYR1 and AHCAFY_2. All responses coded as yes and no were not included in the analysis, and the rest was excluded as well. These independent variables were examined to determine if they were predictors of HIV testing among bipolar individuals (CDC, 2009). The Statistical Package Social Sciences (SPSS) software program, Student Version 21.0, was used to conduct the data analysis. Predictors related to HIV testing and demographic variables: age, race, gender/sex, employment, marital status, and homelessness as possible outliers were assessed.

Research Questions and Hypotheses

Statistical Analysis for Research Question 1

RQ1: Is having a bipolar diagnosis associated with having ever had an HIV test?

$H_0$1: Having a BPD diagnosis is not associated with having ever had an HIV test.

H_a1: Having a BPD is associated with having ever had an HIV test.

This secondary analysis used a chi-square analysis to examine the possible relationship between having a bipolar diagnosis and obtaining an HIV test among BPD individuals. The independent variable, having a BPD diagnosis, was a nominal variable and could not be ordered. Therefore, a chi-square analysis was appropriated to test the significance between the independent and dependent variable. A chi-square analysis was used to test the null hypothesis that implied that was no relationship between having a BPD diagnosis and obtaining an HIV test. Multiple logistic regression analysis was used to measure or control and adjust for demographic covariates, such as age, gender, employment, marital status, and homelessness status as potential confounders of the association between the independent and dependent variable. Statistical significance was set at alpha = 0.05.

Statistical Analysis for Research Question 2

RQ 2: Is participating in high-risk behaviors (defined as participating in at least one of the following activities: sex exchanged for monetary gain, men having sex with other men, having sex with an infected partner) associated with having ever had an HIV test among bipolar individuals?

$H_0$2: Participating in high-risk behaviors (defined as participating in at least one of the following activities: sex exchanged for monetary gain, men having sex other men, having sex with an infected partner) is not associated with having ever had an HIV test among bipolar individuals.

H_a2: Participating in high risk behaviors (defined as participating in at least one of the following activities: sex exchanged for monetary gain, men having sex with other men,

having sex with an infected partner) is associated with having ever had an HIV test among bipolar individuals.

For the purpose of the analysis, I used logistic regression analysis to estimate and test the association between the independent variable (high-risk behavior), and the dependent variable (having ever had an HIV test) among bipolar individuals. The particularly estimate of interest was the odds-ratio for the association between having ever had an HIV test and high risk behavior. I also used a multiple logistic regression analysis to adjust for the covariates age, gender, employment, marital status, and homelessness status as potential confounders of the association between the independent and dependent variables. Statistical significance was set at alpha = 0.05.

Statistical Analysis for Research Question 3

RQ3: Is inability to afford treatment (such as prescription, therapy, and counseling) for mental health care associated with obtaining an HIV test among bipolar individuals?

$H_0$3: Inability to afford treatment such as prescription, therapy, and counseling for mental health care is not associated with obtaining an HIV test among bipolar individuals.

H_a3: Inability to afford treatment (such as prescription, therapy, and counseling) for mental health care is associated with obtaining an HIV test among bipolar individuals.

A logistic regression was used to estimate and test the association between the independent variable (inability to afford treatment) and dependent variable (having ever had an HIV test) among bipolar individuals. The specific estimate of interest was the odds-ratio for the association of inability to afford treatment to having ever had an HIV

test, among bipolar individuals. I used a multiple logistic regression analysis to adjust for the demographic covariates age, gender, race, employment, marital status, and homelessness status as potential confounders of the association between the independent and dependent variables. Statistical significance was set at alpha = 0.05.

Statistical Analysis for Research Question 4

RQ4: Is non-adherence to treatment for BPD associated with obtaining an HIV test for bipolar individuals?

$H_0$4: Non-adherence to treatment for BPD is not associated with obtaining an HIV test among bipolar individuals.

*Ha*4: Non-adherence to treatment for BPD is not associated with obtaining an HIV test among bipolar individuals**.**

A logistic regression was used to estimate and test the association between the independent variable non-adherence to treatment for BPD and dependent variable, having ever had an HIV test among bipolar individuals. The specific estimate of interest was the odds-ratio for the association of non-adherence to treatment for BPD to having ever had an HIV test, among bipolar individuals. I also used a multiple logistic regression analysis to adjust for the demographic covariates age, gender/sex, race, employment, marital status, and homelessness status as potential confounders of the association between the independent and dependent variables. Statistical significance was set at alpha = 0.05.

Statistical Analysis for Research Question 5

RQ5: Is substance abuse other than alcohol or tobacco associated with obtaining an HIV test among bipolar individuals?

$H_0$5: Substance abuse other than alcohol or tobacco is not associated with obtaining an HIV test among bipolar individuals.

H_a5: Substance abuse other than alcohol or tobacco is associated with obtaining an HIV test among bipolar individuals.

A logistic regression was used to estimate and test the association between the independent variable substance abuse other than alcohol or tobacco and the dependent variable, having ever had an HIV test among bipolar individuals. I used a multiple logistic regression analysis to adjust for the demographic covariates age, gender, race, employment, marital status, and homelessness status as potential confounders of the association between the independent and dependent variables. Statistical significance was set at alpha = 0.05.

Statistical Analysis for Research Question 6

RQ6: Are substance abuse, inability to afford treatment (such as prescription, therapy, and counseling), non-adherence to treatment, and high-risk behaviors potential factors associated with obtaining an HIV test among bipolar individuals?

$H_0$6: Substance abuse, inability to afford treatment (such as prescription, therapy, and counseling), non-adherence to treatment, and high-risk behaviors are not potential factors associated with obtaining an HIV test among bipolar individuals.

H_a6: Substance abuse, inability to afford treatment (such as prescription, therapy, and counseling), non-adherence to treatment, and high-risk behaviors are potential factors associated with obtaining an HIV test among bipolar individuals.

A hierarchical multiple logistic regression was used to estimate and test the association between the independent variables substance abuse, inability to afford treatment (such as prescription, therapy, and counseling), non-adherence to treatment for BPD, and high-risk behaviors as predictors associated with the dependent variable, obtaining an HIV test among bipolar individuals. I also used a multiple logistic regression analysis to adjust for demographic covariates such as age, gender or sex, race, employment, marital status, and homelessness status as potential confounders of the association between the independent and dependent variables. Statistical significance was set at alpha = 0.05.

Threats to Validity

This secondary study had internal threats to validity, due to the nature of the study being quantitative. Primarily, I used a cross-sectional design to analyze the data collected by the NHIS, and the study results could not prove a causal relationship. Secondly, the NHIS used survey questionnaires to collect their data, and the answers were recorded according to individuals' responses, and not objectively verified. For instance, why people were not able to afford treatment and adhere to treatment could not be answered due to the nature of the study being quantitative. Investigators relied on the respondents' answers (i.e., self-report versus actual medical record information). Self–reported answers were subjective in nature, and the degree of under-reporting or over-reporting of perceived beliefs were difficult to determine. Finally, internal validity was stronger with experimental design, and poorer with correlation design. Therefore, this study being a correlational design involved internal validity threat.

External validity threats of the study were related to problems with generalizability due to a population sample (non-institutionalized private citizen, excluding soldiers and prisoners) that might not be representative of the entire bipolar population. Other external validity threats included the following: reduction in the survey sample size household numbers in 2007 of about 50% and 13%, due to Census Bureau budgetary decrease. The sample was not randomly chosen; instead they used complex and multistage technique to select the population sample. During data collection, the population was probably over-sampled to make sure they had enough participants. Large sample-size of the population is needed for generalizability of the study outcome, and the greater the sample size of the population, the better chance the investigator had in generalizing the study result. Due to decrease in the NHIS 2007 population sample-size, generalizability of the study was limited.

Ethical Consideration

This study used secondary data from the NHIS 2007 dataset; therefore, identification of participants' names was not available. For analysis of the data, code and number were used to test the variables' relationship. The NHIS data were available to the public, and all individuals' information was protected. For further protection of the individuals who participated in the study, I requested permission from the Walden IRB before the study analysis process began. After that, I reviewed the records, the data was stored in a safe place for several years, and would be destroyed at a later date.

Summary

Chapter 3 included a description of thorough approach for the quantitative study of the variables having a bipolar diagnosis; participating in high-risk behaviors (defined as participating in at least one of the following activities: sex exchanged for monetary gain, men having sex with other men, having sex with an infected partner); inability to afford treatment (such as prescriptions, therapy, and counseling); non-adherence to treatment; and substance abuse other than alcohol or tobacco as predictors of obtaining an HIV test among individuals diagnosed with BPD. Detailed information was provided for the study research design and rationale, data collection, population and sampling technique, sample and sampling methodology, sample size and power analysis, instrumentation and materials, and study analysis. It also included research questions, hypotheses, statistical analysis methodology for the research questions, threats to internal and external validity, and ethical considerations.

In Chapter 4, I provide a description of data reviewed, sample analysis, and results for logistic and multiple logistic regressions. I also provide summary of the study results from the data analyses, along with statistical findings on demographics, and explanation of the population investigated.

Chapter 4: Results

Introduction

The purpose of this quantitative secondary analysis study was to explore the relationship between having a bipolar diagnosis, high-risk behaviors, inability to afford treatment (as defined by prescription drugs, therapy/counseling for mental health care), non-adherence to treatment for BPD, and substance abuse other than alcohol and tobacco, and if there are predictors of the outcome variable, HIV testing. The study also examined whether demographic such as (age, race, gender, employment, marital status, and homelessness status) were confounding factors of HIV testing among individuals diagnosed with BPD. The chapter includes a description of the procedure of data review and analysis, the results of the analysis for the six research questions and hypotheses, findings, and conclusion.

A quantitative cross-sectional design was used to explore the association between having a bipolar diagnosis, high-risk behaviors, inability to afford treatment such as (prescription drugs, therapy/counseling), non-adherence to treatment, substance abuse, and obtaining an HIV test.

Research Questions and Hypotheses

The following research questions and hypotheses of the study were generated from the literature review on BPD and HIV testing research.

RQ1: Is having a bipolar diagnosis associated with having ever had an HIV test?

$H_0$1: Having a BPD diagnosis is not associated with having ever had an HIV test.

H_a1. Having a BPD is associated with having ever had an HIV test.

RQ2: Is participating in at least one high risk behaviors (including sex exchanged for monetary gain, men having sex with other men, having sex with an infected partner) associated with having ever had an HIV test among bipolar individuals?

$H_0$2: Participating in high-risk behaviors (defined as participating in at least one of the following activities sex exchange for monetary gain, men having sex other men, having sex with an infected partner) is not associated with having ever had an HIV test among bipolar individuals.

H_a2: Participating in high risk behaviors, defined as participating in at least one of the following: sex exchange for monetary gain, men having sex with other men, having sex with an infected partner is associated with having ever had an HIV test among bipolar individuals.

RQ3: Is an inability to afford treatment (including prescription drugs, therapy, and counseling for mental health care) associated with obtaining an HIV test among bipolar individuals?

$H_0$3: Inability to afford treatment (including prescription drugs, therapy, and counseling for mental health care) is not associated with obtaining an HIV test among bipolar individuals.

H_a3: Inability to afford treatment (including prescription drugs, therapy, and counseling for mental health care) is associated with obtaining an HIV test among bipolar individuals.

RQ4: Is non-adherence to treatment for BPD associated with obtaining an HIV test among bipolar individuals?

$H_0$4: Non-adherence to treatment for BPD is not associated with obtaining an HIV test among bipolar individuals.

H_a4--Non-adherence to treatment for BPD is associated with obtaining an HIV test among bipolar individuals.

RQ5: Is substance abuse other than alcohol or tobacco associated with obtaining an HIV test among bipolar individuals?

$H_0$5: Substance abuse other than alcohol or tobacco is not associated with obtaining an HIV test among bipolar individuals.

H_a5: Substance abuse other than alcohol or tobacco is associated with obtaining an HIV test among bipolar individuals.

RQ6: Are substance abuse, inability to afford treatment (including prescription drugs, therapy, and counseling), non-adherence to treatment, and high-risk behaviors potential factors associated with obtaining an HIV test among bipolar individuals?

$H_0$6: Substance abuse, inability to afford treatment (including prescription drugs, therapy, and counseling), non-adherence to treatment, and high risk behaviors are not potential factors associated with obtaining an HIV test among bipolar individuals.

H_a6: Substance abuse, inability to afford treatment (including prescription drugs, therapy, and counseling), non-adherence to treatment, and high risk behaviors are potential factors associated with obtaining an HIV test among bipolar individuals.

Data Collection

I conducted a secondary data analysis using data from the National Health Instrument Survey (NHIS) 2007 database. The data set has been used by previous

researchers as a reliable source to conduct analysis. The original study included "29,266 households, which generated data from 75,764 people in 29,915 families" (CDC, 2009, p. 11). The number was reduced to 23,393 participants excluding adults who were unable to answer the survey questionnaire from ages 18 and above (18-84). Among the 23,393 people enrolled in the study, 387 reported having BPD. An extraction of data was performed from the NHIS 2007 database during the data review process by grouping the variables of interest into a new dataset to facilitate analysis of the data.

While conducting the data review/cleaning, some discrepancies were found such as (AHCAFY_2 variable was coded as AHCAFY2 in the SPSS data file), question number 3 (inability to afford treatment as stated in chapter 3 was recorded as can't afford treatment such as prescription, therapy or counseling). For the purpose of the study, can't afford treatment such as (prescription, therapy or counseling) was used for the analysis. After removing the duplicate data, the sample size of people reported having BPD was reduced to 383 instead of 387. All variable answers were coded as 1= yes, 2 = no, and the other answers were excluded from the analysis.

I coded the marital status data as married or not married (as a dummy variable, MS_RECODE). The MS_RECODE variable was coded as10 for married and11 for non-married. I created a dummy variable for age, Age_Recode (that included two age groups 18-29, 30-85). The two age variables were coded as 1= 18-29, 2 = 30-85, and the other answer was excluded from the analysis. This transformation eliminated the age variable from being continuous to a categorical variable.

Demographic Characteristics of the Sample

The NHIS 2007 study sample included 23, 393 U.S. civilian non-institutionalized participants aged 18 to 84. Among the participants who enrolled in the study survey questionnaire, 383 (non-duplicate) reported having BPD. The mean age for the 22, 851 participants who completed the survey were 47.70 and median (46). The descriptive frequency statistic result for the age variable included (Mean = 1.56, Median = 2.00, Mode = 2.00, and Standard Deviation = .70889).

I created a dummy variable for age, Age_Recode (that included two age groups 18-29, 30-85). The two age variables were coded as 1= 18-29, 2 = 30-85, and the other answer was excluded from the analysis. This transformation changed the age variable to a categorical instead of a continuous variable. Table 4 displays the percentage and age range of the new dummy variable, and the age range of 30-85 will be used in the analysis.

Table 4

New Recoded Variable for Age: AGE_P

Variable	Percent	Totals
Age_P		
All other	12.8	2926
18-29	18.4	4203
30-85	68.8	15722
Total	100.0	22851

For race and ethnicity, the data showed that 76% were White, 16.1% were Black/African American, AIAN was 1%, Asian was 5.2%, and multiple races were 1.5% (See Table 5).

Table 5

Frequency Distribution for Race/Ethnicity variables: Multiple Race groups (OMB groups w/multiple race) (N=22, 851)

Variable		Frequency	Percent	Total
Valid	White only	17375	76.0	17375
	Black/African American only	3689	16.1	3689
	AIAN only	223	1.0	223
	Asian only	1193	5.2	1193
	Race group not releasable (See file layout)	29	.1	29
	Multiple race	342	1.5	342
	Total	22851	100.0	

The frequency distribution indicated that more females (55.9%) participated in the study, while males accounted for (41.1%). Over half percent of the study participants was employed (58.6); 52.2 were married; and 5.6 were homeless (See Table 6).

Table 6

Frequency Distributions for Study Population by Gender, Employment Status, Marital Status and Homeless Status (N = 22851)

Variable	**Frequency**	**Percent**	**Total**
Male	10074	41.1	10074
Female	12777	55.9	12777
Employed	13391	58.6	13391
Married	11925	52.2	11925
Homeless	1275	5.6	1275
Totals	22851	100.0	22851

The study sample included 22,851 participants, where 383 of them reported having BPD. With a large sample of over 300 hundred people, the analysis did provide better results for the study. The greater the sample size of the population, the better chance I had in generalizing the study outcome. The study sample was representative of the population of interest due to its large sample size. My confidence in the study sample being representative is that the NHIS dataset has been used before by many researchers, and has been proven both valid and reliable.

Results

I used the Statistical Package for Social Sciences (SPSS) software program Student Version 21.0, to conduct the data analysis. The predictor variables of the study were dichotomous, as well as the outcome variable. The analyses included a chi-square analysis for the first research question to test the strength of the association between the independent and the outcome variable. To test for an association between x and y, a bivariate analysis was conducted for having a bipolar diagnosis and obtaining an HIV test. For RQ2, a binary logistic regression was used for high risk behaviors (as defined by: are any of these statements true: men having sex with other men, sex exchanged for monetary gain, and having sex with an infected partner).

I performed binary logistic regressions and bivariate analyses for RQ3, RQ4, and RQ5. Additionally, multiple logistic regressions were used for each independent variable and demographic (age, race, gender, marital status, employment, and homelessness status). For RQ6, hierarchical logistic regressions were used to incorporate all variables into a model along with the demographic. The reliability and validity of correlation and regression analyses are associated with having a large sample size; therefore, the study sample size being 383 is large enough to produce a strong result with a power of 0.80.

Hence, instead of conducting a single regression model to assess the association of the predictor variables upon the outcome variable, obtaining an HIV testing, each independent variable was assessed in a single chi square and binary logistic regressions for (having a bipolar diagnosis, high-risk behaviors, inability to afford treatment (prescriptions, therapy/counseling), non-adherence to treatment, and substance abuse). I

also used bivariate regression models to assess the association between the independent and the outcome variable. I ran a separate multiple logistic regression analysis for each demographic variable (age, race, gender/sex, marital status, employment status, and homelessness) to determine whether they were potential confounders of HIV testing. Additionally, a correlation matrix was computed to provide further information on the variable correlations. Results associated with individual research questions and hypotheses are introduced independently.

Hypothesis 1 Results

I rejected the $H_0$1, which stated: having a BPD diagnosis is not associated with having ever had an HIV test. To test the association between having a bipolar diagnosis disorder and having ever had an HIV test, a chi square and bivariate analysis was conducted. The findings indicated that having a BPD diagnosis had a strong relationship with HIV testing (chi square =98.539, N= 21734, p = .000). I calculated a binary logistic regression to further test the relationship, and the result showed that (chi-square = 94.958, df = 1, p = .000). The finding indicates that having a BPD is a significant predictor of ever had an HIV test (See Table 7).

Table 7

Chi Square Table for Having a BPD and Ever been Tested for HIV

Variable	X^2	Df	P
Ever Been Told you had Bipolar And Ever been Tested for HIV	98.539[a]	1	.000*

Table 8 displays a cross tabulation for having a BPD and obtaining an HIV test. The people who reported having BPD were 228 and among them, 137.3 had an HIV test. The percentage of people who had a bipolar diagnosis and an HIV test was 2.7%. While the percentage of participants who did not have the bipolar or tested for HIV were about 97.3% and 99.0%. I ran a binary logistic regression to establish the association between having a bipolar diagnosis and having ever had an HIV test.

Table 8

Cross-Tabulation for the Independent Variable: Ever Had Bipolar Diagnosis and HIV Testing (N=13288)

			Ever told you had BPD		Total
			Yes	No	
Ever been tested for HIV	Yes	Count	228	8087	8315
		Expected Count	137.3	8177.7	8315.0
		% within Ever been tested for HIV	2.7%	97.3%	100.0%
	No	Count	131	13288	13419
		Expected Count	221.7	13197.3	13419.0
		% within Ever been tested for HIV	1.0%	99.0%	100.0%
Total		Count	359	21375	21734
		Expected Count	359.0	21375.0	21734.0
		% within Ever been tested for HIV	1.7%	98.3%	100.0%

I ran a second logistic regression to test the strength of the relationship by using the Phi Cramer's V for the variables, having a BPD and ever been tested for HIV. The result indicated (Phi Cramer's V = .067; N= 21; p = .000), which demonstrated a strong association between having a BPD and HIV testing. For the demographic variable, a multiple logistic regression was conducted, and the results showed that having an HIV test was related to gender, having a bipolar diagnosis, age, homelessness, race, and more females were likely to being tested for HIV. The demographic variables employment and marital status were not predictors of having an HIV test. However, after using the Bonferroni correction to adjust or control for family wise error/Type 1 error for the 7 correlations (.05 by 7 = .007 or .01 round up), the association was statistically significant with a p =.000 or p < .01. The data indicated there was no violation of normality, linearity or homoscedasticity.

A correlation coefficient was calculated for the demographic variables, having a bipolar diagnosis, and obtaining an HIV test. The results indicated that a significant association between age, the dummy variable (p = .038), race (p = .000), sex (p =.000), homelessness (p =.000), marital status (p =.005), having a BPD (p = .000) with HIV testing. The findings indicate that 6 of 7 correlations are statistically significant with a p-value < .05. However, the Bonferroni correction was calculated to adjust or control for family wise error/Type 1 error for the 7 correlations (.05 by 7 = .007 or .01 round-up). After using the Bonferroni correction, only sex, race, homelessness, marital status, and BPD remained significant with a p < .01. The result indicates that there is a strong relationship between the independent variable, having a BPD, demographic, and HIV

testing with a collinearity of .993. Significance level for the predictors is shown below in the correlation Table 9 with asterisks**.**

Table 9

Coefficient: Multiple Logistic Regressions for Demographic Variables (N = 13282)

Model	B	S.E.	Beta	df	t	Sig.	Collinearity/Tolerance	VIF
(Constant)	1.647	.107	---	6	15.397	.000	---	----
AGE_P	-.019	.009	.018	6	-2.053	.040	.970	1.031
OMB groups w/multiple race	-.028	.005	-.053	6	-6.171	.000	.995	1.005
Sex	-.103	.009	-.104	6	11.914	.000	.969	1.031
Corrected employment status last week	.018	.022	.007	6	.821	.412	.998	1.002
Spent 24+ hrs living in street, shelter, jail/prison RECODED	.202	.019	.090	6	10.383	.000	.980	1.020
MARITAL STATUS	-.025	.009	-.025	6	-2.85	.004	.950	1.052
(Constant)	1.318	.139	---	6	9.466	.000	----	----
AGE_P	-.019	.009	-.018	6	-2.072	.038	.970	1.031
OMB groups w/multiple race	-.028	.005	.053	6	-6.218	.000*	.995	1.005
Sex	.102	.009	-.103	6	-11.769	.000*	.968	1.033
Corrected employment status last week	-.020	.022	.008	6	895	.371	.997	1.003
Spent 24+ hrs living in street, shelter, jail/prison RECODED	.197	.020	.088	6	10.098	.000*	.975	1.025
MARITAL STATUS	-.025	.009	-.025	6	-2.503	.005*	.950	1.052
Ever told you had BPD	.166	.045	.032	6	3.687	.000*	.993	1.007

Table 10 displays the two models utilized to further assess relationship between demographic, having a BPD, and HIV testing. It shows little difference between the two models with an Adjusted R square of (.021 and .022), F change of (48.823 and 13.596) and a significant p = .000, which remains significant after the Bonferroni correction with a $p < .01$.

Table 10

Multiple Logistic Regression for Having a Bipolar Diagnosis, Demographic, and HIV Testing (N =13272)

Model	R	R^2	Adjusted R^2	S.E.	R^2Change	F Change	df	N	Sig.
1	.147	.022	.021	.490	.022	48.823	6	13275	.000*
2	.150	.023	.022	.490	.022	13.596	1	13274	.000*

Hypothesis 2 Results

I rejected $H_0$2 that stated: participating in high risk behaviors (defined as participating in at least one of the following activities: sex exchanged for monetary gain, men having sex with other men, having sex with an infected partner) is not associated with obtaining an HIV test among bipolar individuals. To test the association between the independent and dependent variables, a binary logistic regression was conducted, and the results revealed that high risk behaviors were significantly associated with obtaining an HIV test (chi-square =235.458, df = 1, p =.000; See Table 11).

Table 11

Chi Square for High-Risk Behaviors and HIV Testing

Model	Chi-Square	Df	Sig
Step 1	235.458	1	.000

I ran a multiple logistic regression to test for association between the independent variable, high risk behaviors (defined as participating in at least one of the following activities: sex exchanged for monetary gain, men having sex with other men, having sex with an infected partner), demographic variables as a potential confounder, and obtaining an HIV test. The result indicated that 4 out of 6 demographic variables (homelessness, sex, race, age) were associated with high risk behaviors and obtaining an HIV test.

Table 12 displays a strong association between high risk behaviors ($p = .000$), marital status ($p = .025$), homelessness ($p = .000$), sex ($p = .000$), and race ($p = .000$) with HIV testing at $p < .05$. However, after the Bonferroni correction at a p-value of .007 or round up to .01, only high risk behaviors, homelessness, race, and sex remained significant at a p-value $< .01$ (See Tables 12 and 13).

Table 12

Multiple Logistic Regression for High Risk Behavior, Demographic, and HIV Testing (N= 13036)

Model		B	Std. Error	Beta	T	Sig	Tolerance	VIF
1	(Constant)	1.644	.108		15.234	.000	-----	----
	AGE_P	-.018	.009	-.017	-1.921	.055	.970	1.031
	OMB groups w/multiple race	-.029	.005	-.055	-6.336	.000*	.995	1.005
	Sex	-.103	.009	-.104	-11.788	.000*	.969	1.032
	Corrected employment status last week	.015	.022	.006	.671	.502	.998	1.002
	Spent 24+ hrs living in street, shelter, jail/prison	.202	.020	.090	10.262	.000*	.980	1.020
	RECODED MARITAL STATUS	-.025	.009	-.025	-2.768	.006*	.950	1.052
2	(Constant)	1.133	.119	--	9.552	.000*	--	---
	AGE_P	-.017	.009	-.016	-1.819	.069	.970	1.031
	OMB groups w/multiple race	-.029	.005	-.055	-6.361	.000*	.995	1.005
	Sex	-.105	.009	-.106	-12.099	.000*	.968	1.033
	Corrected employment status last week	.017	.022	.007	.760	.447	.998	1.002
	Spent 24+ hrs living in street, shelter, jail/prison	.181	.020	.080	9.159	.000*	.969	1.032
	RECODED MARITAL STATUS	-.020	.009	-.020	-2.245	.025	.948	1.055
	Are any of these statements true	.256	.025	.089	10.187	.000*	.984	1.016

Note. Significant *p* values are marked with asterisks.

Table 13

Multiple Logistic Regression for High Risk Behaviors, Demographic, and HIV Testing (N = 13272)

Model	R	R^2	Adjusted R^2	S.E.	R^2Change	F Change	df	N	Sig.
1	147	.022	.021	.490	.022	48.654	6	13265	.000
2	.157	.023	.022	.490	.001	15.987	1	13268	.000

Hypothesis 3 Results

I rejected $H_0$3 that stated: inability or can't afford treatment (such as prescription, therapy or counseling) for mental health is not associated with having an HIV test among bipolar individuals. To assess the association, a binary logistic regression analysis was used to determine the relationship among the independent and dependent variable. In addition, a multiple logistic regression was used to determine whether demographic (age, race, sex, marital status, employment, and homelessness status) as potential confounders of the association. The logistic binary regression result indicated that the independent variable inability to afford treatment (such as prescription, therapy or counseling) was associated with obtaining an HIV test among bipolar individuals (chi-square = 116.364; df =1; N=22851; p = 000). The result also revealed a moderate Nagelkerke R2 = .007 (See Table 14).

Table 14

Binary Logistic Regression for Inability to Afford Treatment and HIV Testing

		Chi-square	Df	Sig.
Step 1	Step	116.364	1	.000
	Block	116.364	1	.000
	Model	116.364	1	.000

Table 15 displays the two models. In model 1, the results are (Adjusted R2 = .021, df = 6; N = 13265; p = .000 at a p < .05). The second model however, showed a little difference in the (Adjusted R2 = .022; df = 1; N = 13268; p = .000). The logistic regression result indicated that there was a slight difference between model 1 and 2 for the Adjusted R square (.021 and .027). In addition, the multiple logistic regressions finding indicated that the demographic variables (race = p .000, sex = p .000, homelessness = p.000, and marital status = p.006) and the independent variable, inability to afford treatment for (drug prescriptions, therapy or counseling) are both confounding factors and predictor of HIV testing. However, after the Bonferroni correction, the relationship between the independent predictor, inability to afford treatment for (drug prescriptions, therapy, or counseling) and all four demographic variables remained significant with a p < .01.

Table 15

Multiple Logistic Regression for Inability to afford Treatment for bipolar, Demographic, and HIV Testing (N= 13272)

Model	R	R^2	Adjusted R^2	S.E.	R^2Change	F Change	df	N	Sig.
1	.147	.022	.021	.490	.022	48.654	6	13269	.000
2	.151	.023	.022	.490	.001	15.987	1	13268	.000

Hypothesis 4 Results

I rejected the $H_0$4 that indicated: non-adherence to treatment for BPD is not associated with obtaining an HIV test among bipolar individuals. A logistic binary regression analysis was used to assess the association. The result indicated that non-adherence to treatment for BPD was associated with obtaining an HIV test among bipolar individuals (chi-square = 280. 754; N = 13272; df =1; p = .000; Nagelkerke R^2 = .017). A multiple logistic regression was used also to test the association between non-adherence to treatment, the demographic variables, and HIV testing. The result indicated that non-adherence to treatment for bipolar, race/gender sex, marital status, and homelessness was associated with obtaining an HIV test among bipolar individuals.

Table 16 displays a slight difference between model 1 and 2 for the Adjusted R square (.021 and .027). This result indicated that the demographic variables and non-adherence to treatment for bipolar are a predictor of HIV testing with p = .000.

Table 16

Multiple Logistic Regression for Non-adherence for treatment for bipolar, Demographic, and HIV Testing (N= 13272)

Model	R	R^2	Adjusted R^2	S.E.	R^2 Change	F Change	df	N	Sig.
1	.147	.021	.021	.490	.021	48.533	6	13265	.000*
2	.167	.028	.027	.488	.006	86.385	1	13264	.000*

Additionally, a multiple logistic regression was conducted to further test the association between non-adherence to treatment, demographic, and HIV testing. The result indicated that non-adherence to treatment for bipolar, gender/sex; race, marital status, and homelessness were associated with obtaining an HIV test among bipolar individuals. However, after using the Bonferroni correction to adjust or control for family wise error/Type 1 error for the 7 correlations (.05 by 7 = .007 or .01 round-up), only 4 out of 7 correlations remained statistically significant with HIV testing (sex, race, homelessness, and non-adherence to treatment for bipolar) at a $p < .01$) .

Table 17 displays that non-adherence to treatment for bipolar, demographic (race, marital status, sex, homelessness) are associated with HIV testing among bipolar individuals. The multiple logistic regression correlation findings indicated that non-adherence to treatment for bipolar ($p = .000$), race ($p = .000$), sex ($p = .000$), and homelessness ($p = .000$) are associated with HIV testing. The correlation coefficient showed a strong collinearity of .997 among the independent, demographic, and the outcome variable (See Table 17).

Table 17

Coefficient Table for Non-adherence to Treatment for Bipolar, Demographic, and HIV Testing

Model		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	1.649	.107	---	15.408	.000	----	---
	AGE_P	-.019	.009	-.018	-2.049	.041	.970	1.031
	OMB groups w/multiple race	-.028	.005	-.053	-6.161	.000	.995	1.005
	Sex	-.102	.009	-.103	-11.848	.000	.969	1.032
	Corrected employment status last week	.018	.022	.007	.825	.409	.998	1.002
	Spent 24+ hrs living in street, shelter, jail/prison	.202	.019	.090	10.365	.000	.980	1.020
	RECODED MARITAL STATUS	-.025	.009	-.025	-2.885	.004	.950	1.052
2	(Constant)	1.276	.114	---	11.197	.000	---	---
	AGE_P	-.017	.009	-.016	-1.822	.069	.969	1.032
	OMB groups w/multiple race	-.029	.004	-.055	-6.406	.000*	.994	1.006
	Sex	-.097	.009	-.098	-11.283	.000*	.966	1.036
	Corrected employment status last week	.025	.022	.010	1.142	.254	.997	1.003
	Spent 24+ hrs living in street, shelter, jail/prison	.194	.019	.086	9.958	.000*	.978	1.022
	RECODED MARITAL STATUS	-.022	.009	-.022	-2.460	.014	.948	1.055
	Seen/talked to mental health professional, past 12 m	.171	.018	.080	9.294	.000*	.990	1.010

Hypothesis 5 Results

I rejected $H_0$5 that indicated substance abuse other than alcohol is not associated with obtaining an HIV test among bipolar individuals. To assess the association between substance abuse other than alcohol and obtaining an HIV test among bipolar individual, a binary logistic regression was used. The findings indicated that the association was significant with (chi-square = 27.04; df = 1; N = 22,851; p = .000 at p < .05). A multiple logistic regression analysis was computed to examine the independent variable non-adherence to treatment, demographic variables such as (age, race, sex, employment, marital status, and homelessness status), and HIV testing. All the variables were put together into a model to see which variables were associated with HIV testing. The results revealed that age (p =.034), sex (p = .000), race (p = .000), homelessness (p = .000), marital status (p = .005), and substance abuse (p = .014) were statistically significant at a p < .05 and associated with obtaining an HIV test. The two models indicated a slight difference between the Adjusted R square of (.021 and .022), df (6, 1), and (p = .000 and p = .014), which showed an association between substance abuse, demographic, and HIV testing (See Table 18).

Table 18

Multiple Logistic Regression for Substance Abuse, Demographic, and HIV Testing (N = 13271)

Model	R	R^2	Adjusted R^2	S.E.	R^2 Change	F Change	df	N	Sig.
1	.147	.022	.021	.490	.022	48.533	6	13271	.000
2	.149	.022	.022	.488	.000	6.043	1	13270	.014

The coefficient model indicated that collinearity (Tolerance) values for all variables were above .950. The findings revealed that employment, substance abuse, and age status were not related to obtaining an HIV test. Table 18 represents the significant associations by asterisks. After using the Bonferroni correction, only race, sex, homelessness, and marital status remained significant with a $p < .01$ (See Table 19).

Table 19

Multiple Logistic Regression Coefficient for Substance Abuse, Demographic, and HIV Testing (N= 13271)

Model		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	1.645	.107		15.379	.000		
	Sex	-.103	.009	-.104	-11.924	.000	.969	1.032
	Corrected employment status last week	.018	.022	.007	.821	.412	.998	1.002
	OMB groups w/multiple race	-.028	.005	-.053	-6.184	.000	.995	1.005
	Spent 24+ hrs living in street, shelter, jail/prison	.202	.019	.090	10.388	.000	.980	1.020
	RECODED MARITAL STATUS	-.025	.009	-.025	-2.836	.005	.950	1.052
	AGE_P	-.019	.009	-.018	-2.069	.039	.970	1.031
2	(Constant)	1.354	.160		8.480	.000		
	Sex	-.103	.009	-.104	-11.974	.000*	.969	1.032
	Corrected employment status last week	.018	.022	.007	.840	.401	.998	1.002
	OMB groups w/multiple race	-.028	.005	-.053	-6.192	.000*	.995	1.005
	Spent 24+ hrs living in street, shelter, jail/prison	.198	.020	.088	10.090	.000*	.970	1.030
	RECODED MARITAL STATUS	-.025	.009	-.025	-2.795	.005	.950	1.053
	AGE_P	-.020	.009	-.018	-2.120	.034	.970	1.031
	Substance abuse, past 12 months	.149	.061	.021	2.458	.014	.988	1.012

Hypothesis 6 Results

I failed to reject $H_0$6, which stated having a bipolar diagnosis, substance use, inability or can't afford treatment (such as drug prescriptions, therapy, and counseling), non-adherence to treatment, and high risk behaviors are not potential factors associated with obtaining an HIV test among bipolar individuals. To assess the association, a hierarchical multiple logistic regression model was used to enter the independent variables. The result showed an adjusted R square of (.026 and .050), which explained that (2.6 and 5%) change in the variance of accountability (not much significant), while (p = .000) was statistically significant. The adjusted R square for the first model (.048) showed a change of variance and accountability (4.8%, p = .000). The second model showed an adjusted R square of (.061) with a change of variance and accountability of 6.1%, (p = .000; See Table 20).

Table 20

Multiple Logistic Regression Hierarchical Analysis for the Independent Variables (N = 21230)

Model	R	R^2	Adjusted R^2	S.E.	R^2 Change	F Change	df	N	Sig.
1	.162	.026	.026	.480	.026	114.108	6	21230	.000
2	.223	.050	.050	.474	.024	527.697	1	21229	.000

In the second analysis, I also used a hierarchical multiple logistic model to enter the demographic variables one by one, with age first as a block for control. All five independent variables were also entered as a block for control as well. In the first model,

having a bipolar diagnosis had a $p = .002$, high risk behaviors $p = .000$, inability to afford treatment such as (drug prescriptions, therapy/counseling) with $p = .000$, non-adherence to treatment for bipolar $p = .000$, and substance abuse $p = .049$ were statistically significant at a $p < .05$. Both collinearity and tolerance were met with values .993 and 1 (See Table 21).

Table 21

Coefficient Table for the Independent Variables and Age

Model		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	.116	.102		1.141	.254		
	Ever told you had BPD	.084	.028	.022	3.028	.002	.882	1.134
	Can't afford mental health care/counseling, 12 m	.147	.021	.048	6.850	.000	.947	1.056
	Seen/talked to mental health professional, past 12 m	.180	.014	.093	12.949	.000	.893	1.120
	Substance abuse, past 12 months	.084	.043	.013	1.970	.049	.977	1.024
	Are any of these statements true	.269	.020	.092	13.485	.000	.979	1.021
2	(Constant)	.380	.101		3.755	.000		
	Ever told you had BPD	.080	.027	.021	2.916	.004	.882	1.134
	Can't afford mental health care/counseling, 12 m	.128	.021	.042	6.055	.000	.945	1.058
	Seen/talked to mental health professional, past 12 m	.165	.014	.085	12.003	.000	.891	1.122
	Substance abuse, past 12 months	.086	.042	.014	2.048	.041	.977	1.024
	Are any of these statements true	.254	.020	.087	12.898	.000	.978	1.022
	AGE_P	-.106	.005	-.154	-22.972	.000	.993	1.007

In Table 22, a coefficient analysis was computed for race and the five independent variables. Race was entered as a block along with the independent variables: having a BPD, high risk behaviors, inability to afford treatment, non-adherence to treatment for bipolar, substance abuse, and HIV testing. The results showed that the independent variables having bipolar with a $p = .004$; high risk behaviors $p = .000$; inability or can't afford treatment $p = .000$; non-adherence to treatment $p = .000$; substance abuse $p = .041$, and age $p = .000$) at a $p < .05$ were associated with HIV testing. All variables were significant at a $p < .05$, but substance abuse was not at ($p = .056$). After the Bonferroni correction, 5 of 6 variables remained significant with a $p < .01$.

Table 22

Coefficient Analysis for the Independent Variables and Demographic (sex, employment, marital status, homelessness)

Model		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	.203	.157	---	1.294	.196	----	---
	Ever told you had BPD	.075	.047	.014	1.593	.111	.939	1.065
	Can't afford mental health care/counseling, 12 m	.088	.030	.026	2.927	.003	.949	1.053
	Seen/talked to mental health professional, past 12 m	.163	.019	.076	8.504	.000	.943	1.061
	Substance abuse, past 12 months	.120	.061	.017	1.963	.050	.990	1.010
	Are any of these statements true	.247	.025	.086	9.793	.000	.985	1.015
2	(Constant)	.407	.187	---	2.174	.030	---	---
	Ever told you had BPD	.047	.047	.009	.990	.322	.936	1.069
	Can't afford mental health care/counseling, 12 m	.053	.030	.016	1.771	.077	.942	1.061
	Seen/talked to mental health professional, past 12 m	.147	.019	.069	7.729	.000	.937	1.067
	Substance abuse, past 12 months	.095	.061	.014	1.561	.119	.980	1.020
	Are any of these statements true	.236	.025	.082	9.343	.000	.973	1.028
	Sex	-.100	.009	-.101	-11.517	.000	.960	1.042
	Corrected employment status last week	.024	.022	.010	1.115	.265	.996	1.004
	Spent 24+ hrs living in street, shelter, jail/prison	.169	.020	.075	8.525	.000	.952	1.050
	RECODED MARITAL STATUS	-.017	.009	-.017	-1.974	.048	.977	1.023

For the third multiple logistic regression, the demographic variables were entered hierarchically as a block for control purpose, and 4 out of 6 variables were significant (p = .000). Marital status and employment were not associated with obtaining an HIV test among bipolar individuals. In the second model, age, race, sex, homelessness, high risk behaviors, and non- adherence to treatment for bipolar were significant (p=.000). After using the Bonferonni correction, only the independent variables having a bipolar

diagnosis, high risk behaviors, inability to afford treatment, non-adherence to treatment for bipolar, and age remained significant with a $p < .01$.

Table 23 displays the result of the multiple logistic regressions. The coefficient analysis for the five independent variables, and demographic (sex, employment, marital status, and homelessness) was calculated. The results indicated that marital status and employment were not associated with obtaining an HIV test among bipolar individuals. In the second model, age, race, sex, homelessness, high risk behaviors, and non-adherence to treatment for bipolar were significant ($p = .000$). Additionally, the results indicated that having a BPD ($p = .332$), inability to afford treatment ($p = .077$), substance abuse ($p=.119$), and employment ($p = .265$) were not associated with HIV testing among bipolar individuals. Only non-adherence to treatment ($p = .000$), high risk behaviors ($p = .000$), sex ($p = .000$), homelessness ($p = .000$), and marital status ($p = .048$) were predictors of HIV testing. After the Bonferroni correction, however, only non-adherence to treatment, high risk behaviors, homelessness, and sex remained significant with $p <.01$ (See Table 23).

Table 23

Coefficient Analysis for the Independent Variables and Demographic (sex, employment, marital status, homelessness)

Model		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	.203	.157	---	1.294	.196	---	---
	Ever told you had BPD	.075	.047	.014	1.593	.111	.939	1.065
	Can't afford mental health care/counseling, 12 m	.088	.030	.026	2.927	.003	.949	1.053
	Seen/talked to mental health professional, past 12 m	.163	.019	.076	8.504	.000	.943	1.061
	Substance abuse, past 12 months	.120	.061	.017	1.963	.050	.990	1.010
	Are any of these statements true	.247	.025	.086	9.793	.000	.985	1.015
2	(Constant)	.407	.187		2.174	.030		
	Ever told you had BPD	.047	.047	.009	.990	.322	.936	1.069
	Can't afford mental health care/counseling, 12 m	.053	.030	.016	1.771	.077	.942	1.061
	Seen/talked to mental health professional, past 12 m	.147	.019	.069	7.729	.000	.937	1.067
	Substance abuse, past 12 months	.095	.061	.014	1.561	.119	.980	1.020
	Are any of these statements true	.236	.025	.082	9.343	.000	.973	1.028
	Sex	-.100	.009	-.101	-11.517	.000	.960	1.042
	Corrected employment status last week	.024	.022	.010	1.115	.265	.996	1.004
	Spent 24+ hrs living in street, shelter, jail/prison	.169	.020	.075	8.525	.000	.952	1.050
	RECODED MARITAL STATUS	-.017	.009	-.017	-1.974	.048	.977	1.023

Summary

The chapter included the results of all analyses conducted for testing all six hypotheses and the outcome variable. The Ho1 was rejected because having a bipolar diagnosis was a predictor of obtaining an HIV test. However, for the demographic age, race, sex, marital status, employment, and homelessness, only (age, race, sex, homelessness) were found to be potential confounders with obtaining an HIV test. After using the Bonferonni correction, the independent variable, having a BPD remained statistically significant, as well as the age, race, sex, and homelessness.

$H_0$2 was rejected because the findings showed statistical significance between high risk behaviors and obtaining an HIV test. However, only 4 of 6 demographic variables (age, sex, race, homelessness) were associated with high risk behaviors and obtaining an HIV test. Marital status and employment were not potential confounders of high risk behaviors and obtaining an HIV test. After the Bonferroni correction, the independent variable and demographic (age, sex, race, and homelessness) remained significant.

$H_0$3 was also rejected due to the significance of the analysis results. The independent variable inability or "can't afford treatment" such as prescription, therapy or counseling was statistically significant. In addition, the demographic (age, race, sex, homelessness) were found to be potential factors of the independent and the outcome variable. The Bonferroni correction was used to prevent type I error, and the independent variable along with the demographic variables age, race, sex, and homelessness showed statistical significance.

The $H_0$4 was rejected because non-adherence to treatment for BPD was statistically significant, even after the Bonferroni correction. Again, having employment and being married were not potential factors of non-adherence to treatment and obtaining an HIV test among bipolar individuals, however, age, race, sex, homelessness were associated with non-adherence to treatment and obtaining an HIV test among bipolar individuals.

The $H_0$5 was rejected as well, because substance use was proven to be associated with obtaining an HIV test, even after the Bonferroni correction was used. In addition, age, race, sex, and homelessness were proven to be potential factors of substance use and obtaining an HIV test among bipolar individuals, but marital status and employment were not found to be potential factors of substance use and HIV testing among bipolar individuals.

I failed to reject $H_0$6, which combined all the independent variables: having a bipolar diagnosis, high risk behaviors, inability or can't afford treatment (such as drug prescriptions, counseling or therapy), non-adherence to treatment for bipolar, and substance use were associated with obtaining an HIV test. However, after using the Bonferroni correction, substance use was not associated with obtaining an HIV test. All other four variables (having a bipolar diagnosis, high risk behaviors, inability to afford treatment, and non-adherence to treatment) were associated with HIV testing. Interestingly, after entering the demographic variables into the multiple logistic hierarchical models, only high risk behaviors, non-adherence to treatment, age, race, sex, and homelessness were found to be significant.

Therefore, I failed to reject the null hypothesis that stated that all five independent variables (having a bipolar diagnosis, high risk behaviors, inability to afford treatment, non-adherence to treatment, and substance use) were not potential factors of obtaining and HIV testing. When combining all five independent variables together into one model, only non-adherence to treatment and high risk behaviors were found to be predictors of HIV testing. For the demographic variables, only sex, race, and homelessness were shown to be confounding factor of HIV testing. Although in previous analyses age was found to be a factor, employment and marital status did not make a difference among bipolar individuals to obtain an HIV test.

In Chapter 5, I provide an interpretation of the findings, limitations of the study, recommendations, implications for social change, and recommendation for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

Mental illness continues to be a serious public health issue and its prevalence has increased in the past decade (CDC, 2011). Most previous studies have focused mainly on mental illness as a whole, but not singularly on BPD (BPD), which affects 5.7 million American adults (or about 2-6% of the population age 18 and older) have BPD (APA, 1994; CDC, 2011; WHO, 2008). Several researchers have reported that the rate of HIV infection remains excessively high among those who are mentally ill, mostly among individuals diagnosed with BPD. This problem is often attributed to high risk sexual behaviors, drug injection, needle sharing or paraphernalia, and the low frequency (less than 50%) of HIV testing undergone among individuals diagnosed with some form of mental illness (Desai & Rosenheck, 2004; Meade & Sikkema, 2005a, 2005b, 2007; Meade & Weiss, 2007; McKinnon et al., 2002; Rosenberg et al., 2001; Senn & Carey, 2008). Little research, however, has been conducted on the relationship between the independent variables: having a bipolar diagnosis, high risk behaviors, inability to afford treatment, non-adherence to treatment for BPD, and the outcome variable, HIV testing.

The purpose of this study was to examine the association between the following independent variables: having a bipolar diagnosis, high risk behaviors (as defined by sex exchanged for monetary gain, men having sex with other men, having sex with an infected partner), inability to afford treatment, non-adherence to treatment for BPD, substance abuse other than alcohol and tobacco, and HIV testing among BPD individuals. In this study, I also sought to determine whether demographics such as age, race,

gender/sex, employment, marital status, and homelessness status were confounding factors of HIV testing among individuals diagnosed with BPD.

There was a significant association between having a bipolar diagnosis and obtaining an HIV testing. In addition, significant associations were found between having an HIV test and demographic variables: age, gender/sex, race, homelessness, and having a bipolar diagnosis. Significant relationship was also found between high-risk behaviors (defined as participating in at least one of the following activities: sex exchanged for monetary gain, men having sex with other men, having sex with an infected partner). Demographic variables were shown to be significant confounding factors of HIV testing and high-risk behaviors included (age, homelessness, sex, and race).

The result of the binary logistic regression for the independent variable inability to afford treatment for mental health (such as prescription, therapy, or counseling) showed a significant association with obtaining an HIV test. Additionally, the multiple logistic regressions showed that the demographic variables such race, sex, marital status, and homelessness were confounding factors of obtaining an HIV test among bipolar individuals with high-risk behaviors. Significant associations were found between non-adherence to treatment for bipolar and HIV testing. For the demographic variables, only race, sex, and homelessness were also found to be confounding factors of HIV testing among bipolar individuals with non-adherence to treatment.

The study findings supported the association between the independent variable, substance abuse other than alcohol and HIV testing. The result of the multiple logistic regressions indicated that the demographic variables (race, sex, and homelessness) were

confounding factors of HIV testing among bipolar individuals who used substances. All significant independent variables were entered into the model to determine if they formed a model together. The findings of the hierarchical logistic regressions indicated that no statistical significance existed among all the five independent variables, while individually the five independent variables were shown to be predictors of HIV testing among bipolar individuals. When entered into the model along with the five independent variables, the demographic variables were not found to be confounding factors of HIV testing, as well.

Interpretation of the Findings

Key Finding 1

The first key finding indicates that having a BPD is a significant predictor of ever having had an HIV test. For the demographic variable, multiple logistic regressions was conducted, and the results showed that having an HIV test was related to gender, having a bipolar diagnosis, age, homelessness, race, and more females were likely to being tested for HIV. The demographic variables employment and marital status were not predictors of having an HIV test. After the Bonferroni correction, sex, race, homelessness, marital status, and BPD were shown to be a predictor. Meanwhile, age was not a confounding factor in the second analysis. The findings are consistent with Thompson et al. (1997) who suggested that people with BPD had a lower rate of HIV testing, then those with schizophrenia. Therefore, this study finding coincided with previous life study's findings, and practitioners working with BPD should work closely with clinicians to

increase awareness on the importance of HIV testing. This is important because HIV testing means adding more knowledge about HIV infection.

In the study conducted by Meade and Sikkema (2005), the demographic variables age, ethnicity, race, marital status, income and education level, and homelessness were found to be associated with low testing rate of HIV among bipolar individuals. This study finding did not support an association between age, employment, marital status, and HIV testing among bipolar individuals. BPD was found to be higher among the youths, Native American, unmarried, “widowed," and low-income people (Brown et al., 2010; Meade et al., 2011). When income and education level was adjusted for being potential covariates to determine whether higher education made a difference in gender behavior, the results indicated that HIV testing rate was lower among females than males. The belief was that higher education did not influence the women’s attitude toward getting tested for HIV (Senn & Carey, 2009), which differed with this study findings that shown a higher HIV testing among females than the male counterparts.

This study finding did not support the following study conducted by Collins et al. (2006), who argued that low-income and unemployment were predictors associated with BPD toward HIV testing. BPD was also suggested to be the “sixth leading” factor related to disability, and most bipolar individuals relied on social security benefits to care for themselves and their families. These studies also revealed that people with BPD had a low or no income, difficulty with securing housing, and were often estranged from family members who could provide financial assistance (Baldessarini et al., 2008; Ellinson et al., 2007; Piterman et al., 2010;Thomas et al., 2008). However, higher-income levels were

found among older individuals with BPD (Sajatovic et al., 2007). As the research documented, BPD has prevented many people from being fully functioning or productive members of their communities (Berk et al., 2010).

Melo et al. (2010) reported that globally people with mental illnesses were ill-informed about HIV risk factors. Increasing education regarding HIV risk factors and HIV testing was supported by Meade and Sikkema (2005) in their concluding statement because many of their study participants had no history of HIV testing. The authors did not analyze education as a covariate of HIV testing among bipolar individuals. They only assessed demographic such as (race, age, gender, income status, marital status, and homelessness). However, this finding supported the Epi Triangle model's third level, environmental factors (SES, whether individuals were born into poor conditions) that predispose the host to being infected.

This study finding differed from Senn and Carey (2009) who reported that age, race, ethnicity, and education level were not related with HIV testing among individuals with BPD or other mental illnesses. The result of the study revealed that race was significantly associated with HIV testing among bipolar individuals. Carey and Kalichman (1997) noted that past study results have been inconclusive regarding gender association and HIV testing rate; therefore, further research is needed to determine whether an association exists.

This study supported the findings of Folsom et al. (2005) who reported that homelessness was related with HIV testing among people diagnosed with BPD. Additionally, men of African descent were reported to have a higher rate of homelessness

than other ethnic men, due to higher drug use, lack of insurance coverage, and functional impairment. Meanwhile, Hispanics and Asian men had a lower rate of homelessness (Folsom et al., 2005). The above study was conducted in San Diego County, with the purpose of examining factors related to homelessness among BPD individuals and other mental illnesses.

The Epidemiologic Triangle or the Triad has been used by epidemiologists in past research to explain possible associations between elements (agent, environment, and the host) involved in the prevalence of infectious disease and mental illnesses (CDC, 2012; Kebede, 2004; Russell, 2010). The epidemiology framework is based on the idea that transmission of disease occurs due to contact between the host and agent, and the host's predisposition to environmental factors (Russell, 2010). Within the conceptual framework of my study, the agent is referred to HIV. The host is designated as individuals with BPD who have HIV, and the environment refers to external factors that can affect the agent. These factors can be age, race, gender/sex, income status, marital status, and homelessness, all of which could cause the spread of the infection.

The study findings are consistent with the variables of the Triad framework (agent, host, and the environment). Statistical significance was found between the hosts, bipolar individuals, the agent, HIV/HIV testing, and the environment, race, sex, and homelessness. All these variables were associated with obtaining an HIV test among individuals with bipolar. However, environmental factors (external and demographics) such as income level, marital status, and age did not seem to be factors related to HIV testing among BPD individuals.

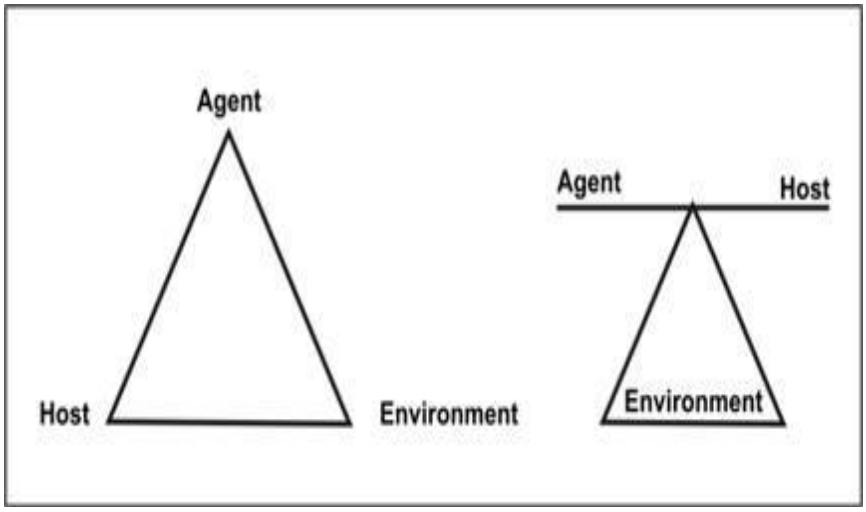

Figure 3. Epidemiology triangle model. Adapted by CDC, 2009.
This figure displays the epi triangle or triad. Agent = HIV infection, Host = individuals with BPD, Environment = demographic factors, socioeconomic, and homelessness such as living in the street or poor conditions that predispose the host to be infected by the HIV virus.

Key Finding 2

The study findings revealed that the high risk behaviors (defined as participating in at least one of the following activities: sex exchanged for monetary gain, men having sex with other men, having sex with an infected partner) were associated with obtaining an HIV test among bipolar individuals. The study findings supported Meade and Sikkema (2005) who noted that mentally ill people specifically those with BPD, were more often engaged in high-risk behaviors for HIV infection, and were less likely to get tested for HIV. Additionally, BPD was reported to be associated with high-risk behaviors and high sexual activities that consisted of having many sex partners, unprotected sex, and sex exchanged for money (Carey et al., 1997a; Cournos et al.,1991a; Desai & Rosenheck, 2004; Empfield et al.,1993; Hariri et al., 2011; Lee et al.,1992; Marlow et al., 2006; Martinowich et al., 2009; Meade & Sikkema, 2005a; Meyer et

al.,1993; Rosenberg et al., 2001a; Senn & Carey, 2009; Thompson et al., 1997). Individuals diagnosed with BPD also use drugs as a coping method to relieve their depression (Cournos et al., 1991; Marlow et al., 2006; Volavka et al., 1991; Wainberg et al., 2008). Other researchers also revealed that the rate of HIV remained excessively high among mentally ill people (mostly BPD) due to high-risk sexual activities, and drug injection (Carey et al., 1997a; Cournos et al., 1991a; Desai & Rosenheck, 2004; Empfield et al., 1993; Hariri et al., 2011; Lee et al., 1992; Marlow et al., 2006; Martinowich et al., 2009; Meade & Sikkema, 2005a; Meyer et al.,1993; Rosenberg et al., 2001a; Senn & Carey, 2009;Thompson et al., 1997). They also showed that less than 50% of the individuals with mental illness undergoing testing for HIV (Meade & Sikkema, 2005a, 2005b, 2007; McKinnon et al., 2002; Meade & Sikkema, 2007; Senn & Carey, 2008). This significant association between having a bipolar diagnosis, high-risk behaviors, and HIV testing symbolized all three level of the epidemiology triangle in the study.

The multiple logistic regressions revealed that demographic such as homelessness, sex, and race were associated with HIV testing among bipolar individuals with high- risk behaviors. While marital status, age, and income were not potential confounders of HIV testing among high-risk behaviors individuals with BPD. The study finding is consistent with previous research findings. For instance, Rosenberg et al. (2001) reported that there was no significant association between marital status and high-risk behaviors among individuals with BPD. Other researchers also suggested that unmarried individuals diagnosed with BPD were at risk of getting HIV due to high-risk sexual behaviors (Brown et al., 2009; Hariri et al., 2011; Loue et al., 2011; Marlow et al.,2006;

Martinowich et al., 2009). On the other hand, Ellinson et al. (2007) indicated that people diagnosed with BPD were more often married. When it comes to factors such as age, education, income, marital status, and race previous study findings have been inconsistent regarding these issues.

The epidemiology triangle framework stated that the transmission of disease occurs due the host's predisposition to environmental factors (Russell, 2010). In this study, BPD as the host is proven to be influenced by strong environmental demographic factors (like race, gender/sex, and homelessness). Factors such as being married, having an income, or whether young and old did not influence HIV testing. In addition, having shelter, racial background, and sex/gender are demonstrated to be the leading cause that predisposed bipolar individuals with high-risk behaviors not to obtain an HIV test, even though they are at higher risk of being infected by the HIV virus.

Key Findings 3

The inability to afford treatment such as drug prescriptions or therapy/counseling is associated with the outcome variable, HIV testing among bipolar individuals. This study finding supported other research findings such as (Berk et al., 2010, Berk and Castle, 2004, 2010, and Piterman et al., 2010) that suggested not being able to afford treatment indicated that patients had difficulty accessing treatment or paying for medications prescribed by their physicians. Therefore, the individuals decided to discontinue treatment, which included missing their doctors' appointments, not refilling their prescriptions, and avoiding any contact with their treatment team. In this situation, the action was either voluntary or involuntary. In this case, the third level of the Epi

triangle, environment can impact whether bipolar individuals seek or continue with treatment, which is associated with not obtaining HIV testing.

Researchers have demonstrated that the ability to afford and adhere to treatment for BPD decreased the frequency of manic episodes, decreasing engagement in associated high-risk behaviors (Michalak et al., 2011; Perlick et al., 2001). Not having the ability to purchase prescribed drugs, was shown to be related with unhealthy behavior among many patients who used different method of coping (strategies for dealing with their illnesses) unintentionally, which many times associated with utilizing drugs and alcohol. This behavior was linked mostly to individuals with BPD (Baldessarini et al., 2008; Basco & Smith, 2009; Berk & Castle, 2004; Berk et al., 2010; Colom & Vieta, 2002; Gaudiano et al., 2008; Sajatovic et al., 2007).

According to Cruz et al. (2011), inability to afford or adhere to treatment was also associated with high mortality rate from suicide among individuals with BPD. Inability to afford treatment was proposed to be problematic, and managing the illness without treatment regimen prescribed by physicians was much more difficult (Basco & Smith, 2009). The multiple logistic regressions findings indicated that the demographic variables (race, sex, homelessness, and marital status), and the independent variable, inability to afford treatment (drug prescriptions, therapy or counseling), were associated with HIV testing among bipolar individuals. After the Bonferroni correction, all four demographic variables remained significant with HIV testing among bipolar individuals who could not afford treatment.

The Epi triangle framework environmental factors played a great role regarding the impact of race, sex, marital status, and homelessness upon having an HIV test among bipolar individuals who had no ability to afford treatment. Therefore, practitioners working with BPD should work closely with clinicians to add knowledge on the significance of HIV testing.

Key finding 4

Non-adherence to treatment for BPD was related to obtaining an HIV test. As demonstrated by other researchers, treatment adherence among psychiatric patients was related to a higher rate of HIV testing (Berk & Castle, 2004; Berk et al., 2010; Colom & Vieta, 2002; Sajatovic et al., 2007). People who were highly supported by family and friends, or had frequent relapses and hospitalizations showed a high proportion of HIV testing during their illnesses (Desai et al., 2007; Melo et al., 2010; Meade & Sikkema, 2005; Senn & Carey, 2009; Thompson et al., 1997). The multiple logistic regressions result indicated that non-adherence to treatment for bipolar and demographic variables (race, gender/sex, marital status, and homelessness) were associated with obtaining an HIV test among bipolar individuals. However, after using the Bonferroni correction, only race, gender, and homelessness remained statistically significant and associated to HIV testing among bipolar individuals with non-adherence to treatment for BPD. Again age (young or old), being married, and employed did not have any impact upon HIV testing among bipolar individuals.

The finding differed from Berk et al. (2010) who reported gender was not related with non-adherence to treatment among individuals with BPD. On the other hand, a

significant association was found for age, race, ethnicity, marital status, homelessness, and substance use. The older and married individuals with BPD people were more adherent to their treatment, while the younger individuals with BPD were mostly non-adherent to their treatment, substance users, non-married, unemployed, and homeless (Berk et al., 2010, Sajatovic et al., 2007).

There has been conflicting evidence regarding age and treatment adherence among individuals with BPD. For instance, Sajatovic et al. (2007) reported that older individuals with BPD showed adherence to medications, but their study was limited to BPD veterans only. Busby and Sajatovic (2010) revealed that older individuals with BPD had higher medication adherence than the younger ones. However, in the discussion section, Busby and Sajatovic pointed out that there were limitations in the study's analysis, and deemed that their results were inconclusive. Sajatovic et al. (2007) indicated that most individuals with BPD lack understanding about the severity of their illness, as well as, the benefit of the treatment regimen prescribed by their physicians.

Therefore, they suggested enhancing "psychoeducational interventions" (planning or developing strategies to educate individuals with BPD of the benefit of medication adherence; p. 181) will increase medication adherence. Providing education about the individuals' illness and benefit of long-term treatment enables them to make an informed decision on their treatment outcomes.

The association between non-adherence to HIV testing among bipolar individuals was consistent with all three level of the Epi triangle framework of the study. Environmental factors such as demographic (race, sex, and homelessness) did affect

whether bipolar individuals tested for HIV. Practitioner and clinician working with BPD individuals should use these life study findings to increase knowledge of the importance of HIV testing.

Key Finding 5

The study findings showed that the independent variable of substance abuse other than alcohol was associated with obtaining an HIV test among bipolar individuals. This finding is supported by Meade et al. (2010) who showed illegal substance use had increased the rate of HIV by three times among individuals with BPD. In addition, 50% of patients with BPD were drug users. Drug usage was also shown to be a predictor for HIV infection spread.

The multiple logistic regressions finding indicated that substance abuse was related to age, sex, race, homelessness, and marital status with HIV testing among BPDs. After using the Bonferroni correction, only race, sex, homelessness, and marital status remained significant. Interestingly, employment and age was not associated with HIV testing among bipolar individuals with substance abuse. In this case, the demographic variables (race, sex, homelessness, and marital status) represented the third level of the Epi triangle framework in the study. While employment and age were not a factor of obtaining an HIV test among bipolar individuals with substance abuse.

Key Findings 6

The study finding for the independent variables having a bipolar diagnosis, high risk behaviors, inability to afford treatment (such as drug prescriptions, therapy, and counseling), non-adherence to treatment for BPD, and substance use were not predictors

of with HIV testing among bipolar individuals. All the independent variables were entered as one model to assess the association. Also a hierarchical multiple logistic regressions were used to enter the demographic variables one by one. In the first model, having a bipolar diagnosis, high risk behaviors, inability to afford treatment such as (drug prescriptions, therapy/counseling), non-adherence to treatment for bipolar, and substance abuse was statistically significant. All five independent variables (having a bipolar diagnosis, high-risk behaviors, inability to afford treatment, non-adherence to treatment for bipolar, and substance abuse) were shown to be associated with HIV testing when analyzed individually; however, when they were entered together as one model, the result differed.

However, after the Bonferroni correction, only non-adherence to treatment for bipolar, high risk behaviors, race, homelessness, and sex remained significant. Even though several variables revealed a relationship or association with HIV testing in the study finding, the strongest related variables described all three level of the epidemiology triangle framework in the study. These variables included non-adherence to treatment for bipolar, high-risk behaviors, and demographic (race, sex, and homelessness). The outcome of the study emphasizes the significance of the diverse types of effects of environmental factors (race, sex, and homelessness), high-risk behaviors, and non-adherence to treatment upon obtaining an HIV test among bipolar individuals. The social factors such as having a job/income, marital status, and age did not seem to be significant confounders of HIV testing among bipolar individuals.

The study finding supported Folsom et al. (2005) that reported racial background was associated with bipolar individuals who engaged in high-risk sexual behavior and substance use. African American males were more at risk of homelessness than other male minorities. Meade et al. (2008) indicated that individuals with BPD addicted to cocaine showed significant risk of sex exchanged for money. The need for drugs was more important than protection against infection. By not having any money to satisfy their desire, BPD individuals engaged in trading sex for monetary gain. Similar sexual risk behaviors were shown among individuals with BPD in the study conducted by Meade et al. (2011). They reported that the illegal substance use had increased the rate of HIV by three times among individuals with BPD. Substance-use was also reported as being associated with high-risk sexual behavior in a Brazilian study conducted by Elkington et al. (2010). This study supported the utilization of the Epi triangle framework view on the relationship between the agent, host, and environmental upon disease transmission.

The findings of this study mean that BPD individuals are at risk of being infected with the HIV virus due to high-risk behaviors, inability to afford treatment, non-adherence to treatment for BPD, substance abuse, and not obtaining HIV testing. This study corroborated previous studies that reported significant association between the independent variables discussed above, and the outcome variable. Therefore, these findings should be used among practitioners and clinicians working with BPD individuals to enhance awareness of the importance of HIV testing, which would decrease or reduce HIV spread.

Limitations of the Study

The outcomes of this study included several limitations. Data from a cross-sectional correlational study design do not prove cause and effect. Another limitation of the study involved external validity due to the utilization of a convenience, or non-random sample technique. If the NHIS sample was randomly chosen, external validity would have increased, which would provide better inference on the population generalizability. However, the use of a convenience sample, or a complex multistage technique to gather the data decreased the confidence level for making inference on whether the NHIS sample was representative of all bipolar individuals and generalized form the sample to the population. Additionally, the results of this secondary analysis might have generalizability problem due to the nature of the study being self-reported, which can cause a lack of validity of the data.

Recommendation for Action

Due to the quantitative methodology and tools utilized to assess the variables in the study, more in-depth assessment or investigation of the causes or reasons bipolar individuals did not adhere to treatment or could not afford prescriptions was not possible. Therefore, further research should include a qualitative methodology to examine individuals' perceptions, attitudes, beliefs, and stigma associated with adherence to treatment for BPD and obtaining an HIV test. Using a qualitative method for future research on non-adherence and inability to afford treatment among bipolar individuals will enable researchers to develop more understanding on this subject.

There is a need for increased education on the benefits of HIV testing to reduce the spread or transmission of the virus among bipolar individuals. Also, additional education is needed on the importance of adherence to treatment among bipolar individuals, their families, and support persons involved in their mental health care. Public health professionals are encouraged to carry informed consent along with the HIV rapid or in-home test in their mobile outreach health services to increase HIV testing. Other possible educational outreach includes increasing distribution of pamphlets and brochure regarding risk factors associated with non-adherence to treatment and inability to afford treatment. Recommendations also include increased knowledge on the impact of environmental factors such as demographic (race, sex/gender) and social factors (employment, and homelessness or living in poor conditions) upon bipolar individuals for being tested for HIV. This action would probably bridge the gap that existed in a lack of awareness of HIV testing among bipolar individuals.

Implications for Social Change

The findings of this study provide evidence regarding the association between the several variables and HIV testing among bipolar individuals. The study findings can be a significant step toward understanding the enormity of HIV spread among BPD individuals and factors influenced their behaviors. Possible positive social change includes increasing the body of knowledge necessary to improve education among bipolar individuals. It also includes increasing awareness on high-risk behaviors, non-adherence to treatment for BPD, inability to afford treatment, substance abuse and their consequences. Having a better understanding of the benefits of HIV and early treatment

and medical interventions may improve testing and the quality of life among people with BPD and save lives.

Conclusion

BPD is a serious mental illness that causes a shift in the individual's brain, or changes in their moods (CDC, 2011). BPD affects 5.7 million American adults, or about 4% of the population (APA, 1994; CDC, 2011; WHO, 2008). Based on my study findings, having BPD, engaging in high-risk behaviors (as defined by having different sex partners, unprotected sex, and sex exchanged for money), inability to afford treatment (such as prescribed drugs, therapy or counseling), non-adherence to treatment for BPD, and substance use other than alcohol are significantly associated with HIV testing. BPD individuals were shown to have a greater number of absentee days from work, and were less productive than those with other mental health disorders a method of coping for relieving symptoms of depression (CDC, 2011; Marlow et al., 2006; Wainberg et al., 2008).

Other study findings revealed that the treatment for BPD has been proven effective in BPD recovery processes (Sajatovic et al., 2007). In addition, having access to treatment facilities, and the ability to purchase prescriptions were reported to be associated with increased functioning among individuals with BPD (Sajatovic et al., 2007). Adherence to treatment for BPD is also reported to increasing recovery and prevents relapse, hospitalization, and drug use as a coping method for symptoms of BPD (Baldessarini et al., 2008; Basco & Smith, 2009; Sajatovic et al., 2007). The study findings also revealed that demographics (such as race, age, sex, marital status,

employment, and homelessness) were potential covariates or confounding factors with HIV testing among bipolar individuals.

These findings demonstrated that there is a need to understand why BPD individuals do not get tested for HIV. It was reported that over 60% of people diagnosed with BPD do not adhere to their treatment (Gaudiano et al., 2008). Non-adherence to treatment remained a problem among individuals diagnosed with Bipolar as it results in high-risk behaviors, which leads to HIV infection (Gaudiano et al., 2008). During the manic phase, these people engaged in high-risk sexual encounters, and high-risk behaviors were reported to be associated with HIV infection among individuals with BPD (Brown et al., 2010; Meade et al., 2008). Baldessarini et al. (2008), reported that BPD was found to be associated with "high levels of long-term morbidity, comorbidity, hospitalization, disability, increase in mortality rates resulting from suicide accidents, and adverse outcomes of comorbid substance use and medical illnesses" (p. 95). Cruz et al. (2011) noted that non-adherence to treatment for BPD was 20-60% for all BPD individuals. Therefore, awareness of the severity of BPD, and the importance of treatment adherence for the illness should be increased in order to prevent reoccurrence of crisis situations.

The results of my study along with my empirical knowledge confirm that BPD individuals during the manic phase are involved in high-risk behaviors and substance use due to non-adherence to their treatment, or inability to afford prescribed drugs, therapy/counseling; thus, BPD individuals are at risk of being infected with the HIV infection. These individuals should be counseled on the risks of HIV infection and

encouraged to be tested for HIV. For HIV effectiveness, we as health care professionals need to identify the seriousness of the manic episodes, as well as, the mood swings, that can impair BPD individuals' judgment, ability to think, or make sound decisions, which can be detrimental to their well being. As mental or medical healthcare practitioners, especially those of us working with BPD individuals need to understand the importance of HIV testing, so we can improve the quality of life and save lives of those we serve.

References

Aagaard, J., Vestergaard, P., Maarbjerg, K. (1988). Adherence to lithium prophylaxis: II. Multivariate analysis of clinical, social, and psychosocial predictors of non-adherence. *Pharmacopsychiatry*, *21*, 166-170. doi.org/10.1055/s-2007-1014670

Aagaard, J. Vestergaard, P. (1990). Predictors of outcome in prophylactic lithium treatment: A 2-year prospective study. *Journal Affective Disorder, 18*(4), 259-266. Doi.org/10.1016/0165-0327 (90)90077-L

Adekeye, O. A, Heiman, H. J., Onyeabor, O. S, & Hyacinth, H. I. (2012). The new invincible: IV screening among older adults in the. *U.S. Plos One, 7*(8), e43618 doi:10.1371/journal.pone.0043618

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Baldessarini, R., Henk, H., Sklar, A., Chang, J., & Leahy, L. (2008). Psychotropic medications for patients with BPD in United States: Polytherapy and adherence. *Psychiatric Service, 59*, 1173-1183. doi.org/10.1176/appi.ps.59.10.1175

Bakare, M. O., Agomoh, A. O., Ebigbo, P. O., Onyeama, G. M., Eaton, J., Onwukwe, J. U., & Okonkwo, K. O. (2009). Co-morbid disorders and sexual risk behavior in Nigerian adolescents with BPD. *International Archive Medicine, 2*, 16. doi: 10.1186/1755-7682-2-16.

Basco, M. R. & Smith, J. (2009). Faulty decision-making: Impact on treatment adherence in BPD. *Primary Psychiatry*, *16*(8), 53-58. Retrieved from http://www.primarypsychiatry.com/default.aspx

Berk, M., Berk, L., & Castle, D. (2004). A collaborative approach to the treatment alliance in BPD. *Blackwell Munksgaard, 6*, 504-518. doi.org/10.1111/j.1399-5618.2004.00154.x

Berk, L., Hallam, K.T., Colom, F., Vieta, E., Hasty, M., Macneil, C., & Berk, M. (2010). Enhancing medication adherence in patients with BPD. *HumanPsychopharmacology Clinical Experiment, 25*, 1-16. doi: 10.1002/hup.1081

Beyer, J.L., Taylor, L., Gersing, K.R., & Krishnan, K. R. (2007). Prevalence of HIV infection in a general psychiatric outpatient population. *Psychosomatics*, *48*, 31–37. doi.org/10.1176/appi.psy.48.1.31

Bierman, A. S. & Bubolz.(n.d). *Chapter 20: Secondary analysis of a large survey database*. Retrieved from http://painconsortium.nih.gov/symptomresearch/chapter_20/sec23/cabs23pg1.htm

Blumberg, S. J., & Dickey, W.C. (2003). Prevalence of HIV risk behaviors, risk perceptions, and testing among US adults with mental disorders. *Journal of Acquired Immune Deficiency Syndromes, 32*, 77–79. doi.org/10.1097/00126334-200301010-00011

Brown, A., Lubman, D.I., & Paxton, S. (2010). Sexual risk behaviour in young people with first episode psychosis. *Early Intervention in Psychiatry, 4*, 234-242. doi:10.1111/j.1751-7893.2010.00172.x

Busby, K.K., & Sajatovic, M. (2010). Patient, Treatment, and Systems-Level Factors in BPD Nonadherence: A summary of the literature. *CNS Neuroscience & Therapeutics*. *16,* 308-315. doi.org/10.1111/j.1755-5949.2010.00191.x

Carey, M.P., Carey, K.B. & Kalichman, S.C. (1997a). Risk for Human immunodeficiency virus (HIV) infection among persons with severe mental illnesses. *Clinical Psychology Revision, 17*, 271-291. doi.org/10.1016/S0272-7358 (97)00019-6

Carey, M. P., Carey, K. B., Maisto, S.A., Schroder, K. E.E, Vanable, P.A., Gordon, C.M. (2004). HIV risk behavior among psychiatric outpatients: association with psychiatric disorder. Substance use disorder and gender. *Journal of Nervous Mental Disorder, 192*, 289–296. doi.org/10.1097/01.nmd.0000120888.45094.38

Centers for Disease Control and Prevention. (2003a). Advancing HIV prevention: New strategies for a Changing Epidemic. *Morbidity and Mortality Weekly Report*, *52*,329-332. Retrieved from http://www.cdc.gov/nceh/ehs/ehsnet/default.htm

Centers for Disease Control and Prevention. (2003b). HIV/AIDS special surveillance report: HIV Testing Survey, 2000. US Department of Health and Human Services: Atlanta, GA. Retrieved from http://www.hhs.gov/

Centers for Disease Control and Prevention. (2009a). Environmental health services. Retrieved from http://www.cdc.gov/nceh/ehs/ehsnet/default.htm

Centers for Disease Control and Prevention (2009b). The National Health and Nutrition Examination Survey (NHANES) and National Health Interview Survey.

Retrieved from

http://www.cdc.gov/nchs/nhis/quest_data_related_1997_forward.htm

Centers for Disease Control and Prevention (2011a). CDC Report: Mental Illness surveillance among U.S. adults. *Morbidity and Mortality Weekly Report, Vol. 60.* Retrieved from *http://www.cdc.gov/mentalhealthsurveillance/*

Centers for Disease Control and Prevention (2011b). Mental Illness Surveillance. Retrieved

from www.cdc.gov/mentalhealthsurveillance/sources.html

Centers for Disease Control and Prevention (2012a). Estimated HIV incidence in the United States, 2007–2010. HIV Surveillance Supplemental Report 2012, *17, 4*. Retrieved from http://www.cdc.gov/hiv/surveillance resources/reports/2010supp vol. 17, 4

Centers for Disease Control and Prevention (2012b). HIV Surveillance Report, 2010; vol. 22. Retrieved from

http://www.cdc.gov/hiv/library/reports/surveillance/2011/surveillance_Report_vol_23.html

Centers for Disease Control and Prevention (2012c). HIV Home Tests. Retrieved for http://www.cdc.gov/hiv/testing/lab/hometests.html

Centers for Disease Control and Prevention. (2012d). Monitoring selected national HIV prevention and are objectives by using HIV surveillance data—United States and 6 U.S. dependent areas—2010. HIV Surveillance Supplemental Report 2012;

17(No. 3, part A). Retrieved from http://www.ced.gov/hiv/pdf/statistics 2010 HIV Surveillance Report vol *17*, 3

Centers for Disease Control and Prevention (2012e). Principles of Epidemiology in Public Health Practice, 3rd Edition. Retrieved from http://www.cdc.gov/osels/scientific_edu/ss1978/lesson1/Section8.html

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Retrieved from http://www.interaction-design.org/references/publishers/lawrence_erlbaum_associates.html

Collins, P. Y., von Unger, H., & Ambrister, A. (2008). Church Ladies, good girls, and locas: Stigma and the intersection of gender, ethnicity, mental illness, and sexuality in relation to HIV risk. *Social Science Medicine*, *67*(3), 389-397. doi: 10.1016/j.socscimed.2008.03.013

Collins, P.Y., Sweetland, A., Zybert, P. (2007). 160th Annual Meeting of the American Psychiatric Association. San Diego: How dangerous is stigma? Stigma and HIV risk among women with mental illness. Retrieved from http://www.mdconferencexpress.com/Meeting.aspx?cid=08e1e133-2f19-4dc4-a28e-65005655a73e

Colom, F., Vieta, E. (2002). Treatment adherence in bipolar patients. *Clinical Approaches BPD*, *1*, 49-56. Retrieved from http://gulib.georgetown.edu/newjour/c/msg03721.html

Cournos, F., Empfield, M., Horwath, E., McKinnon, K., Meyer, I., Schrage, H. …Agosin, B. (1991a). HIV seroprevalence among patients admitted to two psychiatric

hospitals. *American Journal of Psychiatry, 148,* 1225-1230. Retrieved from http://ajp.psychiatryonline.org/journal.aspx?journalid=13

Cournos, F., Empfield, M., McKinnon, K., Weinstock, A., Horwath, E., Meyer, I., & Currie, C. (1991b). HIV seroprevalence and risk behaviors among homeless and hospitalized mentally ill. In: *Abstracts, VII International Conference on AIDS*. Rome: Instituto Superiore di Sanita. Retrieved from http://www.icaap7.jp/

Cournos, F. & McKinnon, K. (1997). HIV seroprevalence among people with severe mental illness in the United States: a critical review. *Clinical Psychology Review,* 17, 259–269. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/9160176

Creswell, J. W. (2009). Research design: Qualitative, Quantitative, and Mixed Methods Approach (3rd ed.). Thousand Oaks, CA: *Sage Publications, Inc*

Cruz, L. P., Miranda, P. M., Vedena, K.G. G., Miasso, A. I. (2011). Medication Therapy: adherence, knowledge and difficulties of elderly people from BPD. *Rev.Latino-Am. Enfermagem, 19* (4), 944-52. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/21876947

Desai, M. M., Rosenheck, R. A. (2004). HIV testing and receipt of test results among homeless persons with serious mental illness. *American Journal of Psychiatry, 161*, 2287–2294. Retrieved from http://ajp.psychiatryonline.org

Desai, M., Rosenheck, R. A., Desai, R. A. (2007). Prevalence and correlates of humanimmunodeficiency virus testing and posttest counseling among outpatients with serious mental illness. *Journal of Nervous and Mental Disease, 195*,776–

780.

http://www.ncbi.nlm.nih.gov/pubmed/17984780?report=docsum&format=text

Elinson, L., Houck, P., Pincus, H. A. (2007). Working, Receiving, disability benefits, and access to mental health care in individuals with Bipolar Disorder. *Bipolar DisorderJournal*, *9,* 158-163. doi: 10.1111/j.1399-5618.2007.00431.x

Elkington, K. S., McKinnon, K., Mann, C. G., Colins, P.Y., Leu, C., & Wainberg, M. L (2010). Perceived Mental Illness Stigma and HIV Risk Behaviors among Adult Psychiatric Outpatients in Rio de Janeiro, Brazil. *Community Mental Health Journal, 46*, 56-64.doi 10.10007/s10597-009-9209-4

Empfield, M., Cournos, F., Meyer, I., McKinnon, K., Horwath, E., Silver, M., … Herman, R. (1993). HIV seroprevalence among homeless patients admitted to a psychiatric inpatient unit. *American Journal of Psychiatry, 150,* 47-52. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/8417579

Folsom, D. P, Hawthorne, W., Lindamer, L., Gilmer, T., Bailey, A., Golshan, S., … Jeste, D.V. (2005). Prevalence and Risk Factors for Homelessness and

Utilization of Mental Health Services among *10,* 340 Patients With Serious Mental Illness in a Large Public Mental Health System. *American Journal of Psychiatry, 162,* 2.

Frankfort-Nachmias, C., Nachmias, D. (2008). Research Methods in the Social Sciences. (7th ed.). *Worth Publishers*. New York, NY

Gaudiano, B. A., Weinstock, L. M., Miller, I.W. (2008). Improving treatment adherence in BPD: A review of current psychosocial treatment efficacy and

recommendations for future treatment development. *Sage Journals*, *32* (3), 267-301. doi: 10.1177/0145445507309023

Gerstman, B. B. (2008). *Basic Biostatistics: Statistics for Public Health Prac*tice. Jones and Bartlett Publisher. Sudbury, Massachusetts

Grant, B. F., Stinson, F.S., Hasin, D.S., Dawson, D.A., Chou, P., Ruan, W.J., Huang, B. (2005). Prevalence, correlates, and comorbidity of bipolar I disorder and Axis I and II disorders: results from the National Epidemiologic Survey on alcohol and related conditions. Journal of Clinical Psychiatry, *66,* 1205–1215. doi: 10.4088/JCP.v66n1001

Hariri, A. G., Karadag, F., Gokalp, P., Essizoglu, A. (2011). Risky Sexual Behavior among Patients in Turkey with BPD, schizophrenia, and heroin addiction. *Journal of Medicine, 8* (8), 2284-2291. doi:10.1111/j.1743-6109.2011.02282.x.

Hosmer, D., Lemeshow, S. (1989). *Applied Logistic Regression.* New York, NY. John Wiley & Sons, Inc

Hutton, H. E., Lyketsos, C. G., Zenilman, J.M., Thompson, R. E., & Erbelding, E. J. (2004). Depression and HIV Risk Behavior among Patients in a Sexually Transmitted Disease Clinic. *American Journal of Psychiatry*, *161* (5), 912-914. doi:10.1176/appi.ajp.161.5.912

Kalichman, S. C., Kelly, J. A., Johnson, J. R., & Bulto, M. (1994). Factors associated with risk for HIV infection among chronic mentally ill adults. *American Journal Psychiatry, 151*, 221-227. http://www.ncbi.nlm.nih.gov/pubmed/8296893

Kebede, Y. (2004). Epidemiology –The Carter Center. *Ethiopia Public Health.* University of Gondar. Retrieved from www.cartercenter.org/resources/pdfs/.../env.../Epidemiology

Kelly, J. A., Murphy, D. A., Bahr, G. R., Brasfield, T. L, Davis, D.R., Hauth, A.C., … Eilers, M. K. (1992). AIDS/HIV risk behavior among the chronic mentally ill. *American Journal Psychiatry,149*, 886-889.Retrieved from http:// http://www.ncbi.nlm.nih.gov/pubmed/1609866

Kessler, R. C., Chiu, T., Demler, O. & Walters, E. E. (2005). Prevalence, Severity, and Comorbidity of Twelve-month DSM-IV disorders in the National Comorbidity Survey Replication (NCS-R). *Archives of General Psychiatry*, *62*, 617-627. Retrieved from http:// http://www.ncbi.nlm.nih.gov/pubmed/15939839

Kleinbaum, D., Kupper, L. L., Muller, K. E. (1988). *Applied Regression Analysis and Other Multivariable Methods* (2nd edition). Boston, MA. *PWS-Kent*

Lee, H. K., Travin, S., & Bluestone, H. (1992). Relationship between HIV-1 antibody seropositivity and alcohol/nonintravenous drug abuse among psychiatric inpatients: A pilot study. *American Journal Addict, 1*, 85-88, 1992. doi: 10.1111/j.1521-0391.1992.tb00011.x

Levounis, P., Galanter, M., Dermatis, H., Hamowy, A. & DeLeon, G. (2002). Correlates of HIV transmission risk factors and considerations for interventions for homeless, chemically addicted and mentally ill patients. *Journal of Addictive Disease*, *21,* 61-72. doi:10.1300/J069v21n03_05

Lopez-Jaramillo, C., Lopera-Vasquez, J., Gallo, A., Ospina-Duque, J., Bell, V., Torrent, C., …Vieta, E. (2010). Effects of recurrence on the cognitive performance of patients with bipolar I disorder: implications for relapse prevention and treatment adherence. *BPD. 12,* 557-567. doi: 10.1111/j.1399-5618.2010.00835.x.

Loue, S., Sajatovic, M., Mendez, N. (2011). Substance Use and HIV Risk I a Sample of Severely Mentally Ill Puerto Rican Women. *Journal of Immigrant Minority Health, 13,* 681-689. *d*oi 10.1007/s10903-011-9452-y

Marlow, R. M., Devieux, J.G., Martinex, L., Peipman, F., Lucenko, B.A. & Kalichman, S.C. (2006). History of Traumatic Abuse and HIV Risk Behaviors in Severely Mentally Ill Substance Abusing Adults. *Journal of Family Violence*, *21,* 2. doi: 10.1007/s10896-005-9012-0

Marrow, J. A. (2008). Creating Frequency Distributions in SPSS. Laureate Educational Inc. Retrieved from http://sylvan.live.ecollege.com/ec/crs/76298?CRS-ENG-112- 6201994/RSCH8200_Fr

Martinowich, K., Schloesser, R.J., & Manji, H.K. (2009). BPD: from genes to behavior pathways. *Clinical Investigation, 119* (4), 726–736. doi:10.1172/JCI37703.

McKinnon, K., Cournos, F., Herman, R. (2002). HIV among people with chronic mental illness. *Psychiatric Quarterly, 73,* 17–31. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11780595

Meade, C. S., & Sikkema, K. J. (2005a). Voluntary HIV Testing Among Adults with Severe Mental Illness: Frequency and Associated Factors. *AIDS and Behavior, Vol. 9,* No. 4 doi: 10.1007/s10461-005-9033-y

Meade, C. S., & Sikkema, K. J. (2005b). Voluntary HIV testing among adults with severe mental illness: frequency and associated factors. *AIDS and Behavior 9,* 465–473. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/16323033

Meade, C. S.,& Sikkema, K. J. (2007). Psychiatric and psychosocial correlates of sexual risk behavior among adults with severe mental illness. *Community Mental Health Journal 43*, 153–169.Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/17143728

Meade C. S., Weiss, R.D. (2007). Substance abuse as a risk factor for HIV sexual risk behavior among persons with severe mental illness: review of evidence and exploration of mechanisms. *Clinical Psychology: Science and Practice, 14*, 23–33. doi: 10.1111/j.1468-2850.2007.00059.x

Meade, C. S., Graff, F. S., Griffin, M. L., & Weiss, R. D. (2008). HIV risk behavior among patients with co-occurring bipolar and substance use disorders: Associations with mania and drug abuse. *Drug Alcohol Depend*, *92* (1-3), 296-300. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/17850993

Medline Plus (2013). ELISA/Western blot tests for HIV. Retrieved from http://www.nlm.nih.gov/medlineplus/ency/article/003538.htm

Melo, A. P. S., Cesar, C. C., Acurcio, F. A., Campos, L. N., Ceccato, M.G.B., Wainberg, M. L.,…& Guimaraes, M. D. C. (2010). Psychiatric patients' return for HIV/STI test results in mental health centers *Community Mental Health Journal*, *46,* 505-516. Retrieved from http://www.scielo.br/pdf/rsp/v46n2/3419.pdf

Meyer, I., McKinnon, K., Cournos, F., Empfield, M., Bavli, S., Engel, D., & Weinstock, A. (1993). HIV seroprevalence among long-stay patients in a state psychiatric hospital. *Hospital Community Psychiatry, 44*, 282-284. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/8444444

Michalak, E., Livingston, J. D., Hole, R., Suto, M., Hale, S., & Haddock, C. (2011). 'It's something that I manage but it is not who I am': reflections on internalized stigma in individuals with BPD. *Chronic Illness, 0*(0), 1–16. doi: 10.1177/1742395310395959

National Institute of Mental Health (2008) (NIMH). Transforming the Understanding of Mental Illness through Research. Retrieved from http://www.nimh.nih.gov/statistics/SMI_AASR.shtml

Nies, M., & McEwen, M. (2007). *Community/Public health nursing: Promoting the health of populations.* (4th ed). Philadelphia, PA: Saunders Elsevier

Perlick, D. A., Rosenheck, R. A., Kaczynski, R., Kosma, L. (2004). Medication non-adherence in Bipolar Disorder: a patient-centered review of research findings. *Clinical Approaches Bipolar Disorder,* 3, 56-64. Retrieved from http://cat.inist.fr/?aModele=afficheN&cpsidt=16314448

Peuskens, J., Kasper, S., Arango, C., Bandinelli P. L., Gastpar, M., Keks, N., … & Vieta, E. (2007). Management of acute ill patients in the hospital settings: focus on quetiapine. *International Journal of Psychiatry in Clinical Practice, 11* (1), 61-72. Retrieved from http://informahealthcare.com/doi/abs/10.1080/13651500601168291

Piterman, L., Jones, K. M., & Castle, D. J. (2010). Bipolar Disorder in general practice: challenges and opportunities. *Medical Journal of Australia*, *193* (4), S14-S17. Retrieved from https://www.mja.com.au/journal/2010/193/4/bipolar-disorder-general-practice-challenges-and-opportunities

Royce, R. A., Sena, A., Cates, W., & Cohen, M. S. (1997). Sexual Transmission of HIV. *New England Journal Medicine, 336,* 1072-1078. doi:10.1054NEJM199704103361507

Rosenberg, S. D., Goodman, L. A., Osher, F. C., Swartz, M. S., Essock, S. M., &…Salvers, M. P. (2001a). Prevalence of HIV, hepatitis B, and hepatitis C in people with severe mental illness. *American Journal of Public Health*, *91*(1), 31-37. Retrieved from https://www.mja.com.au/journal/2010/193/4/bipolar-disorder-general-practice challenges-and-opportunities

Russell, A. L. (2010). Stethoscopes as a Source of Hospital- Acquired MRSA. Department of Honors Thesis: The University of Tennessee at Chattanooga School of Nursing

Sacks, M., Dermatis, H., Looser-Ott, S., & Perry, S. (1992). Seroprevalence of HIV and risk factors for AIDS in psychiatric inpatients. *Hospital & Community Psychiatry*, *43*, 736-737. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/1516910

Sacks, M., Dermatis, H., Burton, W., Hull, J. (1994). Acute psychiatric illness: effects on HIV-risk behavior. *Psychosocial Rehabilitation Journal, 17*, 14–19. doi: 10.1037/h0095560

Sajatovic, M., Blow, F. C., Kales, H. C., Valenstein, M., Ganoczy, D., Ignacio, R.V. (2007). Age comparison of treatment adherence with antipsychotic medications among individuals with Bipolar Disorder. *International Journal Geriatric Psychiatry*, *22* (10), 992-998. doi: 10.1002/gps.1777

Senn, T. C., & Carey, M. P. (2009). HIV testing among individuals with a severe mental illness: Review, suggestion for research, and clinical implications. *Psychological Medicine*, *39*, 355-363. doi:10.1017/S0033291708003930

Silberstein, C., Galanter, M., Marmor, M., Lifshutz, H., Krasinski, K., Franco, H. (1994). HIV-1 among inner city dually diagnosed inpatients. *American Journal Drug Alcohol Abuse, 20* (1), 101–113. Retrieved from http://informahealthcare.com/doi/abs/10.3109/00952999409084060

Smith, T. E., Levine, S. B., & Hampel, J. (2008). A Successful Effort to Improve Adherence to Treatment Guidelines for BPD. *Harvard Rev Psychiatry*. *16,* 210-213. doi:10.1080/10673220802160415

Smith, D. J., Griffiths, E., Poole, R., di Florio, A., Barnes, E., Kelly, M. J., Craddock, N., Hood, K., Simpson, S. (2011). Beating Bipolar: exploratory trial of a novel internet-based psychoeducational treatment for Bipolar Disorder. *BPD*, *13*, 571-577. doi: 10.1111/j.1399-5618.2011.00949.x

Strakowski, S. M., DelBello, M. P. (2000). The co-occurrence of bipolar and substance use disorders. *Clinical Psychology Review*, *20* (2), 191-206. doi.org/10.1016/S0272-7358(99)00025-

Substance Abuse and Mental Health Administration (2012). The National Survey on Drug Use and Health (NSDUH). Retrieved from http://www.samhsa.gov/data/NSDUH/2012SummNatFindDetTables/index.aspx

Thompson, S. C., Checkley, G. E., Hocking, J. S., Crofts, N., Mijch, A.M., Judd, F. K. (1997). HIV risk behaviour and HIV testing of psychiatric patients in Melbourne. *Australian and New Zealand Journal of Psychiatry, 31*, 566–576. Retrieved from http://informahealthcare.com/doi/abs/10.3109/00048679709065079

Volavka, J., Convitc, A., Czobore, P., Douyong, R., O'Donnellh, J., & Venturah, F. (1991). HIV seroprevalence and risk behaviors in psychiatric inpatients. *Psychiatric Research, 39,* 2, 109-114. .doi.org/10.1016/0165-1781(91)90080-9

Wainberg, M., McKinnon, K., Mattos, P. E., Mann, C. G., Pinto, D. S. et al. (2008). HIV risk behaviors among outpatients with severe mental illness in Rio de Janeiro, Brazil. *World Psychiatry*, *7,* 166-172. doi: 10.1002/j.2051-5545.2008.tb00190.x

World Health Organization. (2008). *HIV/AIDS and mental health.* Retrieved from http://apps.who.int/gb/ebwha/pdf_files/EB124/B124_6-en.pdf

Appendix: NHIS Variable and Instrument Terms

Variables	**Instrument Names**	**Variable Names**
BPD	BIPDIS	BIPDIS
High-Risk behavior	STMTRU	STMTRU
Inability to afford Treatment	AHCAFY_2	AHCAFY_2
Non-adherence to Medication	AHCSYR1	AHCSYR1
Substance Abuse	SUBABYR	SUBABYR
HIV Testing	HIVTST	HIVTST

Curriculum Vitae

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OBJECTIVE: To broaden my vocation in the public health field with an interest in working with a diverse population to continue professional growth and gaining more knowledge in the field of community services to promote social change.

Academic Experience:

2006-Present Public Health Doctoral Candidate with specialization in Epidemiology
Walden University—Summer 2014

Master of Public Health: Community Health Education
Walden University, May 2011

Master of Liberal Arts -Houston Baptist University
May 2005. Houston, Texas

Bachelors of Science in Psychology, Sociology---February 2000
Houston Baptist University. Houston, Texas

Related Public Health Experience:

August 2005--present Mental Health and Mental Retardation of Harris County

Clinical Coordinator 2005- 2012: coordinate patient treatment plan, provide referrals to social and community resources. Monitor adherence of treatment plan. Provide educational skills to patient, enhance engagement, reinforce knowledge on benefit of treatment, and prompt patient for behavioral change. Screen patient for employment readiness, teaching job skills, assessing understanding of job related requirements and educating patient on job stressors to increase performance.

Mentor/Community Development/Ambassador 2012-present: mentoring, training new employees, providing referral and linking patient to community services. Served as liaison and contact between agency/partnership.

September 2011- May 2012: Teacher--- Teach LVN student and prepare them for Nursing Examination and Licensure.

Related Experience: **Associate Teacher**
November 2003 **Alief Independent School District**
May 2005 **Spring Branch Independent School District**
Substitute Teacher-Special Education Classes.
Worked with children with various disabilities such as Autism, ADHD, LD, Mental Retardation, Emotional Conduct disorder, Behavioral and other physical, mental Emotional challenges.

September 1999-Present: L'Eglise de Dieu Haitienne Board Member:
Served as Secretary/Treasurer in managing records and Church finances.
Served as Agent of corporation for public relation and providing leadership training to members.

Certification: **EC-12 Special Ed Certification**
Being through the Alternative Certification Program and completed for the 2004 Fall Institute