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Psychosocial Determinants of Medication Adherence among HIV-Positive Individuals in Mexico City

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PSYCHOSOCIAL DETERMINANTS OF MEDICATION ADHERENCE IN HIV-POSITIVE INDIVIDUALS IN MEXICO CITY

by

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ABSTRACT

PSYCHOSOCIAL DETERMINANTS OF MEDICATION ADHERENCE IN HIV-POSITIVE
INDIVIDUALS IN MEXICO CITY

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This dissertation examined the relationships among disclosure, social support, exposure to

violence, impulsivity, depression, stressors, and medication adherence, using a correlational

design and a sequential logistic regression. The researcher used two samples of 146 from an

archival data set of participants to create two subsets of the data (Data Set 1 & Data Set 2). These

participants had been diagnosed with a mental illness and were prescribed a medication regimen

for HIV treatment at the time of intake in a specialized clinic in Mexico City. Archival data was

obtained through a demographic intake questionnaire and the use of valid and reliable

instruments adapted for the specific population: State Impulsivity Scale (SIS) and the Beck

Depression Inventory (BDI). Data analysis included descriptive statistics related to population

demographics, bivariate correlations, and a sequential logistic regression based on existing

literature on HIV/AIDS, medication adherence, and a theoretical model of stress and coping.

Results of the analyses indicated that impulsivity was found to be predictive of medication

nonadherence in Data Set 1 and exposure to violence was found to be predictive of medication

nonadherence in Data Set 2. However, since both were not found to be significant across both

subsets of the data, the variables could not be considered to robustly predict medication

nonadherence in this study.

This dissertation is dedicated to my grandmothers, Rose Marie and Victoria, and my mother Janny. Thank you for instilling in me your boundless love, a sense of independence, and an adventurous spirit.

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CHAPTER 1

INTRODUCTION TO THE STUDY

This chapter introduces the study and provides an overview of the study's purpose. The problem statement which guides the purpose of the study leads into the research questions, followed by a brief overview of the research design and proposed analysis. Finally, a list of variables and corresponding operational definitions conclude this chapter. The goal of the chapter is to provide an overview of the scope of the problem, the purpose and design of the current study, as well as operational definitions of the variables and review of the terminology relevant to field of HIV and AIDS research.

Problem Statement

Maximizing medication adherence is crucial for improving health outcomes in individuals with HIV and AIDS and is a critical aspect in efforts aimed toward the prevention and monitoring of HIV drug resistance (World Health Organization [WHO], 2017). However, research has shown that patients who are prescribed antiretroviral medications do not always adhere at optimal levels (Ingersoll, Dillingham, Reynolds, Hettema, Freeman, Hosseinbor, & Winstead-Derlega, 2014). Physicians treating patients with HIV suggest 95%-100% adherence to antiretroviral medication to hinder the replication of HIV in the bloodstream, strengthen immune functioning, lower likelihood of transmission, and decrease the chances of developing drug resistance (National Institutes of Health [NIH], 2017a; Smith, Rublein, Marcus, Brock, & Chesney, 2003). As the level of adherence decreases, the likelihood of virologic failure increases. Virologic failure occurs when medications used to treat HIV fail to suppress and sustain a person's viral load to less than 200 copies/mL (NIH, 2017b). Virologic failure and drug resistance can develop when adherence is not at optimal levels, increasing the chances that an

individual could develop and transmit new drug-resistant strains of the virus in which HIV medications may no longer be effective. Adherence to medication is influenced by a variety of factors including the medication regimen itself, the patient-provider relationship, and psychosocial, behavioral, and structural barriers (NIH, 2017). For this reason, continued research on the topic is vital to the understanding of the factors contributing to medication adherence in diverse populations to improve interventions, integrative care, and health outcomes.

For this study, medication adherence was examined in a population of HIV-positive individuals in Mexico City. While the prevalence of HIV and AIDS is lower in Mexico in comparison to other Latin American nations, there has been an increase in the amount of detected drug resistant strains of HIV in recent years signaling a significant concern for public health and medical professionals. The clinic from which the data were derived is one of the largest HIV-centered treatment facilities in Mexico and Latin America with a program targeting specialized treatment of HIV and AIDS patients who have been diagnosed with mental health disorders. Being that Mexico City is the largest metropolis in Latin America, it is an ideal setting to gain an understanding of the multitude of dynamics impacting HIV and AIDS treatment, specifically related to medication adherence. Typically thought of from a medical perspective, medication adherence is a topic most often discussed by physicians. While it is essential for physicians to be involved in the screening of medication adherence, it is also essential for the involvement of other professionals, including counselors and related mental health specialists who may be more attuned to psychosocial and mental health factors impacting the lives of patients. As Western medicine continues to move toward an integrative care model, it is crucial to create effective treatment models in HIV/AIDS-specialized clinics and treatment centers to

foster interprofessional collaboration, streamlined communication and treatment for optimized health outcomes.

Purpose of the Study

The purpose of this study was to examine the relationships among psychosocial factors, immune functioning, and medication adherence in HIV-positive individuals. The archival data set which was utilized has never been analyzed before, creating a unique opportunity to explore phenomena occurring in this population. The researcher intended to investigate these aforementioned relationships to cultivate new knowledge for the clinic in Mexico City and to contribute to ongoing research regarding medication adherence in public health. Additionally, it is the hope of both this researcher and the clinic staff that this study may highlight the need for further research on this topic as well as targeted efforts for improving medication adherence. Additionally, this study may emphasize the importance of enhanced screening for risk factors for nonadherence and improved interventions for HIV patients using integrative care models where collaboration across the health professions is the norm. Based on prior literature, the following research questions guided this study:

1. What are the relationships between CD4 counts, violence, disclosure, and social support in HIV-positive individuals?

2. To what extent do disclosure, social support, impulsivity, and exposure to violence predict medication adherence in HIV-positive individuals after controlling for depression and major stressors experienced within the past year?

Summary of Research Design

A nonexperimental, cross-sectional research design was utilized because it allowed examination of data from a specific point in time. An archival data set that was developed

between 2013-and-2016 from a specialized clinic in Mexico City was used because of the unique opportunity to add to the literature information regarding research on HIV treatment and medication adherence among persons from Latin American countries, specifically Mexico. This addresses a gap in counseling literature which lacks in research focused on HIV treatment in international settings. Previous studies on HIV-positive individuals focusing on adherence have used a variety of research designs and analyses to study factors influencing medication adherence and nonadherence among people living with HIV/AIDS. Studies reported in the literature utilized bivariate and multivariate logistic regression models, however, lacked sequential analyses to control for the influence of pre-existing psychological variables such as depression and major stressors experienced within the past year (e.g. Chandwani et al., 2012; Rotzinger et al., 2016; Weaver, Pane, Wandra, & Windiyaningsih, & Samaan, 2014). In the field of HIV/AIDS research, contradictory literature regarding psychosocial phenomena is the norm, requiring specific models to be tested within new populations in differing geographic regions, cultures, and ethnic groups. The current data set has never been analyzed and will contribute to the body of literature on people living with HIV/AIDS. To better understand the relevance of psychosocial factors in the role of medication adherence in the population of HIV-positive individuals in Mexico City, a regression analysis was most helpful since regression analyses assist in studying the relationships between several predictor variables and an explicit outcome (Heppner, Wampold, & Kivlighan, 2008). For this study, a sequential logistic regression design was utilized in which the researcher specified the order of entry of the predictor variables based on a theoretical rationale (Petrocelli, 2003; Tabachnick & Fidell, 2014). Due to information about medication adherence largely being derived from self-report, nonadherent patients are underrepresented creating an imbalance between adherent and nonadherent groups. The

researcher first ran a logistic regression using the full sample; however, due to this imbalance, two binary logistic regression analyses were conducted. Each analysis included the same group of nonadherent individuals but included a random sample of patients from the adherent group in order to provide an adequate representation of the population.

<div align="center">**Operational Definitions of Variables**</div>

The effects of six predictor variables on a binary categorical outcome variable was examined. The six predictor variables were disclosure, social support, impulsivity, exposure to violence, stressors, and depression. The outcome variable was medication adherence.

Disclosure to family. Disclosure in this study is a nominal variable with four levels defined by: a) whether or not the individual disclosed their HIV/AIDS status to family members, and b) if yes, the reaction of the family members to their disclosure (support, indifference, rejection). This information is collected as part of the initial evaluation at the clinic.

Social support. Social support in this study is a continuous variable. It is defined as the number of close friends an individual has with whom they can share anything, including HIV/AIDS-related information. This information is collected as part of the initial evaluation at the clinic.

Impulsivity. Impulsivity is a continuous variable which is measured by the State Impulsivity Scale. The scale is explained in detail in the instrumentation section of Chapter 3 (Iribarren, Jiménez-Giménez, García-de Cecilia, & Rubio-Valladolid, 2011).

Exposure to violence. Exposure to violence is a continuous variable. This variable represents the number of different types of violence an individual has experienced throughout their lifetime: psychological, economic, physical, sexual and is included as a self-reported response on the initial evaluation at the clinic.

Depression. Depression is a continuous variable. Depression is measured by an adapted version of the BDI developed and validated in Mexico (Beck, Steer, & Brown, 1996).

Stressors. Stressors is a continuous variable. Stressors are self-reported and defined by the amount of stressors, chosen from a predetermined list on the intake form, which a person has experienced within the past year: death of a family member, divorce/separation of parents, diagnosis of family member with serious chronic illness, legal problems, serious family fights, change of job, moving (Holmes & Rahe, 1967).

HIV/AIDS Terminology

Important to the study is the understanding of several relevant terms relating to the study and treatment of HIV and AIDS including the following (NIH, 2017b):

1. **HIV**: Human Immunodeficiency Virus. HIV takes over CD4 cells which are lymphocytes or white blood cells, integral parts of the body's immune system leading the body's defense against infections. HIV becomes part of the CD4 cells and forces the cell to produce thousands of copies of the virus (NIH, 2017b).

2. **AIDS**: Acquired Immunodeficiency Syndrome. AIDS is the most advanced stage of HIV infection resulting from prolonged depletion of CD4 cells which have been attacked by HIV. A diagnosis of AIDS occurs when a person with HIV has a CD4 count less than 200 cells/mm³ (NIH, 2017b).

3. **Viral Load**: The amount of HIV in a sample of blood. A goal of antiretroviral therapy (ART) is to suppress viral load to an undetectable level (NIH, 2017b).

4. **CD4**: The CD4 count is the most important laboratory guide of immune functioning and the strongest predictor of HIV progression. The CD4 count is one of the factors used to

gauge an individual's response to ART and also signals when a patient should start ART (NIH, 2017b).

5. **Antiretroviral Medication/Therapy (ART)**: The daily use of a combination of HIV medicines to treat HIV infection (NIH, 2017b).

6. **Medication Adherence:** The act of taking ART as agreed upon by patient and prescribing physician (NIH, 2017b).

7. **Drug Resistance:** Drug resistance occurs when mutations of HIV develop while a person is taking HIV medications. HIV medications previously effective for a person are no longer effective. An individual can also be infected by a drug-resistant strain of HIV (NIH, 2017b).

8. **Virologic Failure:** Virologic failure occurs when ART fails to suppress and sustain a person's viral load to less than 200 copies/mL which can result from drug resistance, drug toxicity, and poor treatment adherence (NIH, 2017b).

9. **Detectable/Undetectable:** An individual is said to be undetectable when viral load is too low to be measured. This is usually considered to be a viral load of below 50 (NIH, 2017b).

10. **MSM:** Men who have sex with men (NIH, 2017b).

CHAPTER 2

REVIEW OF THE LITERATURE

This chapter begins with a review of the historical context of HIV and AIDS in the United States, Latin America, and Mexico. Included in this historical overview, is a definition of HIV/AIDS and relevant biological processes to provide a foundation for the discussion of psychosocial, behavioral, and demographic factors linked to HIV/AIDS health outcomes and medication adherence. A theoretical framework was used to conceptualize these factors and provide empirical support for the current study. Additionally, the researcher discussed the importance of this study and how it is intended to support the need for integrative care in HIV/AIDS treatment.

Overview of HIV/AIDS: Epidemiology and Historical Context

Of all the global health crises that have occurred, few have had as devastating an impact in recent times as HIV/AIDS. Distinctively, it is also unequally distributed across the world's population (Lashley, 2000). Nearly four decades ago, the first indication of a bizarre immunodeficiency, uncommon opportunistic infections, and Kaposi's sarcoma were first noticed in young gay men in the United States (Lashley, 2000). These observations signaled the start of one of the most medically, emotionally, and politically alarming epidemics of the century. While this is the case, we have been able to learn and understand more about the human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS) in a shorter period than perhaps any disease in history. Much of what has been discovered has even been applied to research on other diseases such as cancer. During the beginning of this health crisis, emphasis was placed on identification of at-risk populations but has shifted in recent years

to focus on understanding behaviors which put individuals at risk of transmitting or contracting the virus. (Lashley, 2000).

The Human Immunodeficiency Virus (HIV) is a virus which is spread through bodily fluids and attacks the body's immune system by destroying CD4 cells, or T cells. This damage to the immune system decreases the body's ability to fight off infections and disease. If left untreated, HIV can continue to reduce the count of CD4 cells in the body making individuals who have been infected more susceptible to opportunistic infections or cancers (U.S. Department of Health & Human Services, 2016). HIV continues to be a major issue in global public health with an estimated 36.7 million people living with the virus (Joint United Nations Programme on HIV/AIDS [UNAIDS], 2014). While the majority of HIV cases have been diagnosed in sub-Saharan Africa, societies worldwide are affected by the virus.

AIDS is defined generally as a set of conditions that are indicative of severe immunosuppressive functioning related to an HIV infection. A decrease in CD4+ T lymphocytes below 500/mm^3 reflects this severe immunosuppression (Lashley, 2000). Two different types of human immunodeficiency virus (HIV), HIV-1 and HIV-2, affect humans. Substantial evidence exists supporting the hypothesis that HIV-1 in humans resulted from cross-species transmission of an agent in chimpanzees, and HIV-2 from cross-species transmission from sooty mangabeys (DeCock, 2008). Three groups of HIV-1 have been recognized: groups M, N, and O. The majority of the world's infections are with the HIV-1 group M viruses, of which some 10 different subtypes exist. In the United States and the Americas, Europe, and Australia, subtype B predominates. Subtype C has swiftly swept throughout much of India and Southern Africa. Generally, when people discuss HIV, it is implicit that they are speaking of HIV-1. Groups O and N viruses are effectively restricted to Central Africa (Worobey, 2008).

HIV-2 is less transmissible than HIV-1, conceivably due to the lower viral load associated with it throughout much of its natural history. HIV-2 is principally restricted to West Africa, but has been documented in individual cases across all continents. Countries with larger West African immigrant populations such as France, Portugal, and former Portuguese colonies have also had cases of HIV-2 (Worobey, 2008). Little evidence exists to suggest that transmissibility differs among the subtypes of HIV-1. However, the subtypes remain of interest to researchers due to the insight provided by their distribution which helps in the understanding of the spread of the HIV epidemic (Kull, 2010).

History of HIV/AIDS in the United States

Since the first documented AIDS-related deaths in 1981, HIV has grown into a pandemic which has deeply affected individuals, relationships, communities, politics, and the globe. In addition to being a serious disease, HIV generates problems in social, economic, and political domains which underscore inequalities on a global scale. Additionally, HIV/AIDS has brought attention to homophobia, poverty, racism, the oppression of women, and health care disparities (Kamya, 2010; Kull, 2010).

In 1981, the Centers for Disease Control and Prevention (CDC) began investigations of an emerging health crisis which seemed to be affecting men who identified as gay. In the next year, the CDC had documented cases among heterosexuals, intravenous drug users, babies, Haitians, and individuals with hemophilia (Centers for Disease Control and Prevention [CDC], 1981a; CDC, 1981b). While the illness was named acquired immune deficiency syndrome and challenged the label of "gay cancer", without a clear understanding of what caused the disease, many continued to view AIDS as the consequence of the immoral behavior (Harris et al., 1983; Kull, 2010; Levine, Nardi, & Gagnon, 1997). Gay communities in urban centers responded by

organizing political and community advocacy groups to uncover inherent disparities in the health care system of the United States. Fear later became widespread as public figures became affected and entered the spotlight. In the 1990s, while HIV/AIDS infections and deaths peaked, the Clinton administration made noteworthy advances in HIV/AIDS funding and developed the Office of AIDS Research which was intended to oversee the allocation of research funds (Kull, 2010).

Current State of HIV/AIDS in the United States

At the end of 2014, it was estimated that 1.1 million people ages 13 and older were living with HIV (CDC, 2015). This includes an estimated 166,000 individuals whose infections had not yet been diagnosed. The estimated number of new infections at this time was 37,600. Estimated annual HIV infections in the United States declined by 18% from 2008 to 2014 (CDC, 2015). In 2015, the number of new HIV diagnoses in the United States was 39,513. The majority, 31,991, of these diagnoses were of adult and adolescent males. The most affected racial group with 17,670 of the new diagnoses of infection in 2015 was African American (CDC, 2015). New diagnoses of Latinos comprised 9,290 while new diagnoses of Whites comprised 10,509. To this day, the leading cause of transmission remains male-to-male sexual contact comprising 26,375 of the new diagnoses in 2015. At the end of 2014, there were 955,081 people living with diagnosed HIV infections in the United States (CDC, 2015).

History of HIV/AIDS in Latin America

HIV emerged in Latin America during an era when anti-Americanism sentiments were rampant due to President Ronald Reagan's policies in Central America during the 1980s (Smallman, 2007). Subsequently, AIDS transformed into a compelling symbol of the menacing threat of American culture. HIV became symbolic of the perceived social collapse, degenerate

morality, and urban decay of American society. Media coverage in Latin America, influenced by this perspective, focused on reassuring the public by spreading the message that HIV/AIDS would not affect Latin America the way it had in the United States (Smallman, 2007). Hysteria ensued in Latin America once the first cases of HIV were confirmed across the region in the early 1980s. Even though the disease was initially isolated from the general population, impacting men living in the cities, the number of AIDS cases increased exponentially across Latin America with a rapid increase in the number of women diagnosed (Smallman, 2007).

Current State of HIV/AIDS in Latin America

In Latin America, where HIV prevalence is relatively lower, the epidemic continues to be stable with a large amount of cases being reported in countries with greater populations. In 2013, approximately 1.6 million people were living with HIV in Latin America with around 94,000 new diagnoses and 47,000 deaths directly attributed to HIV/AIDS and its affects (UNAIDS, 2014). Populations most affected are men who have sex with men, transgender women, sex workers, and people who inject drugs. While there has been an increase in awareness of the importance for increased education, testing, and funding for programs, it is estimated that 50% of people who are HIV+ do not know their status. This is a serious issue since lack of awareness of one's status can lead to late diagnosis when CD4 counts are already under 200 cells/mm^3 indicating a stage 3 infection, or AIDS. Fortunately, antiretroviral treatment (ART) is highly accessible across Latin American nations with nearly 75% of individuals in need of the treatment receiving it (UNAIDS, 2014; Avila-Rios et al., 2011). Programs in Latin America which have aimed to increase knowledge and change attitudes and behaviors associated with HIV risk have been shown to reduce discrimination and stigma which have historically been barriers to

treatment across the region. According to these statistics from UNAIDS (2014), three quarters of people living with HIV in this region are in Brazil, Colombia, Venezuela, and Mexico.

History of HIV/AIDS in Mexico

Early cases of AIDS were concentrated among middle- to upper-class gay men in the urban centers when the illness first appeared in Mexico in 1983. The risk posed by HIV was initially ignored as it was in the United States since the gay community was the primary victim (Frasca, 2005; Smallman, 2007). The threat of the illness was largely downplayed due to its absence among the general population. In the general population, worry did not exist that HIV/AIDS could be transmitted through unprotected heterosexual sex. However, terror spread with the possibility of catching the disease through casual contact with homosexuals. These sentiments led to increasing discrimination against homosexuals across the nation with violent messages appearing in public urging for the killing of homosexuals. In 1986, CONASIDA, a national AIDS council, was created which was followed by the establishment of a national surveillance system for HIV/AIDS to monitor the transmission of the illness after it had begun to appear in other populations (Stover & Bravo, 1991; Castro & Leyva, 2002). In 1987 and 1988 the government launched a significant education endeavor which aimed its efforts at providing condoms to the public. In the 1990s, the government also took steps to provide antiretroviral drugs to the general population. While at first only covered by social security and other state health plans, in 2003, President Vicente Fox vowed to make these medications available to all Mexicans who were HIV-positive (Carrillo, 2002; d'Adesky, 2004).

Current State of HIV/AIDS in Mexico

In Mexico, HIV/AIDS remains an urgent health matter which requires the interdisciplinary collaboration from a vast array of organizations and other divisions of the

public sector to effectively respond to its challenges. According to the Secretary of Health and the National Center for Prevention and Control of HIV and AIDS in Mexico, the HIV epidemic in Mexico is concentrated as it has not been established in the general population (Centro Nacional para la Prevencion y el Control del VIH y el sida [CENSIDA], 2015).. Currently, the prevalence in the general population is estimated to be .23% (UNAIDS, 2014). The epidemic remains specific to populations such as men who have sex with men (MSM, 17.3%), male sex workers (MSW, 24.1%), transgender women (TS, 15.5%), and people who inject drugs (IDU, 2.5%) (Centro Nacional para la Prevencion y el Control del VIH y el sida [CENSIDA], 2015). It is estimated that the prevalence of HIV infection in individuals between 15 and 49 years old is 0.2% - 0.3% and that there are up to 270,000 people with the virus living in Mexico. During the period 2010-2013, new cases of HIV and AIDS have increased, which seems to be a result of an increase in screening efforts rather than an increase in the spread of the virus. While HIV/AIDS has been reported in all states of Mexico, the majority of cases are concentrated in the Federal District and the State of Mexico. As in the United States, women have become the group with the highest prevalence increase over the past two decades and are more vulnerable to infection due to systemic problems regarding access to education, employment, and health services (CENSIDA, 2015).

In Mexico City, the first cases of HIV/AIDS in Mexico were identified in Mexico City in 1983. By 2012, around 40,000 people were living with HIV in Mexico City. This number represents 17% of national cases, making Mexico City the region with the highest prevalence of HIV in the country (Clinica Especializada Condesa, 2013). In a specialized clinic in the heart of Mexico City, a monthly average of more than 1,500 people are received in the detection and counseling centers of the clinic. Of the nearly 20,000 people who had presented voluntarily to

the clinic for HIV screenings in 2013, approximately 14% were HIV positive. Since 2008, there

has been an increase of 569% in the detection services of the clinic (Clinica Condesa

Especializada, 2013). In 2013 alone, each HIV counselor at the clinic served over 3,000

individuals. Additionally, this clinic is the first and only clinic in Mexico which caters to the

healthcare needs of transgender-identified individuals and has offered free specialized care

services to over 725 transgender persons. Monthly, an estimated 18 transgender-identified

individuals arrive as new patients of which more than 30% are HIV-positive. In 2013, a total of

935 people were victims of sexual violence, a vast majority (93%) were women with a mean age

of 23 years (Clinica Condesa Especializada, 2013).

Links between HIV, Psychosocial Stressors, and Wellbeing

Psychiatric morbidity was detected early in the HIV epidemic. As such, HIV has long

been associated with psychological distress including anxiety, depression, and other general

negative mental health outcomes as it is a disease which significantly impacts all aspects of

wellbeing (Folkman, 1993; Stewart et al., 2012; Choi et al., 2016). A study conducted in the

United States in the 90s showed that 48% of adults receiving care for HIV showed signs of at

least one psychiatric disorder on screenings within the previous year (Bing et al., 2001). This

study included 2,864 who were administered a screening assessment for multiple psychiatric

disorders including major depression, dysthymia, generalized anxiety disorder, and panic

disorder. Researchers in the Netherlands studied the relationships between coping styles, goal

disturbances, and psychological distress in HIV-positive individuals. In a sample of 43

participants from ages 23-63 who were at different stages of disease progression, the researchers

found that disturbances of daily events, or goal disturbance, was directly related to higher levels

of psychological distress. It was suggested from this study that these daily disturbances could

result from HIV and associated symptoms as well as the medical regimen or associated side-effects (Van Der Veek, Kraaij, Kopeen, Garnefski, & Joekes, 2007). A more recent study conducted in 2013 used a community sample of 197 people living with HIV/AIDS to examine the impacts of societal stigma and internalized stigma on psychological wellbeing. Researchers concluded that stigma associated with HIV plays a central role in the development of depression and anxiety, especially in individuals who display pessimistic coping styles (Herek, Saha, & Burack, 2013). In 2014, a study conducted using a representative community sample in rural South Carolina assessed perceived stress, mood profile, and symptom-related distress to better understand the association between symptom distress and psychological factors among HIV-positive persons. Participants were 18 years of age or older and were not taking medications to treat depression or anxiety at the time of the study. The results showed that the strongest correlations were between fatigue and symptom frequency and fatigue and symptom distress (Jaggers, Dudgeon, Burgess, Phillips, Blair, & Hand, 2014). These findings are important in their contribution to the literature since previous research has shown that fatigue is one of the most common symptoms reported by persons living with HIV/AIDS. Several studies in the early 2000s support these findings identifying strong correlations between fatigue and multiple measures of psychological distress and psychological distress, decrease in routine activities, and physical functioning due to fatigue (Norval, 2004; Phillips et al., 2004; Henderson, Safa, Easterbrook, & Hotopf, 2005; Hand, Phillips, & Dudgeon, 2006). Additionally, psychological distress has been detected in higher levels in persons living with HIV who report experiencing fatigue (Breitbart, McDonald, Rosenfeld, Monkman, & Passik, 1998). These combined results show that there is a long-known history of the correlation between psychiatric distress and

HIV/AIDS diagnoses with strong support for the consequences of long-term distress leading to negative health behaviors and decreased quality of life.

Psychological stress, dejection, and distress are pervasive with chronic illness. Common sources of psychological distress in individuals with chronic illness are the ambiguity regarding one's future state of health, instability of symptoms or physical discomfort, and the impact on the individual's family and relationships (Holder-Perkins & Akman, 2006). Studies of individuals diagnosed with severe illness have labeled several key themes for preserving emotional stability including a search for meaning, attempts to gain control over illness, and attempts to enhance self-esteem (Holder-Perkins & Akman, 2006).

The immediate psychological impact following an HIV diagnosis is commonly one of acute distress manifested as depressed mood, anger, shock, anxiety, tension, perceived stress, and overwhelming intrusive thoughts. The prevalence of these symptoms has not yet been determined. While these symptoms are typically mild, they can be severe and even crippling to the degree that they may meet the criteria for a diagnosable psychiatric disorder (Holder-Perkins & Akman, 2006).

Depression and HIV

Depression constitutes the second most frequently observed illness worldwide. In the United States, depression is observed in about 6.7% of the population (National Institute of Mental Health, 2017). Among chronically ill persons in the United States, the rate of depression is higher at 9.5% with patients who suffer from HIV infection or AIDS experiencing a rate of depression which is significantly higher, ranging from 20-40% (U.S. Department of Veterans Affairs, 2018). Additionally, suicide ideation tends to be present among two thirds of patients who are depressed and the rate of suicide among depressed patients is 10-15% (Ruiz, 2006).

Several factors that put patients with HIV/AIDS at higher risk for depression are those with exposure to chronic stress, inadequate social support, and passive coping styles. Other factors which contribute to higher risk of developing depression are nondisclosure of HIV status, multiple losses, advanced illness, alcoholism, substance use, female gender, and personal or family history of suicide attempts, mood disorders, and anxiety disorders (Ruiz, 2006). The most common complications of chronic medical illness involve depressive symptoms. Studies have shown that depression has a damaging effect on patients' quality of life, adherence to treatment, and treatment outcomes (Treisman & Angelino, 2004). Despite compelling research, depressive conditions remain underrecognized, underdiagnosed, and undertreated in medical clinics, especially in treatment centers focused on HIV/AIDS. Depression should be a major concern for HIV/AIDS researchers and treatment providers as it can impact patient attitudes toward treatment. Individuals with depression often care less about their own safety, act impulsively, and have perpetual feelings of hopelessness (Treisman & Angelino, 2004).

Studies have shown an increased prevalence of HIV among individuals who have mental health problems and an elevated prevalence of depression and other mental health conditions across individuals who are HIV seropositive (Anderson & Weatherburn, 2004; Bing et al., 2001; WHO, 2008). Researchers exploring the association between disease progression and depression in both men and women found that individuals with HIV who exhibited depressive symptoms were nearly 2 times more at risk of mortality than individuals who did not (Ickovics et al., 2001; Mayne, Vittinghoff, Chesney, Barrett, & Coates, 1996). While an abundance of research has established the connection between physical illness and depression, it has been challenging to establish the causal pathway between the two. Depression can affect immune function; however, it may also be the outcome of disease progression or negative life events (Pence et al., 2006).

Adherence and HIV

Adherence to medication can be defined as the extent to which a person's behavior matches the health care regimen prescribed by a medical professional. Importantly, this treatment regimen should be agreed upon by the healthcare professional and the patient. Adherence involves taking medication correctly, at the right time, with the proper frequency, and at the accurate dosage (Brown & Bussell, 2011; Cramer et al., 2008). Medication adherence is vital for improving health outcomes with physicians emphasizing 80%-95% adherence for optimal trajectory of health outcomes (Osterberg & Blaschke, 2005). However, physicians researching and treating HIV patients suggest 95%-100% adherence to antiretroviral medication to impede the replication of HIV in the bloodstream, strengthen immune functioning, lower likelihood of transmission, and decrease the chances of developing drug resistance (National Institutes of Health, 2017; Smith, Rublein, Marcus, Brock, & Chesney, 2003). While many HIV regimens currently include a combination of medications to effectively treat individuals, two main types of antiretroviral medications used are protease inhibitors and non-nucleoside reverse transcriptase inhibitors. Research has shown that in samples of HIV-positive individuals adhering 90% of the time to each of these classes of drugs, 55% of patients taking protease inhibitors and less than 10% taking non-nucleoside reverse transcriptase inhibitors experienced virologic failure (Paterson et al., 2000; Viswanathan, et al., 2016). As the level of adherence decreases, the likelihood of virologic failure will increase. Virologic failure is defined as a level of greater than 400 copies/mL of HIV in the bloodstream than the last clinic visit. Virologic failure and drug resistance can develop when adherence is not at optimal levels, increasing the chances that an individual could develop and transmit new drug-resistant strains of the virus in which HIV medications may no longer be effective (National Institutes of Health, 2017b). Factors to

consider which may impact adherence in an individual are side effects, high cost of treatment, lack of access to treatment, poor communication between provider and patient, unstable living situation, alcohol or drug use, fear of disclosure, and illness or depression (National Institutes of Health, 2017b; Cutler & Everrett, 2010; Simpson, 2006). In research conducted examining correlations between race and medication adherence, researchers found that Hispanics and African Americans have lower medication adherence rates in comparison with Caucasians (Manias & Williams, 2010; Simpson, 2006).

Depression, Adherence, and HIV

Depression and psychological distress have been well-documented in research as contributing factors to negative health outcomes and poor adherence to medical treatments (DiMatteo et al., 2000; Manning & Wells, K. B., 1992). Grenard et al. (2011) conducted a meta-analysis of 31 studies including over 18,000 participants to explore the relationship between depression and medication adherence in the treatment of chronic illnesses in the United States. Depressed patients were found to be 1.76 times more likely to be nonadherent to treatment regimens than their non-depressed counterparts. In a review of the literature regarding Latino HIV-positive men who have sex with men (MSM), increased levels of depression were associated with increased frequency of high-risk sexual behaviors, implicating increased risk for transmission of HIV, especially if those individuals were nonadherent (Gonzales, Hendriksen, Collins, Durán, & Safren, 2009). In the United States, where Latinos are less likely to seek help and receive proper treatment for mental illness, including depression, the risk for nonadherence is increased (Gonzales, Hendriksen, Collins, Durán, & Safren, 2009). Numerous studies focusing on HIV-positive men and adherence behaviors have supported the relationship between depression and nonadherence to treatment underscoring the importance for effective and

informed clinical practice, preventive measures, and intervention (Blashill, Perry, & Safren, 2011; Gonzalez et al., 2004).

In Mexico, researchers have found depression to be prevalent among persons living with HIV at similar rates to studies conducted in the United States (Caballero-Suarez, Rodriguez-Estrada, Candela-Iglesias, and Reyes-Teran, 2017). In northern Mexico, a study was conducted with 64 participants where researchers examined the relationships between stress levels, depression, and adherence to medication regimen. The results of the study showed that high levels of stress and depression tend to occur simultaneously and contribute to poor adherence to medical treatment (Piña Lopez, Dávila Tapia, Sánchez-Sosa, Togawa, & Cázares Robles, 2008). This has strong implications for assessment, early intervention and treatment, and maintenance for HIV/AIDS patients as poor adherence to antiretroviral medication may result in proliferation of HIV in the body as well as drug resistance. Pérez-Salgado, Compean-Dardón, & Ortiz-Hernández (2016), obtained a sample of persons living with HIV from various clinics in Mexico to study the relationship between food insecurity and adherence to HIV medications. From the sample in Mexico City, it was noted that psychological distress best explained the relationship between food insecurity and medication adherence. While food insecurity is associated with poor mental health and poor adherence to treatment, it is also important to note that poor mental health status has generally been associated with nonadherence. That is to say, deficient psychological distress is another potential mechanism by which food insecurity would be associated with nonadherence to medication.

Models of Stress and Coping

Helpful to understanding the impact of HIV/AIDS on an individual are two models to conceptualize responses to stressors: the biopsychosocial/spiritual model and the Transactional

Model of Stress and Coping. The first acknowledges that all persons have many aspects of life which interact with each other while the second discusses stressors, reactions to stressors, and the consequences of these reactions.

Biopsychosocial Model

Historically, Western society has viewed biological, psychological, social, and spiritual domains of an individual separately and has viewed health care as medical care with an emphasis on biomedical responses. In this model, these domains (biomedical, psychological, social, and spiritual) are distinct in order to distinguish components relevant to assessment and intervention planning, however, it is important to emphasize that these components interplay and impact one another (Engel, 1980; Winiarski, 1997).

In the case of an individual who has been diagnosed with HIV, an individual is typically faced with a series of laboratory tests, appointments with medical providers, and prescriptions for medications. While important, the individual's psychological response, support system, and spiritual reaction also require attention. Medical assessment, intervention, and treatment practices of HIV are the norm in many clinics and agencies in developed nations, while adequate attention to psychological, social, and spiritual issues often neglected. For psychological functioning, it is important to note the client's pre-HIV psychological status and how it has changed due to the diagnosis of HIV. Individual emotional response, acute psychological symptoms, history of mental illness or substance use, and sexual functioning should also be key components of a psychological assessment. Regarding social issues, a client's cultural background should be better understood to provide context for the individual experience of diagnosis, living with HIV, and one's psychosocial reaction to living with HIV. Socioeconomic status may also provide relevant information as to an individual's vulnerability to isms such as

racism, classism, heterosexism, and sexism. Other social factors to consider are education level, with whom with client lives, family response to diagnosis if HIV status was disclosed, family structure, and relationship status (Straub, 2011).

The Transactional Model of Stress and Coping

The Transactional Model of Stress and Coping developed by Lazarus and Folkman (1984) provides a framework through which this proposed study can be viewed. The model, as shown in Figure 1 below (Ross & Altmaier, 1994) provides a foundation for conceptualizing stressors and how the reactions to stressors impact the trajectory and outcomes of chronic illness as it examines stress and the interaction between people and their environment. These transactions, as they are called, between the person and environment, depend on the impact of the stressor and are mediated by the individual's appraisal of the stressor. This is what is termed as primary appraisal or a person's perception of the event.

Additionally, the model takes into consideration the available societal resources. This secondary appraisal is a judgment of one's own internal resources or coping strategies as well as external resources and options. Stress, then, is defined as these aforementioned transactions which are perceived to exceed the internal and external resources of an individual thereby causing immense strain on one's wellbeing (Lazarus & Folkman, 1984). Together, this set of appraisals assists an individual in understanding what course of action, if any, can be taken to address a stressful situation. These efforts to cope with the stress lead to outcomes of the coping process which have an impact on health behaviors, wellbeing, and overall functioning (Cohen, 1984). In addition to describing cognitive appraisal, Lazarus (1999) discusses the significance of emotions and impacts on the coping process.

According to Lazarus (1999), these two forms of appraisal function interdependently although he describes them as two separate and equally important mechanisms. Primary appraisal relates to "values, goal commitments, beliefs about self and world, and situational intentions" (p. 73). In this mode of appraisal, goal commitments are seen as having the greatest influence since it relates to the way an individual will work toward a goal. If an individual is without goal commitment, stress and associated emotions will not occur since there is a lack of investment in one's wellbeing directly related to a specific transaction. When goal commitments do exist, the person places more value in a transactional situation which leads to a disturbance in the usual daily occurrences due to a sense of potential harm (damage already occurred) or threat (possibility of damage occurring in the future).

Secondary appraisal largely involves a cognitive process whereby the individual evaluates a course of action about a transaction, or stressful person-environment interaction. This evaluation occurs simultaneously when a person perceives harm or threat through primary appraisal. While this secondary appraisal is not in actuality a form of coping it does have implications for the effectiveness of one's ability to cope with the given situation. The model postulates that the more confidence one has about one's ability to address obstacles and adversities, the more likely the individual will experience challenge rather than threat. It is obvious that situational perceptions and resources differ significantly among people, so the experiences of a specific transaction largely depend on the individual and context (Lazarus, 1999).

Concerning emotional appraisal, the structure that applies to cognitive appraisal also applies. The three components of primary appraisal of emotion consist of goal relevance, goal congruence, and type of ego involvement. Emotions are then seen to be the product of the goal or

lack of goal, whether the conditions of a transaction are favorable to the individual or not, and the self-esteem, morals, and ideals of a person. Secondary appraisal of emotion consists of coping potential and future expectations of a transaction (Lazarus, 1999).

Application of Stress and Coping Models

More recently, literature has begun to apply the framework of stress and coping models to HIV research and has shifted focus to the role of stress and coping in both the physical and mental health of HIV+ patients. One research investigation which analyzed the appraisal of meaning attributed to an HIV diagnosis indicated that a positive personal meaning contributed to adaptation to illness. This finding highlights the importance of consideration of psychological wellbeing in the impact of HIV on the individual and supports that further research is needed in this area to encourage the development of clinical mental health interventions aimed at reducing negative effects of HIV-related stress (Farber, Lamis, Shahane, & Campos, 2014). In a study conducted by Varni, Miller, McCuin, & Solomon (2012) it was found that individuals who reported higher perceptions of stigma associated with their positive HIV diagnosis were more likely to experience depression and anxiety as well as show evidence of avoidance and disengagement styles of coping. In addition to these findings, this study also found that individuals who perceived stigma also reported lower self-esteem. As the Transactional Model of Stress and Coping suggests, it is imperative to consider both internal and external resources that an individual perceives as available for coping. A study conducted by Chaudoir et al., (2012), for example, found a relationship between spirituality and mental health of HIV+ patients in which a strong sense of spirituality mediated the effect of stigma on distressing mental health symptoms.

While the links between stress and immune system functioning is complex, it is undeniable that stress and other psychosocial factors impact immune function, including CD4

levels in the blood. Even though the impact of stress is dependent upon the extent and force of the stressor, the influence of chronic stress is long-term and enduring (Aldwin, 2007). In research that studied the effects of stress on exposure to a virus, participants who reported chronic interpersonal stress were more likely to develop clinical symptoms of the virus (Cohen, Tyrrell, & Smith, 1991). Additional research on the healing of wounds has shown that participants who experience greater levels of stress take longer to heal, likely due to lower levels of proteins (cytokines) in the immune system caused by the stress which help to regulate inflammation and healing (Kiecolt-Glaser, Page, Marucha, MacCallum, & Glaser, 1998). Furthermore, in addition to mental health issues, immense stress experienced by an individual has been associated with poor ART adherence which can lead to decreases in the CD4 count allowing for the proliferation of HIV and even to drug resistance (Brinkley-Rubinstein, Chadwick, & Graci, 2013). Drug resistance is of a major concern in Mexico, specifically, which has been a country of focus since there has been an increase in patients displaying resistance to ART over the past few years (Avila-Rios et al., 2011). The findings reported in the current literature on mental health and HIV support the need for further research on the impact of social factors and mental health support on the physical and mental health of HIV positive individuals. While there are many factors influencing the lives of those affected by HIV, it is essential to gain a better understanding of the array of stressors impacting this population to help professionals, and healthcare and government organizations engage in the development of better education, programs, and clinical interventions.

Social Support and Disclosure of HIV-positive Status

Social support has long been explored as a key component in health outcomes for individuals with chronic illness. For individuals with HIV/AIDS, disclosure of one's status is a

unique process complexly connected to social support and influenced by factors such as race, society, perception of stigma, family, children, sex partners, and mental health (Rotzinger et al., 2016). Chaudoir, Fisher, & Simoni (2011) reviewed literature on disclosure and its relationship to social support, collaborating to establish a model which addresses the gaps in research on this topic. Their Disclosure Processes Model aims to provide a framework to conceptualize the process of disclosure for people living with HIV/AIDS. These researchers emphasize that previously developed models have focused on the identification of factors leading to disclosure such as disease progression, perceived consequences, and levels of relationship intimacy (Bairan et al., 2007; Serovich, 2001; Serovich, Lim, & Mason, 2008) rather than the outcomes of disclosure. The creators of the newer processes model argue that disclosure has implications for both individual health and public health by having positive influences on overall health and health behaviors. For example, individuals living with HIV/AIDS might attain greater social support after disclosure encouraging openness about status and a change in behaviors and perceptions impacting one's health (Kalichman, DiMarco, Austin, Luke, & Difonzo, 2003). Individuals may disclose their HIV-positive status to strengthen their relationships and to gain social support from others, however, individuals may also avoid disclosure of their positive status due to fear conflict and social rejection (Chaudoir, Fisher, & Simoni, 2011). Disclosure has the potential to impact health outcomes as it can result in more social support, the mitigation of negative psychological effects of suppression, and overall improved psychological wellbeing (Strachan, Bennett, Russo, & Roy-Byrne, 2007). In a study conducted by Hays, McKusick, Pollack, & Hilliard (1993), researchers found that HIV-positive MSM who disclosed their status to their supports reported lower depression at a one-year follow-up. Strachan et al., (2007) conducted a longitudinal study in which they found increased improved immune functioning

predicted by disclosure of HIV status among a group of HIV-positive men and women in the United States. This research was supported by previous research conducted by Sherman, Bonanno, Wiener, & Battles (2000) which found increases in immune functioning among children who disclosed their HIV status to at least one friend after a one-year follow-up in comparison to children who had not disclosed their HIV-positive status. However, research regarding disclosure and social support have been contradictory and inconsistent, especially in regards to adherence to antiretroviral medications for HIV. According to the Disclosure Processes Model, adherence to HIV medications can be facilitated by disclosure in that disclosure provides access to social support and allows for individuals to take their medication publicly, or at the very least in front of their supports to whom they have disclosed. Other research has shown the opposite, specifically that disclosure has no association with adherence or may actually lead to nonadherence. People living with HIV/AIDS often experience stigma surrounding their diagnosis which may lead to psychological distress and chronic anxiety, ultimately hindering adherence to antiretroviral medications (Guimarães et al., 2008; Sherr et al., 2008). Waddell & Messeri (2006) found that while social support may in fact predict medication adherence, social support only seems to matter when individuals have disclosed. Researchers have had difficulty establishing the connections between social support, disclosure, and medication adherence due to these inconsistencies but also due to the complex relationships existing between these mechanisms and the probability that these relationships are mediated by other psychological factors (Huynh, Kinsler, Cunningham, & Sayles, 2013; Waddell & Messeri, 2006).

In a cross-sectional study conducted in Mexico, 172 participants living with HIV/AIDS were involved in a study examining antiretroviral adherence behaviors and the relationship to

psychological and social variables (Ybarra Sagarduy, Piña Lopez, González Ramírez, & Fierros Dávila, 2017). Among these 172 participants, 141 were 100% adherent to their treatment regimens. The researchers used several measures including the Psychological Variables and Adherence Behaviors Questionnaire (VPAD-24), the Stress-Related Situations Scale (SVE-12), the Zung Depression Scale, and the Duke-UNC Functional Social Support Questionnaire, three of which were adapted and validated in Mexico. Using structural equation modeling, the researchers found a relationship between personality and medication adherence behaviors. However, despite low levels of depression and high levels of perceived social support reported among participants, no significance was determined in any of the structural models in this study (Ybarra Sagarduy, Piña Lopez, González Ramírez, & Fierros Dávila, 2017). The positive behaviors associated with personality, however, were found to have a direct, significant effect on immune functioning and viral load.

Interpersonal Violence

Interpersonal violence is a broad term which includes child abuse, intimate partner violence, hate crimes, and sexual assault and rape by a partner or non-partner. Interpersonal violence has strong implications for health outcomes and health-related behaviors (Blashill et al., 2011). Interpersonal violence has been associated with increased mental health issues including PTSD and depression, chronic pain, and increased utilization of healthcare resources. Several studies have been conducted to explore the links between medication adherence in exposure to interpersonal violence. In a study conducted by Ramachandran, Yonas, Silvestre, and Burke (2010), 73% of individuals in a sample of 56 diagnosed with HIV infection reported a history of interpersonal violence, specifically intimate partner violence. Researchers found higher levels of medication nonadherence among the 73% with exposure to violence during their lifetime. In

another study conducted in 2010, researchers investigated the impact of intimate partner violence on adherence to antiretroviral medication. Researchers obtained a sample of 190 participants who were prescribed a medication regimen for HIV (Lopez, Jones, Villar-Loubet, Arheart, & Weiss, 2010). It was found that a history of experiencing intimate partner violence was a significant predictor of medication nonadherence for women but not men. Researchers found a significant relationship, however, between negative coping strategies and poor adherence behaviors among men. In a study where researchers tested a path model for nonadherence, researchers found that interpersonal violence was correlated with poor medication adherence in addition to poor quality of life and increased viral load among a sample of 178 HIV-positive men (Pantalone, Hessler, & Simoni, 2010). Other recent research which has focused on the occurrence of intimate partner violence experienced by women has suggested that intimate partner violence and interpersonal violence may lead to higher viral load and increased risky-behavior, including medication nonadherence (Rose, House, Stepleman, 2010; Trimble, Nava, & McFarlane, 2013). Important to note is that viral load could be an indicator of nonadherence to medication or even virologic failure.

In a study conducted in Southern California, data was collected from 914 Latina participants relating to history of abuse (Newcomb, Locke, & Goodyear, 2003). Researchers explored variables such as family abuse, sexual abuse, and family neglect and their relationship with outcomes such as HIV-attitudes and HIV-related behaviors. Using structural equation modeling, the researchers concluded that childhood experiences of abuse do play a role in predicting HIV-related risk among other negative effects such as psychosocial functioning. A large study based on the Behavioral Risk Surveillance System Survey (Kessler et al., 2010) involved assessing for experiences of sexual, psychological, and physical abuse in 48,526 adults

from five U.S. states (Campbell, Walker, Leonard, & Egede, 2016). Multiple logistic regression models were used to find relationships between experiences of abuse during childhood and health outcomes. Researchers found that sexual abuse and verbal abuse predicted risky HIV behavior and depression. This information is important and relevant especially since childhood abuse and violence are especially prevalent among ethnic minorities, including Latino/as. In studies conducted among Latino MSM, it has been found consistently that rates of childhood abuse seem to be higher when compared to non-Latino MSM (Balsam, Lehavot, Beadnell, & Circo, 2010; Feldman & Meyer, 2007).

Impulsivity

Psychiatric disorders and symptoms are more prevalent in people living with HIV/AIDS and individuals with a diagnosable psychiatric disorder are more likely to be nonadherent to their medication regimen (Bing et al., 2001; Gonzalez, Batchelder, Psaros, & Safren, 2011), Additionally, impulsivity and depression have been reported in association with poor adherence to medication among HIV-positive individuals. In a study conducted with 103 participants, 56% of whom were diagnosed with mood disorders, researchers found that the participants who scored high on measures assessing sensation-seeking behaviors and impulsivity were less likely to adhere to their medication (Liraud & Verdoux, 2001). This effect was found after controlling for history of substance abuse. In a study conducted in Mexico City among HIV-positive patients, levels of impulsivity and depression were measured among 1,350 patients, 89% male, using the State Impulsivity Scale (Iribarren et al., 2011) and the BDI (Beck, Steer, & Brown, 1996). Levels of impulsivity were highest among patients who were depressed, suggesting greater risk for poor adherence and risky sexual behaviors among depressed patients (Vega-Ramirez, et al., 2015).

The Role of Cultural Competence in HIV/AIDS Treatment

Culture is a vital element in the helping process since it is rooted in how circumstances are defined and exhibited. Culture influences how a person seeks help, how services are provided, and the treatment options (Pinderhughes, 1989). Cultural competence is the foundation of effective and ethical practice in healthcare and encompasses a set of behaviors, skills, knowledge, attitudes, and policies which together enable the system to function effectually in cross-cultural scenarios (Pardasani, Moreno, & Forge, 2010). Cultural competence in the context of HIV work is a process of continuous learning and development demanding the unpretentiousness to accept that it will be unfeasible to comprehend all aspects of the cultures with which one will have contact. However, as practitioners continue to serve others of diverse backgrounds with an openness to learning, practitioners invite understanding and appreciation for cultures different than their own and are better able to have empathy for different worldviews. Additionally, practitioners will be more apt to modify and adjust interventions for culturally diverse individuals (Cross, Bazron, Dennis, & Isaacs, 1989).

Researchers have identified critical skills and have advocated for the necessity of culturally relevant treatment models, prevention strategies, and harm reduction models in their conceptualization of cultural competence. For example, an explanatory system was developed to understand the importance of a person's worldview and assessment tools were developed to assist in the evaluation of cultural competence levels among practitioners within the HIV service field (Meleis, 1999; Vinh-Thomas, Bunch, & Card 2003). In the aforementioned assessment, personal biases and values, understanding of the population's worldviews, respect for diversity, nonjudgmental and affirming attitudes, community involvement, and cross-cultural relationship skills were evaluated. It is imperative that HIV health care providers avoid stereotyping members

of any cultural or ethnic group and that they understand individual life perspectives (Taylor-Brown, Garcia, & Kingson, 2001). Additionally, advocating for safe, integrated, and supportive communities where human rights are protected are promoted should also be stressed (Rowe, 2007).

Pardasani, Moreno, and Forge (2010) developed a conceptual model for cultural competence in HIV work which includes several interlocking systems and factors for consideration within each of the four domains: Individual, Family, Organization, and Society and Community. Within each of these domains, they stress the importance of values, beliefs, norms, religion, socioeconomic status, and language as common threads which have an impact on each of the four interlocking systems. The researchers additionally highlight the consideration of the impact of stigma, support, and organization and public policy as influential factors in an individual's experience of HIV/AIDS.

Cultural Considerations in Mexican Population: Variables Influencing Mental Health

In Mexico, national prevalence of depression was 3.3% in 2017, affecting more women than men ("La depresion afecta al 3.3%", 2017). Regarding mental health and HIV/AIDS work with Latinx-identified communities in the United States and with individuals in Mexico, certain factors must be kept in consideration. Gender inequality in heterosexual relationships, traditional patriarchal hierarchies, religion, idiosyncrasies of language, and sexual norms on high-risk sexual behaviors are all factors that must be highlighted in work with this population (CDC, 2017; Galanti, 2003; McQuiston & Flaskerud, 2003; VanOss-Marin, 2003). For example, in Latin American cultures, the cultural beliefs of machismo and mariansimo have the capacity to negatively impact both heterosexual and homosexual relationships (Moreno, 2007). The following sections present culture-specific factors which may be associated with increased

psychiatric morbidity, psychological distress, and specifically, depression in persons living with HIV/AIDS in Mexico.

Family-related issues and social stigma. A diagnosis of HIV can immensely impact one's social and family life. Fear of disclosing one's status is common and often results from perceived social stigma. Perceived social stigma due to HIV diagnosis has been associated with increased chronic stress from social isolation and a decreased quality of life (Block, 2009; Foster & Gaskins, 2009). A strongly held value in Mexico, *familiarismo,* conveys a sense of loyalty to the family. While family is certainly a source of great support, it can also be a source of significant challenges when considering issues relating to HIV, sexual orientation, and substance use. Individuals who fear disclosing their seropositive status to family members may isolate from their support system in turn increasing levels of psychological distress. For individuals who experience challenges with their family unit, it will be important for clinicians to understand the impact on the individual as well as to help them find alternate sources of support (Lescano, Brown, Raffaelli, & Lima, 2009). Presence of social supports and sense of belonging have been linked to better psychological adjustment and reduced stress in individuals with HIV. Conversely, social isolation subsequent to negative HIV/AIDS-related stigma is an adverse outcome of HIV often experienced by those diagnosed. Living alone or with someone other than a partner has been associated with the presence of a current psychiatric disorder among people receiving treatment for HIV/AIDS (Wolitski, Pals, Kidder, Courtenay-Quirk, & Holtgrave, 2009).

Two contributing factors to increasing the risk in promoting transmission of HIV infection in Latin American communities are *machismo* and *marianismo*. Pressures to fit into heteronormative stereotypes and roles may present a barrier to a Latino man acknowledging and

accepting high-risk behaviors such as having sex with other men. The desire to conceal these behaviors may influence the desire to portray oneself as heterosexual thereby providing inaccurate portrayals of one's sexual behavior. This causes an additional barrier as it further complicates access to education, prevention, and treatment efforts. (Centers for Disease Control, 2017).

While *machismo* may not be the norm in each household, it is certainly present at community and societal levels. In households where values and practices are influenced by *machismo*, women may feel powerless and unable to assert themselves even in situations as negotiating safe-sex. Condom use may be unacceptable as it may be contrary to religious beliefs or may imply a lack of trust. These situations can be potentially dangerous as they may lead to violence (Fernandez, Ruiz, & Bing, 1998). In this same vein, *marianismo* conveys the idea that women should be submissive to their male partners, as such, many traditional households are centered around the husband (Peragallo, 1996).

Gender and sexual orientation. Gender and sexual orientation play important roles in examining mental health in HIV-positive individuals. Gay men, for example, while more likely to contract HIV are already more likely to be depressed. In a study conducted in Mexico City by Caballero-Suarez, Rodriguez-Estrada, Candela-Iglesias, and Reyes-Teran (2017), data was collected from a cross-sectional survey conducted between 2012-2013 at a specialized clinic in Mexico City which focused on condom use and serostatus disclosure. Sociodemographic information, time since HIV diagnosis, CD4 counts, and viral load of the previous six months were acquired. Additionally, a version of the Beck Depression Inventory and Beck Anxiety Inventory, both adapted to the Mexican population and to Mexican persons living with HIV, were administered. In this sample of 291 persons, 13% identified as women, all heterosexual. Of

the men in the study, 22% identified as heterosexual. There were no significant differences between men and women in terms of viral load, CD4 counts or time since diagnosis; however, more women than men self-reported current psychiatric treatment. The researchers found that women who have HIV have higher rates of depression and anxiety than do men with HIV. Moreover, it was found that women with HIV generally have a lower quality of life than men who are living with HIV. Research has also shown that a diagnosis of major depression was four times greater in women who were diagnosed with HIV than women who were not. Suicidal ideation and attempts of suicide are also recorded to be greater among HIV-positive women than HIV-positive men.

While Mexico City and other urban centers of Mexico tend to be more tolerant of homosexuality and the LGBT community, overall, homosexuality is rejected. This is tied into other factors such as *machismo* and religion. This dynamic creates a complex interaction of factors which can contribute to increased depression in individuals diagnosed with HIV.

Religion. In Mexico, religion is a core element of life. It is a country rooted in fundamental teachings of Catholicism, a major presence for the past five centuries. The transmission of HIV often occurs within the context of behaviors frowned upon by Catholic teachings. In a society where religion influences not only outlook on life but also labeling of behaviors, many individuals faced with the tribulations of an HIV infection or circumstances can feel ostracized by faith groups, family members, or society (Instone & Mueller, 2011).

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Importance of Current Study

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Medication adherence is vital for HIV/AIDS patients. However, research has shown that adherence continues to be an issue among individuals living with various chronic illnesses. In the United States, it is estimated that more than 25% of patients with chronic conditions are

nonadherent to their prescribed medication regimens with an annual cost of nonadherence

estimated to be near $290 billion US dollars (Taitel, Jiang, Ewing, & Duncan, 2012). While HIV

medication has improved and become more accessible in many parts of the world, rigorous

adherence to the medication remains an essential part of treatment for improved health outcomes,

and avoidance of virologic failure and drug resistance. Psychological and social factors have

been well-documented in research as contributing factors to negative health outcomes and poor

adherence to HIV medication in the United States and Mexico. According to the U.S.

Department of Health and Human Services (2016), several factors contributing to nonadherence

are side effects of medication, busy schedule and travel, unstable living conditions, illness or

depression, substance use, fear of disclosing HIV status, or lack of health insurance or finances

to cover the cost of medication. This knowledge supports the need for early intervention

strategies and early screening for risk factors which could contribute to medication

nonadherence. Due to the variability found in the literature regarding adherence, there are

existing implications for repeated studies and testing within new groups of individuals across

cultures and the need for integrative care and collaboration among medical professionals and

mental health professionals. By streamlining care to include better communication and

collaboration among mental health professionals and physicians, there is greater potential for

improved patient outcomes, holistic care, and improved intervention strategies (Winfield,

Sparkman-Key, & Vajda, 2017). A retrospective cohort study conducted in the Midwest of the

United States, evaluated a program which was designed to improve adherence to medication

among new patients receiving statin therapy. The program involved face-to-face counseling

sessions with pharmacists who utilized motivational interviewing techniques to assist patients

with their medication adherence. Adherence was measured using a medication possession ratio

and was based on the benchmark of 80% adherence which is commonly used in medication

adherence research. Researchers found that patients who participated in the counseling program

exhibited greater adherence to their medication regimen than patients who were part of the

comparison group and received usual care. This study not only highlighted the effectiveness of

brief counseling interventions to improve medication adherence but showed the potential for the

involvement of counseling professionals who could participate in the training and coaching of

medical staff in motivational interviewing, empathic responding, and screening for various

psychological risk factors for medication nonadherence.

CHAPTER 3

METHODOLOGY

This chapter describes the methodological design of the study on HIV, medication adherence, mental health, and psychosocial factors. First, this section explains the purpose of the study and research questions which guide the study. Next, the quantitative research design of the study and sequential logistic regression model are discussed. Detailed information regarding participants, data collection, and relevant instrumentation are provided. Finally, information regarding validity of the methodological design is explained.

Purpose and Research Questions

The purpose of this study was to examine the relationships among psychosocial factors, immune functioning, and medication adherence in HIV-positive individuals. The researcher intended to investigate these relationships to contribute to improved interventions in integrative care settings. Based on prior literature the following research questions guided this study:

1. What is the relationship between CD4 counts and violence, disclosure, and social support in HIV-positive individuals?

    a. H_1: Exposure to violence will have a negative relationship with CD4 counts.

    b. H_2: Social support will have a positive relationship with CD4 counts.

    c. H_3: Individuals who received an accepting response from family members will have significantly elevated CD4 counts in comparison to those who did not disclose their status, or received a rejecting or indifferent response.

2. To what extent do disclosure, social support, impulsivity, and exposure to violence predict medication adherence in HIV-positive individuals after controlling for depression and major stressors experienced within the past year?

a. H$_4$: Rejection and indifference from family members, impulsivity, exposure to violence, and decreased social support will increase the probability of nonadherence to medication.

Research Design

The dissertation utilized a nonexperimental, cross-sectional research design. This data is cross-sectional since the data was recorded from a specific group at a single point in time (Thompson & Panacek, 2007). Cross-sectional research provides a naturalistic view of the investigated phenomena due to lack of researcher influence which often exists in experimental research in which variables are intentionally manipulated (Field, 2017). The majority of the data in this study was self-report collected via intake questionnaire and a battery of self-report assessments. Clinical mental health and medical professionals provided additional information on the intake forms in regard to mental health diagnoses, mental health issues identified as barriers to treatment, and CD4 counts and viral load as determined by laboratory blood tests.

This study investigated psychosocial phenomena that were measurable and objective, therefore supporting the use of quantitative linear methods to test the research questions (Bernard, 2013). Previous research on HIV-positive individuals focusing on adherence have used a variety of research designs and analyses to study factors influencing medication adherence and nonadherence among people living with HIV/AIDS. Studies reported in the literature utilized bivariate and multivariate logistic regression models, however, lacked sequential analyses to control for the influence of pre-existing psychological variables (e.g. Chandwani et al., 2012; Rotzinger et al., 2016; Weaver, Pane, Wandra, & Windiyaningsih, & Samaan, 2014). Most recently, in a study conducted in a northern state of Mexico, researchers used structural equation modeling to examine psychological influences on antiretroviral medication adherence in a

population of Mexican people living with HIV/AIDS. This study included variables such as

decision-making, tolerance of ambiguity, tolerance of frustration, motivates to behave,

depression, and social support (Sagarduy et al, 2017). In this model, social support and

depression were found to be nonsignificant in relationship with medication adherence, unlike

other analyses mentioned in the literature where depression and social support were found to be

significant (Grenard et al., 2011; Gonzalez et al., 2009). In the field of HIV/AIDS research,

contradictory literature is the norm, requiring specific models to be tested within new

populations in differing geographic regions, cultures, and ethnic groups. The current data set had

never been analyzed and contributes to the body of literature on people living with HIV/AIDS.

To better understand the relevance of psychosocial factors in the role of medication adherence in

the population of HIV-positive individuals in Mexico City, a regression analysis was most

helpful since regression analyses assist in studying the relationships between several predictor

variables and an explicit outcome (Heppner, Wampold, & Kivlighan, 2008). For this study, a

sequential logistic regression analysis was utilized in which the researcher specified the order of

entry of the predictor variables based on a theoretical rationale (Petrocelli, 2003; Tabachnick &

Fidell, 2014). Since contradictory findings present themselves in the literature, a sequential

logistic regression controlled for pre-existing psychosocial variables (e.g. depression and major

stressors experienced within the past year) based on the theoretical framework presented in

Chapter Two to provide knowledge of the extent to which disclosure, exposure to violence,

social support, and impulsivity impact medication adherence in this population. The researcher

entered the pre-existing psychosocial variables first to control for the effects of these variables to

understand the effects of disclosure, social support, impulsivity and violence beyond that

accounted for by depression and other major stressors. This allowed the researcher to perform a

more rigorous analysis of the relationship between the variables of interest and medication adherence.

Included in the model for the current study were 6 predictor variables: disclosure (categorical), social support (continuous), exposure to violence (continuous), stressors (continuous), impulsivity (continuous), and depression (continuous). The outcome variable was a binary categorical variable, medication adherence to antiretroviral medication for HIV treatment. All participants in the sample had been diagnosed with depression by a clinician but had varying BDI scores. Additionally, patients recorded the number of major stressors experienced within the past year. As such, depression scores and stressors were included within the first block of the sequential regression model to control for the effects of these variables. Disclosure, social support, exposure to violence, and impulsivity were included in the second block of the sequential regression model. This model was utilized to analyze two subsets of the data which were subsequently created after the initial data screening in order to account for uneven groups in the dependent variable. Additionally, bivariate correlations were conducted to determine relationships between CD4 counts, social support, and exposure to violence and a one-way ANOVA was conducted to determine if significant mean differences existed between disclosure groups.

Data Collection

Data was collected by mental health clinicians from 2010-2016 at a large specialized clinic in Mexico City. The clinic serves individuals who are living with HIV and AIDS providing them with ART, psychological services, and a variety of other medical services. The clinic has no formal Institutional Review Board process in place in order to collect the data. In this clinic, mental health clinicians work and function as part of a separate mental health department with

their own set of protocol and work flow procedures. Most typically, patients arrive to the clinic to receive free HIV testing from the medical team. Once a patient has been diagnosed with HIV, the patient is sent for laboratory blood tests to obtain viral load and CD4 counts. The patient is also referred to the mental health program for a psychological evaluation, a brief intervention, and a treatment plan. The psychological evaluation consists of a comprehensive intake form and a battery of 6 assessments. The intake form and 2 of the 6 assessments are part of the current study and will be explained in more detail in the section regarding instrumentation. Other patients referred to the mental health program for evaluation are transgender-identified individuals who are both HIV-positive and HIV-negative, and HIV-positive individuals who have been diagnosed elsewhere prior to presenting to the specialized clinic. In the current data set, the researcher used a subset of individuals all diagnosed with HIV.

Participants

Sampling Criteria

The researcher used a sample from an archival data set which was based on specific criteria. The purpose of this study was not generalizability, but investigation of a specific population in a particular geographic region, of which this sample is representative. Inclusion criteria for this study was a diagnosis of HIV or AIDS, current prescribed antiretroviral medication regimen, sexually transmitted HIV, and a clinician diagnosis of depression. This resulted in a total of 601 participants to be included from the original data set which included data of 4,842 patients. In the data set containing 601 participants, the two groups of the dependent variable were uneven. As a result, two random samples were taken from the larger group ("adherent") and assigned to two smaller subsets including the full nonadherent group to

create two subsets of 146. This number was determined through a power analysis discussed in the next section.

Power Analysis

Power represents the ability to correctly reject a null hypothesis. It is a function of the magnitude of the effect, the probability level chosen for statistical significance, and the sample size used in the study (Keith, 2015). The researcher used G*Power 3.1 to determine the minimum sample size necessary to yield significant results in a sequential logistic regression analysis. For an analysis with a medium effect size (f^2) of .15, error probability (α) of .05, power (β) of .95, and six predictor variables, the power analysis indicated an optimal sample size of 146. According to Cohen (1988, 1992), researchers should achieve a minimum power of .80. The statistical power of the current study indicates that there was a 95% chance of detecting an effect if it existed.

Participant Demographics

All participants were patients at a specialized clinic in the center of Mexico City residing in one of Mexico City's 16 boroughs or in close proximity to the city limits. Of the 146 participants included in Data Set 1 of this study, 122 identified as male, 20 identified as female, and 2 identified as transgender female. Age ranged from 17-67. For marital status, 110 participants were single, 33 were married or partnered, and 3 were widowed. Regarding occupation, 44 of the participants were unemployed at the time of their intake. In terms of religion, 72 of participants identified as Catholic. Regarding sexual orientation, 101 of participants identified as homosexual, 12 as bisexual, and 30 as heterosexual. Lastly, 98 of participants had a detectable viral load at the time of their intake and 44 had an undetectable viral load.

Of the 146 participants included in Data Set 2 of this study, 130 identified as male, 15 identified as female, and 1 identified as transgender female. Age ranged from 17-64. For marital status, 115 participants were single, 29 were married or partnered, and 2 were widowed. Regarding occupation, 38 of the participants were unemployed at the time of their intake. In terms of religion, 72 of participants identified as Catholic. Regarding sexual orientation, 104 of participants identified as homosexual, 16 as bisexual, and 26 as heterosexual. Lastly, 93 of participants had a detectable viral load at the time of their intake and 50 had an undetectable viral load.

Instrumentation

Participants completed two assessments as part of their initial intake at the clinic which measured level of depression, and impulsivity. An intake form was also completed which included self-report demographic information, medical data collected from healthcare professionals at the clinic, and documentation of mental health disorders as diagnosed by mental health clinicians at the clinic.

Escala de Impulsividad Estado/State Impulsivity Scale (EIE/SIS)

The State Impulsivity Scale is 12-item Likert-scale assessment created and validated in Spain (Iribarren et al., 2011). The assessment, which is intended to measure an individual's level of impulsivity, views impulsivity not as a character trait, as have other assessments measuring this construct, but as a state or temporary condition. The measure was based on three theoretical notions including reward, automatism, and attention. Reward referring to impulses toward achieving an immediate reward, automatism referring to repetitive behaviors without reinforcement, and attention referring to premature response behaviors in situations where more information was needed to act appropriately. The items in the EIE/SIS use a Likert-type response

format ranging from 0-3 where 0 is "Almost Never", 1 is "Sometimes", 2 is "Often", and 3 is "Almost Always/Always". Language in the EIE/SIS was carefully constructed in order to avoid language framing impulsivity as a personality trait. Questions on the EIE/SIS include: "I seek activities where I obtain rapid pleasure, even if they are harmful", "I generally fall into temptations that make it hard for me to fulfill a commitment", "If I do something and do not obtain the results I expect, it is hard for me to do something else".

In order to test, validate, and standardize the instrument, the Iribarren et al. (2011) conducted three phases in the study. During the first phase, the questionnaire was administered to a sample of 110 participants from a community mental health center in Madrid. Problematic items were removed which resulted in a 20-item questionnaire. During the second phase, researchers established 3 groups: Impulsive Patients (IP), Non-Impulsive patients (NIP), and a Control Group (CG). Participants in the IP group were diagnosed by a psychiatrist as having at least one impulse control disorder as defined in the DSM-IV-TR. Participants in the NIP group were diagnosed with other psychiatric disorders. In the second phase, participants were administered the EIE/SIS along with the Barratt Impulsivity Scale (BIS-11), the Sensitivity to Punishment and Sensitivity to Reward (SPSR) Questionnaire, and the Sensation Seeking Scale (SSS). During the final validation stage, researchers obtained a sample of 293 participants which were categorized into the same three groups, IP, NIP, and CG. The principal diagnoses among the IP group were intermittent explosive disorder, pathological gambling, kleptomania, and borderline personality disorder. Among the NIP group, the principal diagnoses were major depression disorder, anxiety disorders, anorexia nervosa, schizophrenia, alcohol dependence, and somatoform disorder. The range of ages in the sample was 18-68 with the following means: IP

(M = 40.27), NIP (M = 38.23), CG (M = 31.97). Researchers compared the IP and NIP group and found no significant differences between age, gender, work situation, and educational level.

To measure reliability, researchers used a test-retest correlation which resulted in a Cronbach's alpha of α = .884 (F = 7.638, n = 293, p = 0.000) (Iribarren et al., 2011). Using the split-half method, researchers found strong internal consistency (r = .644, p = 0.000). Construct validity was analyzed with principal component factor analysis supported by Bartlett's test of sphericity and Kaiser-Meyer-Olkin test. The Kaiser-Meyer-Olkin measure of sampling adequacy was .982, above the commonly recommended value of .6 (Hutcheson & Sofroniou, 1999), and Bartlett's test of sphericity was significant (χ^2 (1913) = 5129, p < .05). Factorization was stopped after the extraction of three anticipated factors corresponding to the theoretical foundation of the instrument. The three factors, Reward, Automatism, and Attention explained 51.4%, (α = .840), 51.3% (α = .809), and 41.5% (α = .756) of the total variance, respectively. Convergent validity was assessed by correlating total scores of the EIE/SIS to the BIS, SPSRQ, and SSS. A strong correlation was found between the total scores of the EIE/SIS and total scores of the BIS (r = .612, p = .000). A significant correlation was found between the EIE/SIS and the SPSRQ subscale, Sensitivity to Reward (r = .452, p = .000) but not with the subscale Sensitivity to Punishment (r = .117, p = .072). A moderate relationship was found between total scores of the EIE/SIS and the SSS (r = .382, p = .008).

This instrument was subsequently adapted from the original version to fit the treatment needs of the specialized clinic in Mexico City. Researchers at the clinic determined that their adapted version was reliable and valid for HIV-positive patients in Mexico City achieving stronger coefficients than those found during the validation process in Spain. Researchers

determined the instrument's internal consistency to have a reliability (α) of .92 with mean inter-item correlations, *r* = .71, KMO = .93.

Beck Depression Inventory

The Beck Depression Inventory is a 21-item self-report questionnaire which is intended to measure the occurrence and severity of depressive symptoms (Beck, Steer, & Brown, 1996). This questionnaire has often been seen as the gold standard in the screening of depression. In a meta-analysis on the English version of the BDI-II, Erford, Johnson, and Bardoshi (2016) review psychometric properties of the BDI-II including the test-retest reliability, convergent validity, structural validity, and diagnostic validity based on this review of the literature and previous studies.

Many studies have been conducted on the BDI-II which have examined the psychometric properties of this instrument. eck, Steer, and Brown (1996) administered the instrument to 500 outpatients and 120 college students. It was determined that the BDI-II had high internal consistency across both groups, college students (α = .93) and outpatients (α = .92). When using a sample of 26 participants from the outpatient group, the instrument demonstrated excellent test-retest reliability (*r* = .93). In the meta-analysis of the BDI-II, Erford, Johnson, and Bardoshi (2016) combined a total of 99 studies to analyze internal consistency of the instrument. With a combined sample size of 31,413, internal consistency averaged α = .907 in clinical samples. To examine test-retest reliability, 12 studies were combined for a total sample of 1,562 which resulted in a test-retest reliability of r_{tt} = .75. In clinical samples (*n* = 572), researchers found an average r_{tt} of .68.

Researchers compared the BDI-II to 43 other depression inventories (Erford, Johnson, & Bardoshi, 2016). Of the 43 depression inventories included in their analyses, three instruments

provided more than three convergent comparisons with the BDI-II: Center for Epidemiological Studies-Depression, $r = .72$ (Radloff, 1977); Hamilton Depression Inventory, $r = .74$ (Hamilton, 1960); and the Zung Depression Rating Scale, $r = .53$ (Zung, Richards, Gables, & Short, 1965). Important to note is that the BDI-II is a criterion-referenced instrument used as a screening tool to assist in the diagnosis of depression. Since it is a criterion-referenced instrument, the BDI-II may be culturally biased. Its diagnostic validity may be variable dependent on the population with which it is utilized (Drew, 1973; Erford, Johnson, & Bardoshi, 2016). While the BDI-II has been adapted across settings to be interpreted at differing cut-off scores for depression, Beck, Steer, and Brown (1996) suggested the following interpretations: 0-13 as minimal, 14-19 as mild, 20-28 as moderate, and 29-64 as severe.

The BDI-II has been translated to a multitude of languages worldwide, including Spanish. In Mexico, an adaptation of the BDI-II was piloted and validated using a sample of students from across Mexico and a sample of adults from the community in Mexico City (González, Reséndiz, & Reyes-Lagunes, 2015). Both the sample of students ($\alpha = .92$) and adults from the community ($\alpha = .87$) had high levels of internal consistency. A factorial analysis resulted in a three-factor model which has been supported in English-speaking populations (Osman, Barrios, Gutierrez, Williams, & Bailey, 1997). This model may even be a more appropriate fit for use in the Mexican population since specific items pertaining to affective characteristics which did not have strong loadings on cognitive or somatic factors were separated (González et al., 2015; Ward, 2006).

Evaluación de Primera Vez de Salud Mental – V9/Mental Health Intake Evaluation Form

The specialized clinic in Mexico City developed a comprehensive intake form for utilization in their mental health program. The intake form was part of the initial assessment at

the clinic upon referral to the mental health program. The intake questionnaire was predominantly self-report with demographic items as well as questions addressing psychosocial concerns pertinent to HIV/AIDS illness and treatment. Demographic items included age, gender, marital status, living situation, work situation, religion, chronic illness, and mode of HIV transmission. Psychosocial concerns addressed include violence and assault, mental health diagnosis, stressors experienced within the last year, family history of mental health issues, previous psychological treatment, suicidality, medication regimen and adherence, disclosure to family members, and social support. Included in the initial evaluation are items which ask for viral load and CD4 counts. These measures were obtained by laboratory blood work during the initial visit. Additionally, the mental health clinician completing the evaluation provided a mental health diagnosis or indicated that the patient did not have a diagnosable psychiatric disorder.

<h2 style="text-align:center">Procedure</h2>

In this section, the data cleaning process is discussed. The proposed analysis and associated assumption checking are also described in this section. Finally, threats to internal and external validity and other limitations to methodology are reviewed.

Data Cleaning

The current data set obtained from the clinic contained information from 4,842 patients. To fit the purpose and goals of this study, the researcher focused on a subset of the data based on specific criteria. The criteria included a diagnosis of HIV or AIDS, current prescribed antiretroviral medication regimen, sexually transmitted HIV, and a clinician diagnosis of a mental health disorder. First, a new data set was created, including all participants who have been diagnosed with one of the following mental illnesses by a clinician at the clinic: major

depression, generalized anxiety disorder, schizophrenia, personality disorder, post traumatic stress disorder, adjustment disorder, and bipolar disorder. Cases were removed for patients who had not been transmitted HIV sexually and who were not currently prescribed an antiretroviral medication regimen at the time of intake. A missing values analysis was conducted for all variables included in the analyses to determine if more than 5% of the values are missing. Cases in which more than 25% of responses on EIE/SIS or BDI are missing were removed and missing data was imputed using expectation maximization. The reduction of the data set resulted in a final total of 601 participants.

Prior to running the analysis, assumptions for sequential logistic regression were checked. There must be one dichotomous dependent variable, in this case medication adherence which is categorized into "Yes" and "No" (Tabachnick & Fidell, 2008). There must be one or more independent variables, either continuous or nominal scale (Tabachnick & Fidell, 2008). Observations and categories of the dichotomous dependent variable must be independent and nominal independent variables should be mutually exclusive and exhaustive (Statistics.laerd.com, 2013). Independent variables were checked to confirm a minimum of 15 cases per independent variable to avoid an overfit model (Stoltzfus, 2011). The researcher also checked the assumption of linearity which requires a linear relationship between the continuous independent variables and the logit transformation of the dependent variable. This assumption was checked using the Box-Tidwell approach (Box & Tidwell, 1962). The researcher inspected correlation coefficients to check for absence of multicollinearity, to report whether independent variables were highly correlated with one another. Multicollinearity arises when numerous independent variables correlate with one another at an exceptionally high level or when an independent variable is a near linear combination of other independent variables (Keith, 2015).

This is problematic and could lead to misleading results and the inability to separate the effects of the predictor variables. Lastly, the data was screened for significant outliers which could influence the impact the data has on the regression line.

Analysis

Data analyses were conducted with SPSS software version 25. For the first research question, a correlational analysis was conducted in order to examine the relationships between the continuous variables social support, violence, and CD4 counts. Next, an ANOVA was conducted to estimate the mean differences in CD4 counts among disclosure groups. For research question two, a logistic regression model was utilized to estimate the contribution of each predictor variable while simultaneously taking other predictor variables into account and was tested across two groups, each composed of the smaller nonadherent group and a random sample of the adherent group due to the unbalanced levels in the outcome variable. This strategy was utilized in order to assess the generalizability of the model (Chan, 2004; Katz, 1999). The analyses were conducted in two steps into which BDI scores and stressors were entered first followed by psychosocial variables of interest to identify the influence of depression and stress before taking other possible risk factors for medication nonadherence into account.

Logistic regression allows one to predict a discrete outcome from a set of variables that may be continuous, discrete, or dichotomous (Tabachnick & Fidell, 2008). It is a popular analysis used in health sciences as it allows researchers to test for a discrete outcome such as adherence/nonadherence based on a number of predictor variables. Additionally, logistic regression is a flexible analysis in which assumptions of distribution normality do not exist (Tabachnick & Fidell, 2008). In this study, the variables of interest included disclosure of HIV status to family members (predictor variable, nominal), social support (predictor variable,

continuous), exposure to violence (predictor variable, continuous), impulsivity (predictor variable, continuous), BDI scores (predictor variable, continuous), number of stressors experienced within the past year (predictor variable, continuous), and medication adherence (outcome variable, nominal). Sequential logistic regression was a useful analysis to show how much of the variance in the dependent variable, medication adherence, is explained by the predictor variables (disclosure, impulsivity, exposure to violence, social support) after controlling for number of stressors experienced within the past year and BDI scores (Field, 2017). The order variables entered into the sequential regression model should be based on previous literature (Heppner, Wampold, & Kivlighan, 2008; Tabachnick & Fidell, 2008). Since much of the literature on the relationship between medication adherence and psychosocial factors in HIV/AIDS patients is inconsistent, contradictory, and variable dependent on the specific population, the researcher aimed to create a regression model to examine the effects of specific psychosocial factors among HIV/AIDS patients at the clinic in Mexico City based on the Transactional Model of Stress and Coping (Lazarus & Folman, 1984).

Due to the nature of medication being a self-report measure, it is likely that nonadherence was underreported resulting in a skewed representation of the groups in the dependent variable. Due to the imbalanced nature of the groups in the dependent variable, medication adherence, two random samples were taken from the adherent group in order to achieve balanced group sizes in the dependent variable. By running two separate logistic regressions, a wider range of the adherent group was examined. Additionally, the rationale for randomly selecting cases from the adherent group was to ensure that statistical power, according to a priori analyses, was reached.

Threats to Internal and External Validity

Important to understanding the validity of the study, it is vital to review the threats to internal and external validity existent due to the study design and methodology. Having a better understanding of these threats guides the researcher to draw valid conclusions about research questions by generating alternative explanations for the study's results (Heppner, Wampold, & Kivlighan, 2008). These considerations of validity are important for those who design, conduct, and consume research. The researcher intended to consider these threats to internal and external validity with the expectation that relatively valid conclusions resulted from the analyses.

Internal validity is the extent to which the study design supports the possibility that variances in the predictor variables caused a difference in the dependent variable. Since the current study was non-experimental correlational research, the study had low internal validity due to lack of researcher manipulation and lack of attributable causation (Heppner, Wampold, & Kivligahn, 2008). External validity refers to the generalizability of a study's results to the population and across populations (Cook & Campbell, 1979; Heppner, Wampold, & Kivligahn, 2008). This study had good external reliability as the results from this sample could apply directly the population. However, generalizability may not be applicable across groups as evidenced by the inconsistencies in HIV/AIDS literature in terms of the relationships between psychosocial factors and social support. Lastly, since much of the data was derived from self-report measures, the data was vulnerable to influence of response bias, especially since patients may had felt pressured by stigma, the urgency of medication adherence, and other aspects relating to the diagnosis of HIV/AIDS.

Summary

This chapter focused on the purpose of the study, the research design, and the data collection process. Additionally, information regarding the sampling process and instrumentation

used in the study was provided. The data analysis procedure and associated threats to external

and internal validity was discussed.

CHAPTER FOUR

RESULTS

The purpose of this study was to investigate the relationship between disclosure of HIV status to family members, social support, impulsivity, exposure to violence, and medication adherence among a sample of HIV-positive individuals in Mexico City. This study aimed to add to the existing body of literature focusing on issues in HIV and AIDS care as well as literature focusing on interprofessional collaboration research. In the analysis, this study controlled for factors known to contribute to medication adherence based on previous research, specifically major life stressors and depression. In this chapter, the researcher reviewed the results of the statistical analyses from the current study, including more detail regarding data cleaning and preliminary assumption checking analyses.

Data Screening and Preparation

The data were screened for inclusion criteria, data entry errors, missing values, and the assumptions for the logistical regression analyses resulting in 601 valid cases (or participants). Within the valid cases, 533 of the participants indicated adherence to their medications and 68 indicated nonadherence creating unequal groups in the outcome variable. Unequal groups in the outcome variable potentially can lead to skewed probabilities in the analysis which would in turn compromise the predictions calculated by the logistic regression. To adjust for the unequal groups, the nonadherent group, which was the smaller group consisting of 68 individuals was copied into two separate data sets, called Data Set 1 and Data Set 2. To create two whole data sets ready for analysis, two random samples of 78 participants were taken from the larger adherent group containing 533 participants. Two samples were taken so that each group of 78 participants could be assigned to one of the newly created subsets of data. Now each data set

included 146 participants. This was done in attempts to best represent the characteristics of the full data set and also to ensure minimum sample size required according to an a priori G*Power analysis.

Recoding

Violence, stressors, and disclosure responses were gathered via intake questionnaire checklists. For example, participants were asked whether they had experience psychological, emotional, physical, or economic abuse during the course of their lifetime. This variable was recoded as an ordinal variable ranging from 0-4 where 0 indicated no exposure to violence, and 4 indicated exposure to each of the types of violence listed in the questionnaire. Stressors experienced during the past year was included as a checklist of 7 different stressors on the intake evaluation which was coded as an ordinal variable in the data set where 0 indicated no exposure to major stressors and 7 indicated exposure to all stressors listed in the questionnaire. Two variables in the data set corresponded to disclosure to family of HIV or AIDS status. These variables were transformed to create a new variable which was coded as 0 for no disclosure to family of HIV status, 1 for disclosure to family with reaction of support, 2 for disclosure to family with reaction of rejection, and 3 for disclosure to family with reaction of indifference. BDI and EIE scores were aggregated to form sum variables for each of the scales. BDI, EIE, and social support variables did not need further coding or transformation as they are continuous scale variables.

Data Analysis

Data analyses were conducted with SPSS software version 25. The two research questions involved checking for assumptions and recoding variables if necessary. For the first research question, a correlational analysis was conducted in order to examine the relationships

between the continuous variables social support, violence, and CD4 counts. Next, an ANOVA was conducted to estimate the mean differences in CD4 counts among disclosure groups. For research question two, a logistic regression model was utilized to estimate the contribution of each predictor variable while simultaneously taking other predictor variables into account and was tested across two groups, each composed of the smaller nonadherent group and a random sample of the adherent group due to the unbalanced levels in the outcome variable. This strategy was utilized in order to assess the generalizability of the model (Chan, 2004; Katz, 1999). The analyses were conducted in two steps into which BDI scores and stressors were entered first followed by psychosocial variables of interest to identify the influence of depression and stress before taking other possible risk factors for medication nonadherence into account

Research Question One: What is the relationship between CD4 counts and violence, disclosure, and social support?

For the first research question, a correlational analysis was conducted in order to examine the relationships between the continuous variables social support, violence, and CD4 counts. Next, an ANOVA was conducted to estimate the mean differences in CD4 counts among disclosure groups. Prior to running correlational analyses, data was screened to determine if a linear relationship existed between the variables. Data was also screened for normality. The researcher used SPSS to construct scatterplots and boxplots and to compute normality tests. The violence, social support, and CD4 variables were determined not to be normally distributed according to the Shapiro-Wilk's test ($p < .05$). Due to non-normality of the data and monotonicity as observed in the produced scatterplots, a Spearman correlation was conducted on the three variables.

Using SPSS, Spearman correlations were utilized to determine if a relationship existed among violence, social support, and CD4 counts. Specifically, the researcher aimed to identify relationships between violence and CD4 counts and social support and CD4 counts. In Data Set 1, the analysis showed a significant small positive correlation between violence and CD4 counts ($r_s = .189$, $p < .05$). In Data Set 2, neither violence nor social support were found to have statistically significant relationships with CD4 counts.

Table 1. Correlation Coefficients (Spearman Correlation) of Violence, Social Support, and CD4 Variables for Data Set 1.

	Violence	Social Support	CD4
Violence	-		
Social Support	-.212*	-	
CD4	.189*	.055	-

Table 2. Correlation Coefficients (Spearman Correlation) of Violence, Social Support, and CD4 Variables for Data Set 2.

	Violence	Social Support	CD4
Violence	-		
Social Support	-.272*	-	
CD4	.112	.036	-

Prior to running the ANOVA to determine mean differences across disclosure groups, assumptions were checked. Assumptions of a one-way ANOVA are a continuous dependent variable, a categorical independent variable with two or more independent groups, independence of observations, no significant outliers in the groups of the independent variable in terms of the dependent variable, a normally distributed dependent variable for each group of the independent

variable, and a dependent variable with a normal distribution. SPSS was utilized to construct boxplots for each disclosure group and determined that there were no significant outliers among each of the groups. A Shapiro-Wilk's test determined that two groups (No Disclosure and Acceptance from Family) were not normally distributed ($p < .05$) and the groups corresponding to individuals who were rejected by family and whose families were indifferent to their disclosure were approximately normally distributed ($p > .05$). A one-way ANOVA was conducted to determine estimates of mean differences between disclosure groups on their CD4 counts. The analysis determined that there were no statistically significant mean differences in CD4 counts between the groups.

Research Question Two: To what extent do disclosure, social support, impulsivity, and exposure to violence predict medication adherence in HIV-positive individuals after controlling for depression and major stressors experienced within the past year?

Screening of the data was performed separately to check for missing data, outliers, linearity, and multicollinearity. The assumptions for logistic regression are the presence of one dichotomous dependent variable, the presence of one or more independent variables of continuous or nominal scale, independence of observations and categories of the dichotomous dependent variable, mutually exclusive and exhaustive nominal independent variables, linearity in the logit, the absence of multicollinearity, the absence of outliers in the solution, and independence of errors.

The first assumption is the presence of one dichotomous dependent variable which is met by the binary dependent variable medication adherence (0 = adherent; 1 = nonadherent). Next, there are several independent variables in the study which are continuous or nominal. Observations and categories of the dependent variable are independent of one another and the

sole nominal independent variable, disclosure to family of HIV status, is mutually exclusive and exhaustive.

Logistic regression assumes a linear relationship between continuous predictors and the logit transformation of the dependent variable. To test for linear relationships between the continuous predictor variables and the dependent variable, medication adherence, the Box-Tidwell approach was utilized (1962). In the Box-Tidwell approach, interaction terms between each predictor and its natural logarithm, are created and added to the logistic regression model to screen for the violation of the assumption of linearity.

The first step of the Box-Tidwell approach was to compute the natural logit transformation for each of the continuous independent variables using the compute variable function in SPSS. After computing the natural logit transformation for social support, violence, EIE aggregate score, BDI aggregate score, and stressors, a logistic regression needed to be run to examine the presence of linearity. For this analysis, each predictor variable, including the nominal variable disclosure, was added as a covariate in the analysis. Next, interaction terms were created for each pair of continuous variable and their respective natural logit transformation variable. This resulted in twelve terms in the model including six predictor variables, five interaction terms, and the intercept. A Bonferroni correction was applied using all 12 terms in the model resulting in statistical significance being accepted when $p < .00417$ (Tabachnick & Fidell, 2014). This number is calculated by dividing the accepted value of statistical significance (p = .05) by the number of terms in the analysis. Based on this analysis, all continuous independent variables were found to be linearly related to the logit of the dependent variable. See Table 3 and Table 4 for detailed information regarding the analysis for checking this assumption.

Table 3. Assumption Checking for Linearity of Data Set 1 Data.

Interaction Terms	B	S.E.	Wald	df	Sig.	Exp(B)
LnViolence*Violence	-2.427	3.078	.622	1	.430	.088
LnStressors*Stressors	3.004	2.266	1.757	1	.185	20.157
LnSocialSupport*SocialSupport	1.117	2.027	.304	1	.582	3.056
LnEIE*EIE	.304	.182	2.800	1	.094	1.355
LnBDI*BDI	.757	1.572	.232	1	.630	2.133

Table 4. Assumption Checking for Linearity of Data Set 2 Data.

Interaction Terms	B	S.E.	Wald	df	Sig.	Exp(B)
LnViolence*Violence	.383	.508	.570	1	.450	1.467
LnStressors*Stressors	-3.232	2.618	1.524	1	.217	.039
LnSocialSupport*SocialSupport	-2.478	2.171	1.302	1	.254	.084
LnEIE*EIE	.888	.626	2.014	1	.156	2.431
LnBDI*BDI	-.207	.506	.167	1	.682	.813

The researcher inspected correlation coefficients to check for absence of multicollinearity to report whether independent variables were highly correlated with one another. Multicollinearity arises when numerous independent variables correlate with one another at an exceptionally high level or when an independent variable is a near linear combination of other independent variables (Keith, 2015). This is problematic and could lead to misleading results and the inability to separate the effects of the predictor variables. To check the assumption of multicollinearity, a linear regression analysis was run to observe tolerance values, variance

inflation factors (VIF), eigenvalues, condition indices, and variance proportions. According to

Field (2017), if eigenvalues in the collinearity diagnostics table produced by SPSS are much

larger than others, the uncentered cross-products matrix is ill-conditioned. This means that the

solutions of the regression parameters can be greatly affected by small changes in the predictor

variables. Additionally, it is suggested that tolerance values less than .1 and VIF values greater

than 10 indicate a potential problem with collinearity (Field, 2017; Menard, 1995; Myers, 1990).

In the results of the regression analysis of the continuous variables in Data Set 1,

tolerance and VIF coefficients indicate an absence of multicollinearity with tolerance values

ranging from .540-.966. Values of VIF ranged from 1.035-1.853. In the results of the regression

analysis of the continuous variables in Data Set 2, tolerance and VIF coefficients indicate an

absence of multicollinearity with tolerance values ranging from .476-.980. Values of VIF ranged

from 1.074-2.126. See Tables 5 and 6 for tolerance and VIF values of each variable.

Table 5. Collinearity Statistics for Data Set 1.

Predictor Variables in the Model	Tolerance	VIF
Violence	.838	1.193
Disclosure	.966	1.035
Social Support	.914	1.094
Depression (BDI)	.551	1.814
Impulsivity (EIE)	.540	1.853
Stressors	.893	1.120

Table 6. Collinearity Statistics for Data Set 2.

Predictor Variables in the Model	Tolerance	VIF

Violence	.861	1.161
Disclosure	.980	1.021
Social Support	.911	1.097
Depression (BDI)	.475	2.105
Impulsivity (EIE)	.470	2.126
Stressors	.931	1.074

In regards to collinearity diagnostics, variance proportions must be analyzed for each regression coefficient which can be broken down into eigenvalues. The variance proportions indicate the proportion of the variance of each predictor's regression coefficient that is attributed to each eigenvalue. To determine if collinearity is present, it is important to ascertain whether there are high proportions for more than one variable on the same small eigenvalue. If this were the case, this would indicate that the variances of the regression coefficients are dependent. For Data Set 1, this analysis showed that variance proportions across eigenvalues for the six predictor variables did not reveal problematic results, indicating an absence of multicollinearity. However, in Data Set 2, this analysis showed that for BDI scores 91% of the variance of the regression coefficient is associated with eigenvalue number 7 and 72% of the variance of the regression coefficient EIE scores is associated with the same eigenvalue. Since these predictors have high proportions on the same small eigenvalue, it indicates that the variances of their regression coefficients may be dependent. See Table 7 and Table 8 for more details of this analysis.

Table 7. Collinearity Diagnostics for Data Set 1.

			Variance Proportions						
Dimension	Eigenvalue	Condition Index	Constant	Violence	Disclosure	Social Support	BDI	EIE	Stressors
1	4.739	1.000	.01	.01	.01	.01	.01	.01	.01
2	.762	2.494	.00	.07	.00	.42	.03	.03	.01
3	.481	3.140	.00	.35	.04	.03	.11	.09	.12
4	.412	3.392	.01	.00	.55	.01	.00	.01	.40
5	.332	3.778	.00	.54	.16	.24	.00	.00	.41
6	.149	5.635	.35	.01	.09	.12	.28	.67	.00
7	.125	6.151	.63	.01	.15	.16	.58	.20	.04

Table 8. Collinearity Diagnostics for Data Set 2.

			Variance Proportions						
Dimension	Eigenvalue	Condition Index	Constant	Violence	Disclosure	Social Support	BDI	EIE	Stressors
1	4.685	1.000	.01	.01	.01	.01	.01	.01	.01
2	.778	2.454	.00	.04	.00	.43	.02	.03	.03
3	.530	2.974	.00	.23	.04	.05	.03	.03	.43
4	.423	3.330	.00	.07	.64	.04	.03	.05	.07
5	.355	3.632	.00	.62	.13	.19	.00	.00	.39
6	.126	6.106	.91	.01	.17	.26	.00	.19	.07
7	.103	6.738	.08	.01	.00	.02	.91	.70	.00

To further explore this assumption, the researcher analyzed bivariate correlations of the predictor variables to screen for strong relationships between variables. Pearson correlations showed a moderate positive correlation between EIE scores and BDI scores in Data Set 1 ($r = .661$, $n = 146$, $p = .000$). Pearson correlations showed a moderate correlation between EIE scores and BDI scores in Data Set 2 ($r = .719$, $n = 146$, $p = .000$). This correlation between the two variables indicates a potential violation of the assumption of multicollinearity although VIF and tolerance values may indicate that the effect on the model is moderate to low. See Tables 9 and 10 for full correlational analysis of the predictor variables.

Table 9. Correlation Coefficients (Pearson Correlation) of Psychosocial Predictor Variables for Data Set 1.

	Violence	Stressors	Disclosure	Social Support	EIE	BDI
Violence						
Stressors	.243**					
Disclosure	.171*	.092				
Social Support	-.185*	.106	-.020			
EIE	.261**	.184*	.084	-.164*		
BDI	.243**	.092	.049	-.193*	.661**	

Note. *= ($p \leq .05$); **= ($p < .001$)

Table 10. Correlation Coefficients (Pearson Correlation) of Psychosocial Predictor Variables for Data Set 2.

	Violence	Stressors	Disclosure	Social Support	EIE	BDI
Violence						
Stressors	.231**					
Disclosure	.125	.021				

Social Support	-.158	.079	-.017		
EIE	.247**	.014	.067	-.234**	
BDI	.210*	.032	.089	-.242**	.719**

Note. *= ($p \le .05$); **= ($p < .001$)

For research question two, a logistic regression model was utilized to estimate the contribution of each predictor variable while simultaneously taking other predictor variables into account and was tested across two groups, each composed of the smaller nonadherent group and a random sample of the adherent group due to the unbalanced levels in the outcome variable. This strategy was utilized in order to assess the generalizability of the model (Chan, 2004; Katz, 1999). The analyses were conducted in two steps into which BDI scores and stressors were entered first followed by psychosocial variables of interest to identify the influence of depression and stress before taking other possible risk factors for medication nonadherence into account.

The researcher conducted two two-step binary logistic regression analyses to determine if the addition of disclosure of HIV status to family members, exposure to violence, social support, and impulsivity improved the prediction of medication adherence over depression and stressors experienced over the past year. The dependent variable for the analyses was medication adherence, self-reported during an intake questionnaire. Stressors experienced in the past year and depression scores as measured by the BDI were entered into the first block of the model as control variables. Disclosure of HIV status to family members, impulsivity as measured by the EIE, exposure to violence, and social support were entered into the second step of the model. See Table for details on the full regression model. With regard to the full model, variables that were statistically significant for both Data Set 1 and Data Set 2 are considered to robustly predict the medication adherence outcomes (Cohen, Cohen, West, & Aiken, 2003).

Logistic regression analyses were computed separately for each random sample of the adherent group that was taken and will be referred to Data Set 1 and Data Set 2, respectively. The omnibus test for Step 1 of the analyses yielded a nonsignificant Hosmer and Lemeshow test for Data Set 1 $\Box^2(8) = 11.775$, p > .05, and Data Set 2 $\Box^2(8) = 5.098$, p > .05. This indicates that the overall model fit of the psychosocial predictor variables was statistically reliable in predicting medication adherence at the time of intake. The Negelkerke R^2 for Step 1 variables was .154 for Data Set 1 and for Data Set 2 was .120, indicating small effect sizes for the associations between the selected psychosocial variables and medication adherence. In these analyses, depression as measured by the BDI scores was a significant predictor of medication adherence in both groups. The value of Exp(B) indicated that the odds of nonadherence to HIV medication increased 8.9% for every 1 point increase in BDI scores in Data Set 1 [Exp(B) = 1.089, 95% CI =1.040-1.140] and by 8.6% in Data Set 2 [Exp(B) = 1.086, 95% CI = 1.036-1.140].

In Step 2, selected psychosocial variables were entered into the regression analyses for the two groups. The results of the Hosmer and Lemeshow test indicated that the overall model fit of the six variables was statistically reliable in distinguishing between adherence or nonadherence to ART at the time of intake evaluation in both Data Set 1 $\Box^2(8) = 6.345$, $p = .609$, and Data Set 2 $\Box^2(8) = 13.870$, p = .085. The Nagelkerke R^2 for Data Set 1 was .240 and for Data Set 2 was .197, indicating that the full model explained 24% and 19% of the variation in the outcome variable of Data Set 1 and Data Set 2, respectively. The inclusion of the psychosocial variables in Step 2 resulted in an increase of 4.8% and 2.8%, respectively, in variance accounted in the prediction of medication adherence beyond the variance accounted by Step 1 variables only. The overall accuracy of the model to predict participants to be nonadherent at the time of

intake evaluation was 69.2% in Data Set 1 and 65.8% in Data Set 2. In Data Set 1, the model

correctly classified 82.1% of participants who were adherent and 54.4% of participants who were

nonadherent. In Data Set 2, the model correctly classified 74.4% of participants who were

adherent and 55.9% of participants who were nonadherent. In these analyses, none of the

psychosocial factor variables were found to be a significant predictor of medication adherence in

both groups. However, impulsivity scores as measured by the EIE were found to be significantly

and positively related to medication nonadherence in Data Set 1 and exposure to violence was

found to be significantly and positively related to medication nonadherence in Data Set 2. For

complete statistics of binary logistic regression analyses for both groups, see Table 11 and 12.

Table 11. Binary Logistic Regression Coefficients of Data Set 1.

	B	*SE*	Wald	*df*	Sig.	Exp(*B*)
Stressors	.071	.189	.142	1	.706	1.074
BDI	.038	.031	1.536	1	.215	1.039
EIE	.052	.026	3.973	1	.046	1.053
Disclosure No Disclosure (Reference)			4.700	3	.195	
Support	.056	.462	.015	1	.904	1.058
Rejection	-1.105	.795	1.930	1	.165	.331
Indifference	.681	.588	1.341	1	.247	1.975
Violence	.266	.175	2.305	1	.129	1.305
Social Support	-.041	.062	.439	1	.508	.960
Constant	-1.316	.485	7.348	1	.007	.268

Table 12. Binary Logistic Regression Coefficients of Data Set 2.

	B	*SE*	Wald	*df*	Sig.	Exp(*B*)
Stressors	.011	.156	.005	1	.946	1.011
BDI	.035	.035	1.004	1	.316	1.036
EIE	.044	.028	2.416	1	.120	1.045
Disclosure No Disclosure (Reference)			3.321	3	.345	
Support	.681	.455	2.237	1	.135	1.975
Rejection	-.469	.864	.294	1	.588	.626
Indifference	.323	.517	.390	1	.532	1.381
Violence	.358	.176	4.118	1	.042	1.431
Social Support	.001	.063	.000	1	.985	1.001
Constant	-1.768	.518	11.653	1	.001	.171

Summary

The results of the analyses provide varying levels of support for the research questions. The first research question explored the relationship between the CD4 counts, violence and social support. The second research question explored the relationship between various psychosocial factors including exposure to violence, disclosure of HIV status to family members, impulsivity, and social support with medication adherence when controlling for stressors experienced during the past year and depression.

CHAPTER FIVE

DISCUSSION

Chapter One provided an overview of the dissertation study including the problem statement, the purpose of the study, and terms and definitions specific to the current study. Chapter Two provided a review of the literature regarding HIV and AIDS in the world, the United States, and Mexico as well as the relationship between HIV/AIDS and physical and mental health. Chapter Three discussed the methodology utilized in the study which included the research design, data screening, and data analysis procedures. Chapter Four presented the results of the analyses. Chapter Five will provide a summary of the study as well as discuss the findings, relevance of the findings to existing literature, implications, and limitations of the study.

Review of the Study

The aim of this study was to investigate the relationship between impulsivity, social support, disclosure of HIV-positive status to family members, exposure to violence and medication adherence. The purpose of this study was to add to the existing body of literature regarding medication adherence among HIV-positive patients while highlighting psychosocial factors which have the potential to impact adherence behaviors. Further, this study controlled for depression and life stressors which have found to be predictive of adherence behaviors and poor health behaviors in previous studies. The researcher hopes to support the mission of the Clínica Especializada Condesa to establish streamlined care and best practices for the treatment of their patients and to also support the need for counselor interventions in mental health programs targeting the treatment of HIV-positive individuals.

The researcher conducted this study using an archival data set comprised of data collected by researchers and medical staff at the Clínica Especializada Condesa of Mexico City.

The final data set used for this dissertation included 601 participants from which two subsets were created, each containing 146 participants. Ages of participants ranged from 17-67 years. Participants completed intake questionnaires including questions regarding experiences of violence throughout the lifetime, disclosure of HIV status to family members, social support, life stressors experienced over the past year, and various other demographics including age, sexual orientation, gender, borough of residence, employment status, and household information. Participants also completed assessments regarding impulsivity, depression, substance use, and physical and mental health functioning. Medical professionals recorded information derived from laboratory blood samples such as CD4 counts and viral loads. Mental health professionals recorded mental health diagnoses based on their clinical judgement using the DSM. The researcher conducted bivariate correlations, a one-way ANOVA, and two hierarchical logistic regressions to address the research questions.

Major Findings

The results of this study contribute to the extensive body of literature already in existence in the field of HIV and AIDS medication adherence research. The findings include varying levels of support for the research questions and hypotheses.

Research Question One

Bivariate correlations were conducted to investigate the relationships between CD4 cell counts and social support and exposure to violence. Results varied in the relationships between Data Set 1 and Data Set 2. In Data Set 1, the correlations showed a significant positive correlation between violence and CD4 counts, indicating that as violence increased, CD4 counts increased. The relationship between social support and CD4 was not statistically significant. In Data Set 2, the analysis resulted in no statistically significant correlations between neither social

support and CD4 nor violence and CD4. Therefore, researchers failed to reject the null hypotheses for this analysis. The hypotheses predicted a positive relationship between CD4 counts and social support and negative relationship between CD4 counts and exposure to violence.

A one-way ANOVA was conducted to examine the differences in CD4 counts between disclosure groups (no disclosure, family accepted, family rejected, family indifferent). In both Data Set 1 and Data Set 2, there were no significant differences between the four disclosure groups indicating a failure to reject the null hypothesis.

Research Question Two

A sequential logistic regression was conducted to examine the relationship between exposure to violence, impulsivity, social support, disclosure to family and medication adherence when controlling for depression scores and stressors experienced within the past year. In support of the research question, the model tested in both Groups One and Two were found to be significant overall. While there were no factors which were found to be significant predictors of medication adherence in both groups, impulsivity was found to be a significant predictor of medication nonadherence in Data Set 1 and exposure to violence was found to be a significant predictor of medication nonadherence in Data Set 2. Because neither variable was found to robustly predict medication adherence (resulting in significance in both data sets), the researcher failed to reject the null hypothesis for this research question. While the model controlled for stressors and depression, stressors were not found to a be a significant predictor of medication nonadherence in either group while depression was statistically significant in each group. While neither impulsivity nor exposure to violence were significant across both groups, this

information is noteworthy in the consideration of this population and in their treatment as medication adherence has significant implications for HIV-positive patients.

Supportive Findings

This research suggests that both increased exposure to violence and higher scores on a scale measuring impulsivity are predictive of increased probability of nonadherence to ART. Medication adherence is vital for improving health outcomes with physicians emphasizing 80-95% adherence for optimal health outcomes. However, physicians treating and researching HIV, specifically, suggest 95-100% adherence to ART in order to prevent replication of HIV in the bloodstream, to strengthen the functioning of the immune system, to lower the likelihood of transmission, and to decrease the odds of developing drug resistant strains (National Institutes of Health, 2017a; Osterberg & Blaschke, 2005; Smith et al., 2003).

Previous research has supported the association between violence and nonadherence to medication among HIV-positive individuals. While the probability of medication nonadherence significantly increased in only one of the subsets in this study, interpersonal violence has been associated with increased mental health issues including PTSD and depression and has also been associated with medication nonadherence in several studies found in the literature (Blashill et al., 2011). The current study included participants who had experienced physical, psychological, and emotional abuse. This is consistent with studies that have found higher levels of nonadherence to ART among individuals who have experienced intimate partner violence, interpersonal violence, sexual abuse, and verbal abuse (Campbell et al., 2016; Lopez et al, 2010; Pantalone et al., 2010; Ramachandran et al., 2010). Important to mention is also the relationship between ethnic groups and experiences of violence throughout the lifetime. While the sample in the study was an international sample comprised entirely of Mexican nationals, in the United States it has been

found that rates of childhood abuse seem to be higher in Latino MSM when compared to non-Latino MSM. This information is relevant especially since child abuse and violence are prevalent among ethnic minorities, including Latino/as (Balsam et al., 2010; Feldman & Meyer, 2017). This finding is important since research supports a connection between early childhood traumas and risky-behaviors later in life.

Contradictory Findings

As was found during a review of the literature documented in Chapter Two of this dissertation, literature regarding the study of medication adherence in HIV-positive populations contains contradictory findings. This study did not find any significant results in the relationships between medication adherence, social support, and disclosure of HIV status to family members. Although there were no significant findings in this study, it is important to not dismiss these factors. Non-significant findings could be due to the limitations discussed later in this section or due to nuances of the specific population targeted for this investigation.

Social support has long been explored as a component in health outcomes for individuals with chronic illness. For individuals with HIV and AIDS, social support and disclosure to family and loved ones may be complexly interrelated. Individuals may disclose their HIV-positive status to strengthen their relationships and to gain support from others but may also avoid doing so due to fear of conflict and rejection (Chaudoir et al., 2011). Several studies have shown the connection between disclosure of HIV status, decreased symptoms of depression, and improved immune functioning (Hays et al., 1993; Sherman et al., 2000; Strachan et al., 2007). Yet disclosure of HIV-positive status may increase stigma which has been related to psychological distress and chronic anxiety, ultimately presenting a hinderance for medication adherence (Guimarães et al., 2008; Sherr et al., 2008). In yet another study, researchers found that social

support may in fact predict medication adherence but only when individuals have disclosed their status to others (Waddell & Messeri, 2006). It is evident that researchers have found difficulties establishing consistent connections between these constructs among HIV-positive populations as the researcher has encountered in the current investigation.

<div align="center">**Implications**</div>

The association between exposure to violence, impulsivity, and medication nonadherence has important implications for conceptualizing and administering treatment to individuals with HIV and AIDS. Furthermore, taking into consideration previous research and the factors examined in the current study, there are implications which must be considered for HIV and AIDS treatment, counselors working in healthcare settings, and for teaching and counselor education programs as our healthcare and treatment delivery system continue to move toward an environment that embraces streamlined interprofessional collaboration and integrative care.

Implications for HIV and AIDS Treatment

In their 2017 report on HIV drug resistance, the World Health Organization discusses the global target 90-90-90 which have been widely adopted. This target reflects the efforts of the global community to achieve the diagnosis of 90% of all people with HIV infections, providing treatment to 90% of the individuals who have been diagnosed, and guaranteeing that 90% of those receiving treatment reach virologic suppression by the year 2020. As of the end of 2016, those numbers were 70%, 77%, and 82%, respectively (World Health Organization, 2017). The World Health Organization has emphasized the importance of addressing HIV drug resistance and has guided 26 countries in implementing HIV drug resistance surveillance surveys. One of these countries is Mexico which has seen more than 10% pretreatment non-nucleoside reverse-transcriptase inhibitor (NNRTI) resistance in three of six surveys (World Health Organization,

2017). NNRTIs are considered first line of treatment of individuals with HIV, as such, drug resistance to these medications may come with a great cost including difficulty achieving viral suppression, increased chances of virologic failure or death, increased likelihood of discontinuing treatment, and increased probability of developing new HIV drug resistant mutations (World Health Organization, 2017). Suboptimal adherence to medication can increase the likelihood of developing drug resistant strains and virologic failure, also increasing the chances of transmitting a drug resistant strain to others (World Health Organization, 2017). Medication adherence in HIV and AIDS treatment is an urgent public health matter and must be addressed in clinics and treatment facilities worldwide.

Studies have focused on the causes of virologic failure and drug resistance from a medical standpoint but have also begun to increasingly identify psychological, social, and economic factors which influence adherence behaviors. Studies have been conducted in countries across the globe to help better understand these psychosocial factors influencing adherence and have identified similar trends among low- and middle- income countries. Substance use, cost of travel and access to transportation, adverse side-effects, lack of reminder tools, and perceived social acceptance have all been identified as factors influencing adherence (Shigdel, Klouman, Bhandari, & Ahmed, 2014). In addition to these aforementioned factors, others may include cost of medications, age, sex and gender, education, occupation, household composition, physical disabilities, self-esteem and motivation, mental health conditions, social status and social support, homelessness, incarceration, and cultural models of health and disease (Castro, 2005).

The clinic in Mexico has been at the forefront of treatment in the country and has included many items on their intake questionnaires addressing factors and behaviors such as those mentioned above: social support, mental health conditions, social support, living situation

and household composition, and occupation. The results of this study support the continued screening for factors associated with medication adherence and nonadherence in order to best understand the trends in specific populations as well as to best predict who will be more likely to not adhere for early interventions to take place. This will help to guide the fine-tuning of intake processes, evaluations, and assessments used to garner information from clients. This also supports the need for streamlined care with professionals from various backgrounds working collaboratively in order to create approaches that are holistic in nature and address the wholeness of an individual and their systems.

Implications for Counselors in Health Care Settings

Nonadherence to medications is associated with costs of over 1 billion dollars in the United States yearly with estimates of 33-69% of hospital stays attributed to poor adherence to medications (Palacio, Garay, Langer, Taylor, Wood, & Tamariz, 2016). This overwhelming statistic indicates a major problem in public health and signal a need for improved quality of care and intervention. Recently, there has been a trend toward integrating services in the delivery of healthcare. Integrative care has been increasingly recognized as essential to improving the quality of care to individuals seeking treatment (Shallcross, 2013). When considering the treatment of HIV and AIDS patients, counselors could play a crucial role in delivering treatment which is holistic and is targeted toward achieving best outcomes. Many of the factors influencing adherence to HIV medication are issues which counselors are trained to handle throughout their education. HIV and AIDS impacts many systems in the individual's life including social, psychological, and biological aspects. Counselors today are dealing with some of the most complex issues which face our society, making counselors prepared to deal with the array of complexities which HIV and AIDS patients face from the time of diagnosis (Quealy-Berge &

Caldwell, 2004). Counselors are well-versed in communication skills which are essential to the practice of healthcare in order to convey compassion and provide care in an ethical manner which focuses on the client-provider relationship. Research has shown that effective communication with emphasis on compassion and ethical practice leads to improved health outcomes, better quality of care, and increased patient and clinician satisfaction (Rider at al., 2014). This supports the need for counselors in integrated care since counselors are trained to form supportive and affirmative working alliances with their clients and are trained to provide empathic responses, show compassion, and be aware of biological, psychological, and social domains of a client's experiences (Bowen & Moore, 2014). The International Charter for Human Values in Healthcare have identified fundamental values essential to best practices including empathy, genuineness, acceptance, self-awareness, multicultural competence, attention to wellness, which are qualities identified as important characteristics for workers in the human services (International Charter for Human Values in Healthcare, 2011; Neukrug, 2017).

While counseling is a normal part of HIV testing, brief counseling interventions throughout the course of treatment are not currently a standard of treatment especially not with a focus on medication adherence. Several studies have been documented which provide information on the impact of counseling interventions on medication adherence in HIV-positive samples. One study piloted an adherence program consisting of one-on-one counseling which targeted patients starting ART for the first time. These patients were to attend two counseling sessions before initiating their ART regimen which focused on education on HIV and AIDS, resistance, and therapeutic failure, evaluation of family support, and identification of the barriers and strategies related to adherence (Winter, Halpern, Brozovich, & Neu, 2014). Researchers discovered that individuals who received the counseling intervention had improved rates of

adherence when compared to those who did not receive the counseling intervention. Adherence in this study was measured by appointment attendance; however, attendance was associated with an increase in CD4 counts which is often an indicator of adherence to ART. Another study examined brief medication adherence strategies implemented by pharmacists which emphasized the need for personalized adherence strategies based on the specific patient's lifestyle and the need for providing follow-up care for individuals who have been identified as nonadherent to their medications (Mangan, Fowers, & Lengel, 2012). Yet another study examined the effectiveness of motivational interviewing techniques on an HIV-positive sample in terms of adherence to ART. Motivational interviewing, a skill taught in most counseling programs, is an approach which utilizes cognitive behavioral techniques aiming to help individuals express and work through their ambivalence to address specific behaviors while encouraging clients to self-authorize and create solutions to their problems (Miller & Rollnick, 2012; Palacio et al., 2016). Researchers found that motivational interviewing interventions improved medication adherence although simultaneously acknowledged that improving adherence is difficult due to the complexity of its determinants and the inconsistent definitions of adherence existing in the literature. While research has supported the effectiveness of motivational interviewing in primary care and community clinics in the United States, there are inconsistent training methods and modes of delivery documented as well as duration of time exposed to motivational interviewing interventions and outcome measures (Palacio et al., 2016). This supports the need for further research in this area, establishment of best practices in terms of training and utilization of intervention programs targeting medication adherence so there is a standard of measurement across healthcare settings. Additionally, since counselors are skilled in motivational interviewing and are trained to work with client ambivalence, it could be a seamless opportunity for

counselors to play an integral role in achieving the target for optimal medication adherence among HIV and AIDS patients. This could involve counselors providing coaching and training to physicians and other medical staff or to be the leaders in developing and implementing counseling interventions with these aims in mind.

While counselors in healthcare are valuable assets to the treatment team, counselors may face certain challenges related specifically to their interactions with professionals from other disciplines. Interprofessional collaboration may present its challenges in healthcare settings yet remains a vital function especially in the treatment of HIV and AIDS which can be complex and involve many aspects of identity and impact the interlocking systems in which an individual's problems exist.

In the clinic in Mexico, there are several departments with a variety of healthcare professionals attempting to work together to facilitate streamlined holistic care of HIV and AIDS patients. Mental health professionals are part of this team. While the counselor identity is not yet well-established in Mexico as it is in the United States, the counseling profession continues to struggle in the United States to establish a professional identity which is cohesive (Mellin, Hunt, & Nichols, 2010). This lack of shared identity may exacerbate the challenges faced by counselors when faced with interprofessional collaboration since there are many overlapping characteristics with other helping professions. Despite these challenges, interprofessional work is increasingly supported as an optimal approach to healthcare service delivery requiring the expertise of professionals from multiple disciplines to address complex issues. Scholars including McAuliffe and Eriksen (1999) argue that counseling can be readily differentiated from other helping professions by its emphasis on development, prevention, and wellness, all necessary components of treatment in interprofessional settings.

When considering the role of counselors working with HIV and AIDS patients, there is a complex interplay of systems which are impacted in the individual's life guided by their diagnoses, symptoms, medication regimen, psychological processes, and resulting in issues with relationships, occupation, finances, etc. While counseling has traditionally been seen as a profession which focuses on the individual, this implicates the need for greater emphasis on systems theory in counseling programs and increased focus on ecological and contextual models highlighting the interplay of sociocultural forces (Arredondo, Shealy, Neale, & Winfrey, 2004). In interprofessional healthcare environments, counselors must adapt to dynamics of the workplace and the language and pace of physicians while also remaining confident in their knowledge and craft.

Implications for Counselor Education

Counselor education programs could benefit from implementing more coursework focused on integrative care which aims to increase knowledge of medications not only for psychiatric issues but also for HIV and other common ailments (Arredondo et al., 2004). Mellin et al. (2010) also suggest increased focus on positive psychology, solution-focused approaches, cognitive behavioral therapy, brief therapy, stress management, relaxation techniques, family systems work, motivational interviewing, strength-based approaches, and wellness-based approaches. In considering the immense impact of HIV and AIDS on the individual and the individual's systems and relationships, these aforementioned approaches would be optimal in the development of strategies targeting adherence counseling programs as well as in facilitating interprofessional collaboration. Offering students opportunities to hone these skills during their programs using hands-on experiences through mock simulations, practicums and internships, and

scholarship opportunities is not only ideal but vital as our society shifts toward new models of care.

Teaching. As treatment models continue to shift toward more holistic, integrative, and interprofessional approaches, counseling students would benefit from further training in ecological and systems theories in order to create a stronger thread throughout counseling programs which emphasizes collaborative efforts needed to achieve optimal service delivery. Since counselors are increasingly entering positions requiring them to work in healthcare settings and dealing with issues relating to chronic illnesses including HIV and AIDS, counselor educators might consider the development of specialized tracks within their counseling programs which not only emphasize systemic models but provide coursework aimed to prepare students for addressing health concerns, the mind-body connection, holistic and alternative forms of medical treatment, and integrative care. This may require a shift in the traditional views of counseling and counselor education.

Millen, Hunt, & Nichols (2011) conducted a qualitative study on counselor professional identity which revealed several stereotypes that exist within the counseling field regarding distinctions between the helping professions of social work, psychology, and counseling. The findings indicated that several of the participants believed that counseling was more focused on the individual at a microlevel, on wellness, and on personal growth rather than systemic issues, global issues of functioning, testing and assessment, and case management which were seen as more characteristic of social work and psychology. These views are problematic as counseling does require a systemic focus for many of the complex sociocultural issues clients will present during a session. Considering a complex issue such as HIV and AIDS, counselor educators have the responsibility for underlining the value of systems thinking and how these approaches can be

used to conceptualize work with individuals living with HIV and AIDS and other chronic illnesses including the manner in which the illnesses impact clients' worldviews and contextual experiences within various interlocking systems in their lives. Counselor educators have the responsibility to impart with counseling trainees the importance of counseling work in health care settings and to stress that counselors do belong alongside doctors, nurses, and social workers, for example. To effectively address integrative care models, counselor educators should include specific topics in their coursework and lesson plans including but not limited to the context of integrative mental health care, evaluating a client from an integrative perspective, recommending treatment and making referrals, and clinical problem solving (Lake, 2009). Having more practice with these concepts throughout the course of their education will better prepare students to understand the complexities of issues such as medication adherence and the importance of a systemic approach to dealing with the issue. Counselor educators can achieve this through the use of case vignettes, guest lecturers, and including options for integrative care practicum and internship experiences.

      Supervision. A predominant developmental model often used in clinical supervision is the Integrated Developmental Model (IDM) (Stoltenberg, McNeill, & Delworth, 1998). This model is based on the notion that supervisees go through phases, or levels, of development in their work. In each of these levels, the focus is on the motivation of the supervisee, the autonomy of the supervisee, and the awareness of the supervisee. Supervisors can use this practical model to assess the developmental level of the supervisee in order to accurately support, challenge, and promote growth with appropriate supervision interventions and strategies. A clear strength of this model is that it focuses on the developmental level of the supervisee. This helps the

supervisor to conceptualize the supervision process and relationship as well as to be sure to use the most appropriate techniques to facilitate professional growth and client welfare.

Using the IDM to conceptualize work with a supervisee who has clients living with HIV and AIDS is helpful in creating a framework for training counselors in integrative care settings. As counseling trainees embark on their practicum experience, it is essential for supervisors to share knowledge regarding systemic approaches to illness and coping and to work with the supervisee to encourage the understanding of how a diagnosis of HIV or AIDS can impact not only a person's health but also their worldview, social interactions, overall psychological wellbeing, and health behaviors such as medication adherence. Supervisees early on in their clinical experiences tend to be limited in their self-awareness and are unsure of their abilities in the therapeutic relationship. Supervisors can encourage supervisees to develop their sense of self-efficacy by arming the supervisee with information preparing them to assess for global issues of functioning and risk factors such as substance use which could be indicators of risky health behaviors, including nonadherence to medication.

As supervisees continue to gain confidence in their abilities, clinical work will continue to become more challenging as they gain new responsibilities. Supervisors should encourage supervisees to become more autonomous and assist them as they experience internal conflicts or resistance. These factors may be especially important for counselors working in interprofessional healthcare settings where they may experience difficulties working with professionals from other backgrounds such as medicine and social work. Supervisors are an integral part of a trainee's development and can support supervisees while challenging them for their growth. As trainees work with populations such as HIV-positive individuals who will challenge their knowledge of interlocking systems, supervisors have the responsibility to coach and educate yet also ensure

proper multicultural competencies and skills relating to evaluation and assessment regarding risk factors and monitoring of health behaviors impacting overall functioning.

Limitations

There are several limitations to this study which should be given consideration when interpreting the results of the current investigation. First, there are methodological concerns. Using logistic regression limits the outcome to using a categorical variable. Additionally, logistic regression tends to be vulnerable to overconfidence so the model could appear to have more predictive power than it actually does. The sample size utilized for the study was small for a logistic regression analysis. The sample size used was the minimum sample size needed to achieve power according to an a priori G*Power analysis. Furthermore, the sample was reduced significantly from its original size. The original data set included data from approximately 4,800 patients of the clinic which was reduced to a sample of 601 participants. This occurred due to the sampling process which was based on inclusion criteria. This was also due to excluding participants based on the assessments included as part of the intake evaluation at the clinic which had missing information that could not be imputed. After reducing the data set to 601, the distribution of cases among the two groups of the dependent variable medication adherence was significantly skewed. In order to account for this skewness, the researcher obtained two random samples from the adherent group which was larger and merged each of these samples with the nonadherent participants to form two separate subsets or samples. This strategy was used in attempts to best maintain the integrity of the sample, however, considering all aforementioned limitations, it is certainly a concern in that it may not capture the true essence of the population. A similar issue exists within the distribution of cases among the categorical independent variable

representing disclosure to family members of HIV-status. Cases were not evenly distributed among the four groups which may also present a limitation for the current analysis.

Regarding the independent variable representing exposure to violence, during the intake process, participants reported their experiences of abuse according to four different categories throughout the lifetime. This information was transformed into an ordinal variable which indicated how many types of these categories had been experienced throughout the lifetime instead of which specific types. This may be considered a limitation since there may be clear differences between groups in terms of their adherence behaviors. Additionally, information that was collected during the intake process regarding these experiences was intentionally excluded from the model but could have been relevant. This information pertained to stages of life during which the types of abuse or violence were experienced and could have added a richness to the study: childhood, adolescence, or adulthood.

Another limitation of the study was the use of an archival data set. The researcher attempted to immerse himself in the environment in which the data was collected to familiarize himself with the intake process, the data collection process, and the significance of the information being collected. However, the researcher had no control over the data collection process which could present potential limitations such as representation of targeted population, accuracy of information, and accuracy of clinical diagnoses. Many participants did not complete specific assessments which presented an issue for the researcher when conducting analyses resulting in a large number of cases excluded from the study.

Lastly, a limitation to be considered relates to the diagnoses of the participants. Participants included in the study represented a wide range of psychiatric diagnoses each with varying levels of representation. Additionally, participants with co-occurring substance abuse

issues were kept in the sample as long as they also had a primary diagnosis of a psychiatric disorder. This has the potential to have impacted the outcomes of the analyses. Causality can not be inferred due to the non-experimental nature of this study.

Implications for Future Research

Considering the results of this study and associated limitations, there are several implications for further research. First, future studies should optimize sample size in order to achieve a larger representation of the population. This will provide a stronger model through which to examine the relationships between the variables. Next, this study was a cross-sectional investigation using information from one point in time. In the future, repeated measures or longitudinal investigations may be beneficial to better understand the trends that exist within a specific population and will provide a more comprehensive understanding of the variables of focus. Additionally, the research may benefit from the examination of adverse childhood experiences and their impact on medication adherence to better understand if there is an association between the two. By continuing to improve models used on this population, best practices could be developed and implemented not only in the clinic in Mexico City, but could be tested in other clinics in the area, other clinics in the country, and outside of the country.

<div align="center">

Conclusion

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This study investigated the relationship between depression, stressors, disclosure to family members of HIV status, social support, impulsivity, and exposure to abuse on medication adherence. The purpose of this study was to add to the existing body of literature regarding the determinants of medication adherence to ART among HIV-positive individuals. Findings from this study suggest that both exposure to abuse and impulsivity may negatively impact medication adherence, however, findings were not consistent across the analyses in the study possible due to

sample size and uneven groups in several independent variables and the dependent variable. Future research can focus on improving the validity of the study by increasing the sample size and ensuring that groups are adequately distributed among the variables. This study emphasizes the importance of interprofessional collaboration, early prevention and detection of medication nonadherence, and the role of counselors in delivering services to address complex issues in healthcare, specifically HIV and AIDS.

CHAPTER 6

MANUSCRIPT

Abstract

This dissertation examined the relationships among disclosure, social support, exposure to violence, impulsivity, depression, stressors, and medication adherence, using a correlational design and a sequential logistic regression. The researcher used two samples of 146 from an archival data set of participants to create two subsets of the data (Data Set 1 & Data Set 2). These participants had been diagnosed with a mental illness and were prescribed a medication regimen for HIV treatment at the time of intake in a specialized clinic in Mexico City. Archival data was obtained through a demographic intake questionnaire and the use of valid and reliable instruments adapted for the specific population: State Impulsivity Scale (SIS) and the Beck Depression Inventory (BDI). Data analysis included descriptive statistics related to population demographics, bivariate correlations, and a sequential logistic regression based on existing literature on HIV/AIDS, medication adherence, and a theoretical model of stress and coping. Results of the analyses indicated that impulsivity was found to be predictive of medication nonadherence in Data Set 1 and exposure to violence was found to be predictive of medication nonadherence in Data Set 2. However, since both were not found to be significant across both subsets of the data, the variables could not be considered to robustly predict medication nonadherence in this study.

Introduction

Medication adherence is crucial for improving health outcomes in individuals with HIV and AIDS. However, research has shown that patients prescribed antiretroviral medications do not always adhere at optimal levels. Physicians treating HIV patients suggest 95%-100%

adherence to antiretroviral medication to hinder the replication of HIV in the bloodstream, strengthen immune functioning, lower likelihood of transmission, and decrease the chances of developing drug resistance (National Institutes of Health, 2017a; Smith, Rublein, Marcus, Brock, & Chesney, 2003). As the level of adherence decreases, the likelihood of virologic failure increases. Virologic failure and drug resistance can develop when adherence is not at optimal levels, increasing the chances that an individual could develop and transmit new drug-resistant strains of the virus in which HIV medications may no longer be effective. Adherence to medication is influenced by a variety of factors including the medication regimen itself, the patient-provider relationship, and psychosocial, behavioral, and structural barriers (National Institutes of Health, 2017). For this reason, continued research on the topic is vital to the understanding of the factors contributing to medication adherence in diverse populations to improve interventions, integrative care, and health outcomes.

For this study, the problem was examined in a population of HIV-positive individuals in Mexico City. While the prevalence of HIV and AIDS is lower in Mexico in comparison to other Latin American nations, there has been an increase in the amount of detected drug resistant strains of HIV in recent years signaling a significant concern for public health and medical professionals. The clinic from which the data are derived is one of the largest HIV-centered treatment facilities in Mexico and Latin America with a program targeting specialized treatment of HIV and AIDS patients who have been diagnosed with mental health disorders. Being that Mexico City is the largest metropolis in Latin America, it is an ideal setting to gain an understanding of the multitude of dynamics impacting HIV and AIDS treatment, specifically related to medication adherence. Typically thought of from a medical perspective, medication adherence is a topic most often discussed by physicians. While it is essential for physicians to be

involved in the screening of medication adherence, it is also essential for the involvement of other professionals, including counselors and related mental health specialists who may be more attuned to psychosocial and mental health factors impacting the lives of patients. As Western medicine continues to move toward an integrative care model, it is crucial to create effective treatment models in HIV/AIDS-specialized clinics and treatment centers to foster interprofessional collaboration, streamlined communication and treatment for optimized health outcomes.

The purpose of this study was to examine the relationships among psychosocial factors, immune functioning, and medication adherence in HIV-positive individuals. The archival data set which was analyzed in this dissertation has never been analyzed before, creating a unique opportunity to explore phenomena occurring in this population. The researcher intended to investigate these aforementioned relationships to cultivate new knowledge for the clinic in Mexico City and to contribute to ongoing research regarding medication adherence in public health. Additionally, it is the hope of both this researcher and the clinic staff that this research may highlight the need for further research on this topic, targeted efforts for improving medication adherence, enhanced screening for risk factors for nonadherence, and improved interventions for HIV patients using integrative care models where collaboration across the health professions is the norm. Based on prior literature, the following research questions guided this study:

1. What are the relationships between CD4 counts, violence, disclosure, and social support?

2. To what extent do disclosure, social support, impulsivity, and exposure to violence predict medication adherence in HIV-positive individuals after controlling for depression and major stressors experienced within the past year?

Literature Review

Psychiatric morbidity was detected early in the HIV epidemic. As such, HIV has long been associated with psychological distress including anxiety, depression, and other general negative mental health outcomes as it is a disease which significantly impacts all aspects of wellbeing (Folkman, 1993; Stewart et al., 2012; Choi et al., 2016). A study conducted in the United States in the 90s showed that 48% of adults receiving care for HIV showed signs of at least one psychiatric disorder on screenings within the previous year (Bing et al., 2001). This study included 2,864 who were administered a screening assessment for multiple psychiatric disorders including major depression, dysthymia, generalized anxiety disorder, and panic disorder. Researchers in the Netherlands studied the relationships between coping styles, goal disturbances, and psychological distress in HIV-positive individuals. In a sample of 43 participants from ages 23-63 who were at different stages of disease progression, the researchers found that disturbances of daily events, or goal disturbance, was directly related to higher levels of psychological distress. It was suggested from this study that these daily disturbances could result from HIV and associated symptoms as well as the medical regimen or associated side-effects (Van Der Veek, Kraaij, Kopeen, Garnefski, & Joekes, 2007). A more recent study conducted in 2013 used a community sample of 197 people living with HIV/AIDS to examine the impacts of societal stigma and internalized stigma on psychological wellbeing. Researchers concluded that stigma associated with HIV plays a central role in the development of depression and anxiety, especially in individuals who display pessimistic coping styles (Herek, Saha, & Burack, 2013). In 2014, a study conducted using a representative community sample in rural South Carolina assessed perceived stress, mood profile, and symptom-related distress to better understand the association between symptom distress and psychological factors among HIV-

positive persons. Participants were 18 years of age or older and were not taking medications to treat depression or anxiety at the time of the study. The results showed that the strongest correlations were between fatigue and symptom frequency and fatigue and symptom distress (Jaggers, Dudgeon, Burgess, Phillips, Blair, & Hand, 2014). These findings are important in their contribution to the literature since previous research has shown that fatigue is one of the most common symptoms reported by persons living with HIV/AIDS. Several studies in the early 2000s support these findings identifying strong correlations between fatigue and multiple measures of psychological distress and psychological distress, decrease in routine activities, and physical functioning due to fatigue (Norval, 2004; Phillips et al., 2004; Henderson, Safa, Easterbrook, & Hotopf, 2005; Hand, Phillips, & Dudgeon, 2006). Additionally, psychological distress has been detected in higher levels in persons living with HIV who report experiencing fatigue (Breitbart, McDonald, Rosenfeld, Monkman, & Passik, 1998). These combined results show that there is a long-known history of the correlation between psychiatric distress and HIV/AIDS diagnoses with strong support for the consequences of long-term distress leading to negative health behaviors and decreased quality of life.

Psychological stress, dejection, and distress are pervasive with chronic illness. Common sources of psychological distress in individuals with chronic illness are the ambiguity regarding one's future state of health, instability of symptoms or physical discomfort, and the impact on the individual's family and relationships (Holder-Perkins & Akman, 2006). Studies of individuals diagnosed with severe illness have labeled several key themes for preserving emotional stability including a search for meaning, attempts to gain control over illness, and attempts to enhance self-esteem (Holder-Perkins & Akman, 2006).

The immediate psychological impact following an HIV diagnosis is commonly one of acute distress manifested as depressed mood, anger, shock, anxiety, tension, perceived stress, and overwhelming intrusive thoughts. The prevalence of these symptoms has not yet been determined. While these symptoms are typically mild, they can be severe and even crippling to the degree that they may meet the criteria for a diagnosable psychiatric disorder (Holder-Perkins & Akman, 2006).

Depression and HIV

Depression constitutes the second most frequently observed illness worldwide. In the United States, depression is observed in about 6.7% of the population (National Institute of Mental Health, 2017). Among chronically ill persons in the United States, the rate of depression is higher at 9.5% with patients who suffer from HIV infection or AIDS experiencing a rate of depression which is significantly higher, ranging from 20-40% (U.S. Department of Veterans Affairs, 2018). Additionally, suicide ideation tends to be present among two thirds of patients who are depressed and the rate of suicide among depressed patients is 10-15% (Ruiz, 2006).

Several factors that put patients with HIV/AIDS at higher risk for depression are those with exposure to chronic stress, inadequate social support, and passive coping styles. Other factors which contribute to higher risk of developing depression are nondisclosure of HIV status, multiple losses, advanced illness, alcoholism, substance use, female gender, and personal or family history of suicide attempts, mood disorders, and anxiety disorders (Ruiz, 2006). The most common complications of chronic medical illness involve depressive symptoms. Studies have shown that depression has a damaging effect on patients' quality of life, adherence to treatment, and treatment outcomes (Treisman & Angelino, 2004). Despite compelling research, depressive conditions remain underrecognized, underdiagnosed, and undertreated in medical clinics,

especially in treatment centers focused on HIV/AIDS. Depression should be a major concern for

HIV/AIDS researchers and treatment providers as it can impact patient attitudes toward

treatment. Individuals with depression often care less about their own safety, act impulsively,

and have perpetual feelings of hopelessness (Treisman & Angelino, 2004).

Studies have shown an increased prevalence of HIV among individuals who have mental

health problems and an elevated prevalence of depression and other mental health conditions

across individuals who are HIV seropositive (Anderson & Weatherburn, 2004; Bing et al., 2001;

WHO, 2008). Researchers exploring the association between disease progression and depression

in both men and women found that individuals with HIV who exhibited depressive symptoms

were nearly 2 times more at risk of mortality than individuals who did not (Ickovics et al., 2001;

Mayne, Vittinghoff, Chesney, Barrett, & Coates, 1996). While an abundance of research has

established the connection between physical illness and depression, it has been challenging to

establish the causal pathway between the two. Depression can affect immune function; however,

it may also be the outcome of disease progression or negative life events (Pence et al., 2006).

Adherence and HIV

Adherence to medication can be defined as the extent to which a person's behavior

matches the health care regimen prescribed by a medical professional. Importantly, this treatment

regimen should be agreed upon by the healthcare professional and the patient. Adherence

involves taking medication correctly, at the right time, with the proper frequency, and at the

accurate dosage (Brown & Bussell, 2011; Cramer et al., 2008). Medication adherence is vital for

improving health outcomes with physicians emphasizing 80%-95% adherence for optimal

trajectory of health outcomes (Osterberg & Blaschke, 2005). However, physicians researching

and treating HIV patients suggest 95%-100% adherence to antiretroviral medication to impede

the replication of HIV in the bloodstream, strengthen immune functioning, lower likelihood of transmission, and decrease the chances of developing drug resistance (National Institutes of Health, 2017; Smith, Rublein, Marcus, Brock, & Chesney, 2003). While many HIV regimens currently include a combination of medications to effectively treat individuals, two main types of antiretroviral medications used are protease inhibitors and non-nucleoside reverse transcriptase inhibitors. Research has shown that in samples of HIV-positive individuals adhering 90% of the time to each of these classes of drugs, 55% of patients taking protease inhibitors and less than 10% taking non-nucleoside reverse transcriptase inhibitors experienced virologic failure (Paterson et al., 2000; Viswanathan, et al., 2016). As the level of adherence decreases, the likelihood of virologic failure will increase. Virologic failure is defined as a level of greater than 400 copies/mL of HIV in the bloodstream than the last clinic visit. Virologic failure and drug resistance can develop when adherence is not at optimal levels, increasing the chances that an individual could develop and transmit new drug-resistant strains of the virus in which HIV medications may no longer be effective (National Institutes of Health, 2017b). Factors to consider which may impact adherence in an individual are side effects, high cost of treatment, lack of access to treatment, poor communication between provider and patient, unstable living situation, alcohol or drug use, fear of disclosure, and illness or depression (National Institutes of Health, 2017b; Cutler & Everrett, 2010; Simpson, 2006). In research conducted examining correlations between race and medication adherence, researchers found that Hispanics and African Americans have lower medication adherence rates in comparison with Caucasians (Manias & Williams, 2010; Simpson, 2006).

Depression, Adherence, and HIV

Depression and psychological distress have been well-documented in research as contributing factors to negative health outcomes and poor adherence to medical treatments (DiMatteo et al., 2000; Manning & Wells, K. B., 1992). Grenard et al. (2011) conducted a meta-analysis of 31 studies including over 18,000 participants to explore the relationship between depression and medication adherence in the treatment of chronic illnesses in the United States. Depressed patients were found to be 1.76 times more likely to be nonadherent to treatment regimens than their non-depressed counterparts. In a review of the literature regarding Latino HIV-positive men who have sex with men (MSM), increased levels of depression were associated with increased frequency of high-risk sexual behaviors, implicating increased risk for transmission of HIV, especially if those individuals were nonadherent (Gonzales, Hendriksen, Collins, Durán, & Safren, 2009). In the United States, where Latinos are less likely to seek help and receive proper treatment for mental illness, including depression, the risk for nonadherence is increased (Gonzales, Hendriksen, Collins, Durán, & Safren, 2009). Numerous studies focusing on HIV-positive men and adherence behaviors have supported the relationship between depression and nonadherence to treatment underscoring the importance for effective and informed clinical practice, preventive measures, and intervention (Blashill, Perry, & Safren, 2011; Gonzalez et al., 2004).

In Mexico, researchers have found depression to be prevalent among persons living with HIV at similar rates to studies conducted in the United States (Caballero-Suarez, Rodriguez-Estrada, Candela-Iglesias, and Reyes-Teran, 2017). In northern Mexico, a study was conducted with 64 participants where researchers examined the relationships between stress levels, depression, and adherence to medication regimen. The results of the study showed that high levels of stress and depression tend to occur simultaneously and contribute to poor adherence to

medical treatment (Piña Lopez, Dávila Tapia, Sánchez-Sosa, Togawa, & Cázares Robles, 2008). This has strong implications for assessment, early intervention and treatment, and maintenance for HIV/AIDS patients as poor adherence to antiretroviral medication may result in proliferation of HIV in the body as well as drug resistance. Pérez-Salgado, Compean-Dardón, & Ortiz-Hernández (2016), obtained a sample of persons living with HIV from various clinics in Mexico to study the relationship between food insecurity and adherence to HIV medications. From the sample in Mexico City, it was noted that psychological distress best explained the relationship between food insecurity and medication adherence. While food insecurity is associated with poor mental health and poor adherence to treatment, it is also important to note that poor mental health status has generally been associated with nonadherence. That is to say, deficient psychological distress is another potential mechanism by which food insecurity would be associated with nonadherence to medication.

Social Support and Disclosure of HIV-positive Status

Social support has long been explored as a key component in health outcomes for individuals with chronic illness. For individuals with HIV/AIDS, disclosure of one's status is a unique process complexly connected to social support and influenced by factors such as race, society, perception of stigma, family, children, sex partners, and mental health (Rotzinger et al., 2016). Chaudoir, Fisher, & Simoni (2011) reviewed literature on disclosure and its relationship to social support, collaborating to establish a model which addresses the gaps in research on this topic. Their Disclosure Processes Model aims to provide a framework to conceptualize the process of disclosure for people living with HIV/AIDS. These researchers emphasize that previously developed models have focused on the identification of factors leading to disclosure such as disease progression, perceived consequences, and levels of relationship intimacy (Bairan

et al., 2007; Serovich, 2001; Serovich, Lim, & Mason, 2008) rather than the outcomes of disclosure. The creators of the newer processes model argue that disclosure has implications for both individual health and public health by having positive influences on overall health and health behaviors. For example, individuals living with HIV/AIDS might attain greater social support after disclosure encouraging openness about status and a change in behaviors and perceptions impacting one's health (Kalichman, DiMarco, Austin, Luke, & Difonzo, 2003). Individuals may disclose their HIV-positive status to strengthen their relationships and to gain social support from others, however, individuals may also avoid disclosure of their positive status due to fear conflict and social rejection (Chaudoir, Fisher, & Simoni, 2011). Disclosure has the potential to impact health outcomes as it can result in more social support, the mitigation of negative psychological effects of suppression, and overall improved psychological wellbeing (Strachan, Bennett, Russo, & Roy-Byrne, 2007). In a study conducted by Hays, McKusick, Pollack, & Hilliard (1993), researchers found that HIV-positive MSM who disclosed their status to their supports reported lower depression at a one-year follow-up. Strachan et al., (2007) conducted a longitudinal study in which they found increased improved immune functioning predicted by disclosure of HIV status among a group of HIV-positive men and women in the United States. This research was supported by previous research conducted by Sherman, Bonanno, Wiener, & Battles (2000) which found increases in immune functioning among children who disclosed their HIV status to at least one friend after a one-year follow-up in comparison to children who had not disclosed their HIV-positive status. However, research regarding disclosure and social support have been contradictory and inconsistent, especially in regards to adherence to antiretroviral medications for HIV. According to the Disclosure Processes Model, adherence to HIV medications can be facilitated by disclosure in that

disclosure provides access to social support and allows for individuals to take their medication publicly, or at the very least in front of their supports to whom they have disclosed. Other research has shown the opposite, specifically that disclosure has no association with adherence or may actually lead to nonadherence. People living with HIV/AIDS often experience stigma surrounding their diagnosis which may lead to psychological distress and chronic anxiety, ultimately hindering adherence to antiretroviral medications (Guimarães et al., 2008; Sherr et al., 2008). Waddell & Messeri (2006) found that while social support may in fact predict medication adherence, social support only seems to matter when individuals have disclosed. Researchers have had difficulty establishing the connections between social support, disclosure, and medication adherence due to these inconsistencies but also due to the complex relationships existing between these mechanisms and the probability that these relationships are mediated by other psychological factors (Huynh, Kinsler, Cunningham, & Sayles, 2013; Waddell & Messeri, 2006).

In a cross-sectional study conducted in Mexico, 172 participants living with HIV/AIDS were involved in a study examining antiretroviral adherence behaviors and the relationship to psychological and social variables (Ybarra Sagarduy, Piña Lopez, González Ramírez, & Fierros Dávila, 2017). Among these 172 participants, 141 were 100% adherent to their treatment regimens. The researchers used several measures including the Psychological Variables and Adherence Behaviors Questionnaire (VPAD-24), the Stress-Related Situations Scale (SVE-12), the Zung Depression Scale, and the Duke-UNC Functional Social Support Questionnaire, three of which were adapted and validated in Mexico. Using structural equation modeling, the researchers found a relationship between personality and medication adherence behaviors. However, despite low levels of depression and high levels of perceived social support reported

among participants, no significance was determined in any of the structural models in this study

(Ybarra Sagarduy, Piña Lopez, González Ramírez, & Fierros Dávila, 2017). The positive

behaviors associated with personality, however, were found to have a direct, significant effect on

immune functioning and viral load.

Interpersonal Violence

Interpersonal violence is a broad term which includes child abuse, intimate partner

violence, hate crimes, and sexual assault and rape by a partner or non-partner. Interpersonal

violence has strong implications for health outcomes and health-related behaviors (Blashill et al.,

2011). Interpersonal violence has been associated with increased mental health issues including

PTSD and depression, chronic pain, and increased utilization of healthcare resources. Several

studies have been conducted to explore the links between medication adherence in exposure to

interpersonal violence. In a study conducted by Ramachandran, Yonas, Silvestre, and Burke

(2010), 73% of individuals in a sample of 56 diagnosed with HIV infection reported a history of

interpersonal violence, specifically intimate partner violence. Researchers found higher levels of

medication nonadherence among the 73% with exposure to violence during their lifetime. In

another study conducted in 2010, researchers investigated the impact of intimate partner violence

on adherence to antiretroviral medication. Researchers obtained a sample of 190 participants

who were prescribed a medication regimen for HIV (Lopez, Jones, Villar-Loubet, Arheart, &

Weiss, 2010). It was found that a history of experiencing intimate partner violence was a

significant predictor of medication nonadherence for women but not men. Researchers found a

significant relationship, however, between negative coping strategies and poor adherence

behaviors among men. In a study where researchers tested a path model for nonadherence,

researchers found that interpersonal violence was correlated with poor medication adherence in

addition to poor quality of life and increased viral load among a sample of 178 HIV-positive men (Pantalone, Hessler, & Simoni, 2010). Other recent research which has focused on the occurrence of intimate partner violence experienced by women has suggested that intimate partner violence and interpersonal violence may lead to higher viral load and increased risky-behavior, including medication nonadherence (Rose, House, Stepleman, 2010; Trimble, Nava, & McFarlane, 2013). Important to note is that viral load could be an indicator of nonadherence to medication or even virologic failure.

In a study conducted in Southern California, data was collected from 914 Latina participants relating to history of abuse (Newcomb, Locke, & Goodyear, 2003). Researchers explored variables such as family abuse, sexual abuse, and family neglect and their relationship with outcomes such as HIV-attitudes and HIV-related behaviors. Using structural equation modeling, the researchers concluded that childhood experiences of abuse do play a role in predicting HIV-related risk among other negative effects such as psychosocial functioning. A large study based on the Behavioral Risk Surveillance System Survey (Kessler et al., 2010) involved assessing for experiences of sexual, psychological, and physical abuse in 48,526 adults from five U.S. states (Campbell, Walker, Leonard, & Egede, 2016). Multiple logistic regression models were used to find relationships between experiences of abuse during childhood and health outcomes. Researchers found that sexual abuse and verbal abuse predicted risky HIV behavior and depression. This information is important and relevant especially since childhood abuse and violence are especially prevalent among ethnic minorities, including Latino/as. In studies conducted among Latino MSM, it has been found consistently that rates of childhood abuse seem to be higher when compared to non-Latino MSM (Balsam, Lehavot, Beadnell, & Circo, 2010; Feldman & Meyer, 2007).

Impulsivity

Psychiatric disorders and symptoms are more prevalent in people living with HIV/AIDS and individuals with a diagnosable psychiatric disorder are more likely to be nonadherent to their medication regimen (Bing et al., 2001; Gonzalez, Batchelder, Psaros, & Safren, 2011), Additionally, impulsivity and depression have been reported in association with poor adherence to medication among HIV-positive individuals. In a study conducted with 103 participants, 56% of whom were diagnosed with mood disorders, researchers found that the participants who scored high on measures assessing sensation-seeking behaviors and impulsivity were less likely to adhere to their medication (Liraud & Verdoux, 2001). This effect was found after controlling for history of substance abuse. In a study conducted in Mexico City among HIV-positive patients, levels of impulsivity and depression were measured among 1,350 patients, 89% male, using the State Impulsivity Scale (Iribarren et al., 2011) and the BDI (Beck, Steer, & Brown, 1996). Levels of impulsivity were highest among patients who were depressed, suggesting greater risk for poor adherence and risky sexual behaviors among depressed patients (Vega-Ramirez, et al., 2015).

Importance of Current Study

Medication adherence is vital for HIV/AIDS patients. However, research has shown that adherence continues to be an issue among individuals living with various chronic illnesses. In the United States, it is estimated that more than 25% of patients with chronic conditions are nonadherent to their prescribed medication regimens with an annual cost of nonadherence estimated to be near $290 billion US dollars (Taitel, Jiang, Ewing, & Duncan, 2012). While HIV medication has improved and become more accessible in many parts of the world, rigorous adherence to the medication remains an essential part of treatment for improved health outcomes,

and avoidance of virologic failure and drug resistance. Psychological and social factors have been well-documented in research as contributing factors to negative health outcomes and poor adherence to HIV medication in the United States and Mexico. According to the U.S. Department of Health and Human Services (2016), several factors contributing to nonadherence are side effects of medication, busy schedule and travel, unstable living conditions, illness or depression, substance use, fear of disclosing HIV status, or lack of health insurance or finances to cover the cost of medication. This knowledge supports the need for early intervention strategies and early screening for risk factors which could contribute to medication nonadherence. Due to the variability found in the literature regarding adherence, there are existing implications for repeated studies and testing within new groups of individuals across cultures and the need for integrative care and collaboration among medical professionals and mental health professionals. By streamlining care to include better communication and collaboration among mental health professionals and physicians, there is greater potential for improved patient outcomes, holistic care, and improved intervention strategies (Winfield, Sparkman-Key, & Vajda, 2017). A retrospective cohort study conducted in the Midwest of the United States, evaluated a program which was designed to improve adherence to medication among new patients receiving statin therapy. The program involved face-to-face counseling sessions with pharmacists who utilized motivational interviewing techniques to assist patients with their medication adherence. Adherence was measured using a medication possession ratio and was based on the benchmark of 80% adherence which is commonly used in medication adherence research. Researchers found that patients who participated in the counseling program exhibited greater adherence to their medication regimen than patients who were part of the comparison group and received usual care. This study not only highlights the effectiveness of

brief counseling interventions to improve medication adherence but shows the potential for the involvement of counseling professionals who could participate in the training and coaching of medical staff in motivational interviewing, empathic responding, and screening for various psychological risk factors for medication nonadherence.

Research Design

The article will utilize a nonexperimental, cross-sectional research design. This data is cross-sectional since the data was recorded from a specific group at a single point in time (Thompson & Panacek, 2007). Cross-sectional research provides a naturalistic view of the investigated phenomena due to lack of researcher influence which often exists in experimental research in which variables are intentionally manipulated (Field, 2017). The majority of the data in this study was self-report collected via intake questionnaire and a battery of self-report assessments. Clinical mental health and medical professionals provided additional information on the intake forms in regard to mental health diagnoses, mental health issues identified as barriers to treatment, and CD4 counts and viral load as determined by laboratory blood tests.

This study investigates psychosocial phenomena that are measurable and objective, therefore supporting the use of quantitative linear methods to test the research questions (Bernard, 2013). Previous research on HIV-positive individuals focusing on adherence have used a variety of research designs and analyses to study factors influencing medication adherence and nonadherence among people living with HIV/AIDS. Studies reported in the literature utilized bivariate and multivariate logistic regression models, however, lacked sequential analyses to control for the influence of pre-existing psychological variables (e.g. Chandwani et al., 2012; Rotzinger et al., 2016; Weaver, Pane, Wandra, & Windiyaningsih, & Samaan, 2014). Most recently, in a study conducted in a northern state of Mexico, researchers used structural equation

modeling to examine psychological influences on antiretroviral medication adherence in a population of Mexican people living with HIV/AIDS. This study included variables such as decision-making, tolerance of ambiguity, tolerance of frustration, motivates to behave, depression, and social support (Sagarduy et al, 2017). In this model, social support and depression were found to be nonsignificant in relationship with medication adherence, unlike other analyses mentioned in the literature where depression and social support were found to be significant (Grenard et al., 2011; Gonzalez et al., 2009). In the field of HIV/AIDS research, contradictory literature is the norm, requiring specific models to be tested within new populations in differing geographic regions, cultures, and ethnic groups. The current data set has never been analyzed and will contribute to the body of literature on people living with HIV/AIDS. To better understand the relevance of psychosocial factors in the role of medication adherence in the population of HIV-positive individuals in Mexico City, a regression analysis was most helpful since regression analyses assist in studying the relationships between several predictor variables and an explicit outcome (Heppner, Wampold, & Kivlighan, 2008). For this study, a sequential logistic regression analysis was utilized in which the researcher specified the order of entry of the predictor variables based on a theoretical rationale (Petrocelli, 2003; Tabachnick & Fidell, 2014). Since contradictory findings present themselves in the literature, a sequential logistic regression controlled for pre-existing psychosocial variables (e.g. depression and major stressors experienced within the past year) based on the theoretical framework presented in Chapter Two to provide knowledge of the extent to which disclosure, exposure to violence, social support, and impulsivity impact medication adherence in this population. The researcher entered the pre-existing psychosocial variables first to control for the effects of these variables to understand the effects of disclosure, social support, impulsivity and violence beyond

that accounted for by depression and other major stressors. This allowed the researcher to perform a more rigorous analysis of the relationship between the variables of interest and medication adherence.

Included in the model for the current study are 6 predictor variables: disclosure (categorical), social support (continuous), exposure to violence (continuous), stressors (continuous), impulsivity (continuous), and depression (continuous). The outcome variable is a binary categorical variable, medication adherence to antiretroviral medication for HIV treatment. All participants in the sample have been diagnosed with depression by a clinician but may have varying BDI scores. Additionally, patients recorded the number of major stressors experienced within the past year. As such, depression scores and stressors will be included within the first block of the sequential regression model to control for the effects of these variables. Disclosure, social support, exposure to violence, and impulsivity will be included in the second block of the sequential regression model. This model was utilized to analyze two subsets of the data which were subsequently created after the initial data screening in order to account for uneven groups in the dependent variable. Additionally, bivariate correlations were conducted to determine relationships between CD4 counts, social support, and exposure to violence and a one-way ANOVA was conducted to determine if significant mean differences existed between disclosure groups.

Data Collection

Data was collected by mental health clinicians from 2010-2016 at a large specialized clinic in Mexico City. In this clinic, mental health clinicians work and function as part of a separate mental health department with their own set of protocol and work flow procedures. Most typically, patients arrive to the clinic to receive free HIV testing from the medical team.

Once a patient has been diagnosed with HIV, the patient is sent for laboratory blood tests to obtain viral load and CD4 counts. The patient is also referred to the mental health program for a psychological evaluation, a brief intervention, and a treatment plan. The psychological evaluation consists of a comprehensive intake form and a battery of 6 assessments. The intake form and 2 of the 6 assessments are part of the current study and will be explained in more detail in the section regarding instrumentation. Other patients referred to the mental health program for evaluation are transgender-identified individuals who are both HIV-positive and HIV-negative, and HIV-positive individuals who have been diagnosed elsewhere prior to presenting to the specialized clinic. In the current data set, the researcher used a subset of individuals all diagnosed with HIV.

Participants

  Sampling Criteria. The researcher used a convenience sample of individuals from the full data set based on specific criteria. Convenience sampling in health research is advantageous as it helps the researcher to gather useful information from a specific set of participants accessible to the researcher which may have not been possible using other sampling techniques, such as probability sampling (Tyrer & Heyman, 2016). Additionally, the purpose of this study was not generalizability, but investigation of a specific population in a particular geographic region, of which this sample is representative. Inclusion criteria for this study was a diagnosis of HIV or AIDS, current prescribed antiretroviral medication regimen, sexually transmitted HIV, and a clinician diagnosis of depression. This resulted in a total of 601 participants to be included from the original data set which included data of 4,842 patients. In the data set containing 601 participants, the two groups of the dependent variable were uneven so two random samples were taken from the larger group ("adherent") and assigned to two smaller subsets including the full

nonadherent group to create two subsets of 146. This number was determined through a power

analysis discussed in the next section.

Power Analysis. Power represents the ability to correctly reject a null hypothesis. It is a

function of the magnitude of the effect, the probability level chosen for statistical significance,

and the sample size used in the study (Keith, 2015). The researcher used G*Power 3.1 to

determine the minimum sample size necessary to yield significant results in a sequential logistic

regression analysis. For an analysis with a medium effect size (f^2) of .15, error probability (α) of

.05, power (β) of .95, and six predictor variables, the power analysis indicated an optimal sample

size of 146. According to Cohen (1988, 1992), researchers should achieve a minimum power of

.80. The statistical power of the current study indicates that there is a 95% chance of detecting an

effect if it exists.

Participant Demographics. All participants were patients at a specialized clinic in the

center of Mexico City residing in one of Mexico City's 16 boroughs or in close proximity to the

city limits. Of the 146 participants included in Data Set 1 of this study, 122 identified as male, 20

identified as female, and 2 identified as transgender female. Age ranged from 17-67. For marital

status, 110 participants were single, 33 were married or partnered, and 3 were widowed.

Regarding occupation, 44 of the participants were unemployed at the time of their intake. In

terms of religion, 72 of participants identified as Catholic. Regarding sexual orientation, 101 of

participants identified as homosexual, 12 as bisexual, and 30 as heterosexual. Lastly, 98 of

participants had a detectable viral load at the time of their intake and 44 had an undetectable viral

load.

Of the 146 participants included in Data Set 1 of this study, 130 identified as male, 15

identified as female, and 1 identified as transgender female. Age ranged from 17-64. For marital

status, 115 participants were single, 29 were married or partnered, and 2 were widowed.

Regarding occupation, 38 of the participants were unemployed at the time of their intake. In

terms of religion, 72 of participants identified as Catholic. Regarding sexual orientation, 104 of

participants identified as homosexual, 16 as bisexual, and 26 as heterosexual. Lastly, 93 of

participants had a detectable viral load at the time of their intake and 50 had an undetectable viral

load.

Recoding

Violence, stressors, and disclosure responses were gathered via intake questionnaire

checklists. For example, participants were asked whether they had experience psychological,

emotional, physical, or economic abuse during the course of their lifetime. This variable was

recoded as an ordinal variable ranging from 0-4 where 0 indicated no exposure to violence, and 4

indicated exposure to each of the types of violence listed in the questionnaire. Stressors

experienced during the past year was included as a checklist of 7 different stressors on the intake

evaluation which was coded as an ordinal variable in the data set where 0 indicated no exposure

to major stressors and 7 indicated exposure to all stressors listed in the questionnaire. Two

variables in the data set corresponded to disclosure to family of HIV or AIDS status. These

variables were transformed to create a new variable which was coded as 0 for no disclosure to

family of HIV status, 1 for disclosure to family with reaction of support, 2 for disclosure to

family with reaction of rejection, and 3 for disclosure to family with reaction of indifference.

BDI and EIE scores were aggregated to form sum variables for each of the scales. BDI, EIE, and

social support variables did not need further coding or transformation as they are continuous

scale variables.

Data Analysis

For the first research question, a correlational analysis was conducted in order to examine the relationships between the continuous variables social support, violence, and CD4 counts. Next, an ANOVA was conducted to estimate the mean differences in CD4 counts among disclosure groups. Prior to running correlational analyses, data was screened to determine if a linear relationship existed between the variables. Data was also screened for normality. The researcher used SPSS to construct scatterplots and boxplots and to compute normality tests. The violence, social support, and CD4 variables were determined not to be normally distributed according to the Shapiro-Wilk's test ($p < .05$). Due to non-normality of the data and monotonicity as observed in the produced scatterplots, a Spearman correlation was conducted on the three variables.

Using SPSS, Spearman correlations were utilized to determine if a relationship existed among violence, social support, and CD4 counts. Specifically, the researcher aimed to identify relationships between violence and CD4 counts and social support and CD4 counts. In Data Set 1, the analysis showed a significant small positive correlation between violence and CD4 counts ($r_s = .189, p < .05$). In Data Set 2, neither violence nor social support were found to have statistically significant relationships with CD4 counts.

Table 1. Correlation Coefficients (Spearman Correlation) of Violence, Social Support, and CD4 Variables for Data Set 1.

	Violence	Social Support	CD4
Violence	-		
Social Support	-.212*	-	
CD4	.189*	.055	-

Table 2. Correlation Coefficients (Spearman Correlation) of Violence, Social Support, and CD4 Variables for Data Set 2.

	Violence	Social Support	CD4
Violence	-		
Social Support	-.272*	-	
CD4	.112	.036	-

Prior to running the ANOVA to determine mean differences across disclosure groups, assumptions were checked. Assumptions of a one-way ANOVA are a continuous dependent variable, a categorical independent variable with two or more independent groups, independence of observations, no significant outliers in the groups of the independent variable in terms of the dependent variable, a normally distributed dependent variable for each group of the independent variable, and a dependent variable with a normal distribution. SPSS was utilized to construct boxplots for each disclosure group and determined that there were no significant outliers among each of the groups. A Shapiro-Wilk's test determined that two groups (No Disclosure and Acceptance from Family) were not normally distributed ($p < .05$) and the groups corresponding to individuals who were rejected by family and whose families were indifferent to their disclosure were approximately normally distributed ($p > .05$). A one-way ANOVA was conducted to determine estimates of mean differences between disclosure groups on their CD4 counts. The analysis determined that there were no statistically significant mean differences in CD4 counts between the groups.

Research Question Two: To what extent do disclosure, social support, impulsivity, and exposure to violence predict medication adherence in HIV-positive individuals after controlling for depression and major stressors experienced within the past year?

For research question two, a logistic regression model was utilized to estimate the contribution of each predictor variable while simultaneously taking other predictor variables into account and was tested across two groups, each composed of the smaller nonadherent group and a random sample of the adherent group due to the unbalanced levels in the outcome variable. This strategy was utilized in order to assess the generalizability of the model (Chan, 2004; Katz, 1999). The analyses were conducted in two steps into which BDI scores and stressors were entered first followed by psychosocial variables of interest to identify the influence of depression and stress before taking other possible risk factors for medication nonadherence into account.

The researcher conducted two two-step binary logistic regression analyses to determine if the addition of disclosure of HIV status to family members, exposure to violence, social support, and impulsivity improved the prediction of medication adherence over depression and stressors experienced over the past year. The dependent variable for the analyses was medication adherence, self-reported during an intake questionnaire. Stressors experienced in the past year and depression scores as measured by the BDI were entered into the first block of the model as control variables. Disclosure of HIV status to family members, impulsivity as measured by the EIE, exposure to violence, and social support were entered into the second step of the model. See Table for details on the full regression model. With regard to the full model, variables that were statistically significant for both Data Set 1 and Data Set 2 are considered to robustly predict the medication adherence outcomes (Cohen, Cohen, West, & Aiken, 2003).

Logistic regression analyses were computed separately for each random sample of the adherent group that was taken and will be referred to Data Set 1 and Data Set 2, respectively. The omnibus test for Step 1 of the analyses yielded a nonsignificant Hosmer and Lemeshow test for Data Set 1 $\square^2(8) = 11.775$, $p > .05$, and Data Set 2 $\square^2(8) = 5.098$, $p > .05$. This indicates that

the overall model fit of the psychosocial predictor variables was statistically reliable in predicting medication adherence at the time of intake. The Negelkerke R^2 for Step 1 variables was .154 for Data Set 1 and for Data Set 2 was .120, indicating small effect sizes for the associations between the selected psychosocial variables and medication adherence. In these analyses, depression as measured by the BDI scores was a significant predictor of medication adherence in both groups. The value of Exp(B) indicated that the odds of nonadherence to HIV medication increased 8.9% for every 1 point increase in BDI scores in Data Set 1 [Exp(B) = 1.089, 95% CI =1.040-1.140] and by 8.6% in Data Set 2 [Exp(B) = 1.086, 95% CI = 1.036-1.140].

In Step 2, selected psychosocial variables were entered into the regression analyses for the two groups. The results of the Hosmer and Lemeshow test indicated that the overall model fit of the six variables was statistically reliable in distinguishing between adherence or nonadherence to ART at the time of intake evaluation in both Data Set 1 $\Box^2(8) = 6.345$, $p = .609$, and Data Set 2 $\Box^2(8) = 13.870$, p = .085. The Nagelkerke R^2 for Data Set 1 was .240 and for Data Set 2 was .197, indicating that the full model explained 24% and 19% of the variation in the outcome variable of Data Set 1 and Data Set 2, respectively. The inclusion of the psychosocial variables in Step 2 resulted in an increase of 4.8% and 2.8%, respectively, in variance accounted in the prediction of medication adherence beyond the variance accounted by Step 1 variables only. The overall accuracy of the model to predict participants to be nonadherent at the time of intake evaluation was 69.2% in Data Set 1 and 65.8% in Data Set 2. In Data Set 1, the model correctly classified 82.1% of participants who were adherent and 54.4% of participants who were nonadherent. In Data Set 2, the model correctly classified 74.4% of participants who were adherent and 55.9% of participants who were nonadherent. In these analyses, none of the

psychosocial factor variables were found to be a significant predictor of medication adherence in both groups. However, impulsivity scores as measured by the EIE were found to be significantly and positively related to medication nonadherence in Data Set 1 and exposure to violence was found to be significantly and positively related to medication nonadherence in Data Set 2. For complete statistics of binary logistic regression analyses for both groups, see Table 11 and 12.

Table 11. Binary Logistic Regression Coefficients of Data Set 1.

	B	*SE*	Wald	*df*	Sig.	Exp(*B*)
Stressors	.071	.189	.142	1	.706	1.074
BDI	.038	.031	1.536	1	.215	1.039
EIE	.052	.026	3.973	1	.046	1.053
Disclosure No Disclosure (Reference)			4.700	3	.195	
Support	.056	.462	.015	1	.904	1.058
Rejection	-1.105	.795	1.930	1	.165	.331
Indifference	.681	.588	1.341	1	.247	1.975
Violence	.266	.175	2.305	1	.129	1.305
Social Support	-.041	.062	.439	1	.508	.960
Constant	-1.316	.485	7.348	1	.007	.268

Table 12. Binary Logistic Regression Coefficients of Data Set 2.

	B	*SE*	Wald	*df*	Sig.	Exp(*B*)
Stressors	.011	.156	.005	1	.946	1.011

BDI	.035	.035	1.004	1	.316	1.036
EIE	.044	.028	2.416	1	.120	1.045
Disclosure No Disclosure (Reference)			3.321	3	.345	
Support	.681	.455	2.237	1	.135	1.975
Rejection	-.469	.864	.294	1	.588	.626
Indifference	.323	.517	.390	1	.532	1.381
Violence	.358	.176	4.118	1	.042	1.431
Social Support	.001	.063	.000	1	.985	1.001
Constant	-1.768	.518	11.653	1	.001	.171

Discussion

The aim of this study was to investigate the relationship between impulsivity, social support, disclosure of HIV-positive status to family members, exposure to violence and medication adherence. The purpose of this study was to add to the existing body of literature regarding medication adherence among HIV-positive patients while highlighting psychosocial factors which have the potential to impact adherence behaviors. Further, this study controlled for depression and life stressors which have found to be predictive of adherence behaviors and poor health behaviors in previous studies. The researcher hopes to support the mission of the Clínica Especializada Condesa to establish streamlined care and best practices for the treatment of their patients and to also support the need for counselor interventions in mental health programs targeting the treatment of HIV-positive individuals.

The researcher conducted this study using an archival data set comprised of data collected by researchers and medical staff at the Clínica Especializada Condesa of Mexico City.

The final data set used for this dissertation included 601 participants from which two subsets were created, each containing 146 participants. Ages of participants ranged from 17-67 years. Participants completed intake questionnaires including questions regarding experiences of violence throughout the lifetime, disclosure of HIV status to family members, social support, life stressors experienced over the past year, and various other demographics including age, sexual orientation, gender, borough of residence, employment status, and household information. Participants also completed assessments regarding impulsivity, depression, substance use, and physical and mental health functioning. Medical professionals recorded information derived from laboratory blood samples such as CD4 counts and viral loads. Mental health professionals recorded mental health diagnoses based on their clinical judgement using the DSM. The researcher conducted bivariate correlations, a one-way ANOVA, and two hierarchical logistic regressions to address the research questions.

Major Findings

The results of this study contribute to the extensive body of literature already in existence in the field of HIV and AIDS medication adherence research. The findings include varying levels of support for the research questions and hypotheses.

Research Question One

Bivariate correlations were conducted to investigate the relationships between CD4 cell counts and social support and exposure to violence. Results varied in the relationships between Data Set 1 and Data Set 2. In Data Set 1, the correlations showed a significant positive correlation between violence and CD4 counts, indicating that as violence increased, CD4 counts increased. The relationship between social support and CD4 was not statistically significant. In Data Set 2, the analysis resulted in no statistically significant correlations between neither social

support and CD4 nor violence and CD4. Therefore, researchers failed to reject the null hypotheses for this analysis. The hypotheses predicted a positive relationship between CD4 counts and social support and negative relationship between CD4 counts and exposure to violence.

A one-way ANOVA was conducted to examine the differences in CD4 counts between disclosure groups (no disclosure, family accepted, family rejected, family indifferent). In both Data Set 1 and Data Set 2, there were no significant differences between the four disclosure groups indicating a failure to reject the null hypothesis.

Research Question Two

A sequential logistic regression was conducted to examine the relationship between exposure to violence, impulsivity, social support, disclosure to family and medication adherence when controlling for depression scores and stressors experienced within the past year. In support of the research question, the model tested in both Groups One and Two were found to be significant overall. While there were no factors which were found to be significant predictors of medication adherence in both groups, impulsivity was found to be a significant predictor of medication nonadherence in Data Set 1 and exposure to violence was found to be a significant predictor of medication nonadherence in Data Set 2. Because neither variable was found to robustly predict medication adherence (resulting in significance in both data sets), the researcher failed to reject the null hypothesis for this research question. While the model controlled for stressors and depression, stressors were not found to a be a significant predictor of medication nonadherence in either group while depression was statistically significant in each group. While neither impulsivity nor exposure to violence were significant across both groups, this

information is noteworthy in the consideration of this population and in their treatment as medication adherence has significant implications for HIV-positive patients.

Supportive Findings

This research suggests that both increased exposure to violence and higher scores on a scale measuring impulsivity are predictive of increased probability of nonadherence to ART. Medication adherence is vital for improving health outcomes with physicians emphasizing 80-95% adherence for optimal health outcomes. However, physicians treating and researching HIV, specifically, suggest 95-100% adherence to ART in order to prevent replication of HIV in the bloodstream, to strengthen the functioning of the immune system, to lower the likelihood of transmission, and to decrease the odds of developing drug resistant strains (National Institutes of Health, 2017a; Osterberg & Blaschke, 2005; Smith et al., 2003).

Previous research has supported the association between violence and nonadherence to medication among HIV-positive individuals. While the probability of medication nonadherence significantly increased in only one of the subsets in this study, interpersonal violence has been associated with increased mental health issues including PTSD and depression and has also been associated with medication nonadherence in several studies found in the literature (Blashill et al., 2011). The current study included participants who had experienced physical, psychological, and emotional abuse. This is consistent with studies that have found higher levels of nonadherence to ART among individuals who have experienced intimate partner violence, interpersonal violence, sexual abuse, and verbal abuse (Campbell et al., 2016; Lopez et al, 2010; Pantalone et al., 2010; Ramachandran et al., 2010). Important to mention is also the relationship between ethnic groups and experiences of violence throughout the lifetime. While the sample in the study was an international sample comprised entirely of Mexican nationals, in the United States it has been

found that rates of childhood abuse seem to be higher in Latino MSM when compared to non-Latino MSM. This information is relevant especially since child abuse and violence are prevalent among ethnic minorities, including Latino/as (Balsam et al., 2010; Feldman & Meyer, 2017). This finding is important since research supports a connection between early childhood traumas and risky-behaviors later in life.

Contradictory Findings

As was found during a review of the literature documented in Chapter Two of this dissertation, literature regarding the study of medication adherence in HIV-positive populations contains contradictory findings. This study did not find any significant results in the relationships between medication adherence, social support, and disclosure of HIV status to family members. Although there were no significant findings in this study, it is important to not dismiss these factors. Non-significant findings could be due to the limitations discussed later in this section or due to nuances of the specific population targeted for this investigation.

Social support has long been explored as a component in health outcomes for individuals with chronic illness. For individuals with HIV and AIDS, social support and disclosure to family and loved ones may be complexly interrelated. Individuals may disclose their HIV-positive status to strengthen their relationships and to gain support from others but may also avoid doing so due to fear of conflict and rejection (Chaudoir et al., 2011). Several studies have shown the connection between disclosure of HIV status, decreased symptoms of depression, and improved immune functioning (Hays et al., 1993; Sherman et al., 2000; Strachan et al., 2007). Yet disclosure of HIV-positive status may increase stigma which has been related to psychological distress and chronic anxiety, ultimately presenting a hinderance for medication adherence (Guimarães et al., 2008; Sherr et al., 2008). In yet another study, researchers found that social

support may in fact predict medication adherence but only when individuals have disclosed their status to others (Waddell & Messeri, 2006). It is evident that researchers have found difficulties establishing consistent connections between these constructs among HIV-positive populations as the researcher has encountered in the current investigation.

<div align="center">**Implications**</div>

The association between exposure to violence, impulsivity, and medication nonadherence has important implications for conceptualizing and administering treatment to individuals with HIV and AIDS. Furthermore, taking into consideration previous research and the factors examined in the current study, there are implications which must be considered for HIV and AIDS treatment, counselors working in healthcare settings, and for teaching and counselor education programs as our healthcare and treatment delivery system continue to move toward an environment that embraces streamlined interprofessional collaboration and integrative care.

Implications for HIV and AIDS Treatment

In their 2017 report on HIV drug resistance, the World Health Organization discusses the global target 90-90-90 which have been widely adopted. This target reflects the efforts of the global community to achieve the diagnosis of 90% of all people with HIV infections, providing treatment to 90% of the individuals who have been diagnosed, and guaranteeing that 90% of those receiving treatment reach virologic suppression by the year 2020. As of the end of 2016, those numbers were 70%, 77%, and 82%, respectively (World Health Organization, 2017). The World Health Organization has emphasized the importance of addressing HIV drug resistance and has guided 26 countries in implementing HIV drug resistance surveillance surveys. One of these countries is Mexico which has seen more than 10% pretreatment non-nucleoside reverse-transcriptase inhibitor (NNRTI) resistance in three of six surveys (World Health Organization,

2017). NNRTIs are considered first line of treatment of individuals with HIV, as such, drug resistance to these medications may come with a great cost including difficulty achieving viral suppression, increased chances of virologic failure or death, increased likelihood of discontinuing treatment, and increased probability of developing new HIV drug resistant mutations (World Health Organization, 2017). Suboptimal adherence to medication can increase the likelihood of developing drug resistant strains and virologic failure, also increasing the chances of transmitting a drug resistant strain to others (World Health Organization, 2017). Medication adherence in HIV and AIDS treatment is an urgent public health matter and must be addressed in clinics and treatment facilities worldwide.

Studies have focused on the causes of virologic failure and drug resistance from a medical standpoint but have also begun to increasingly identify psychological, social, and economic factors which influence adherence behaviors. Studies have been conducted in countries across the globe to help better understand these psychosocial factors influencing adherence and have identified similar trends among low- and middle- income countries. Substance use, cost of travel and access to transportation, adverse side-effects, lack of reminder tools, and perceived social acceptance have all been identified as factors influencing adherence (Shigdel, Klouman, Bhandari, & Ahmed, 2014). In addition to these aforementioned factors, others may include cost of medications, age, sex and gender, education, occupation, household composition, physical disabilities, self-esteem and motivation, mental health conditions, social status and social support, homelessness, incarceration, and cultural models of health and disease (Castro, 2005).

The clinic in Mexico has been at the forefront of treatment in the country and has included many items on their intake questionnaires addressing factors and behaviors such as those mentioned above: social support, mental health conditions, social support, living situation

and household composition, and occupation. The results of this study support the continued screening for factors associated with medication adherence and nonadherence in order to best understand the trends in specific populations as well as to best predict who will be more likely to not adhere for early interventions to take place. This will help to guide the fine-tuning of intake processes, evaluations, and assessments used to garner information from clients. This also supports the need for streamlined care with professionals from various backgrounds working collaboratively in order to create approaches that are holistic in nature and address the wholeness of an individual and their systems.

Implications for Counselors in Health Care Settings

Nonadherence to medications is associated with costs of over 1 billion dollars in the United States yearly with estimates of 33-69% of hospital stays attributed to poor adherence to medications (Palacio, Garay, Langer, Taylor, Wood, & Tamariz, 2016). This overwhelming statistic indicates a major problem in public health and signal a need for improved quality of care and intervention. Recently, there has been a trend toward integrating services in the delivery of healthcare. Integrative care has been increasingly recognized as essential to improving the quality of care to individuals seeking treatment (Shallcross, 2013). When considering the treatment of HIV and AIDS patients, counselors could play a crucial role in delivering treatment which is holistic and is targeted toward achieving best outcomes. Many of the factors influencing adherence to HIV medication are issues which counselors are trained to handle throughout their education. HIV and AIDS impacts many systems in the individual's life including social, psychological, and biological aspects. Counselors today are dealing with some of the most complex issues which face our society, making counselors prepared to deal with the array of complexities which HIV and AIDS patients face from the time of diagnosis (Quealy-Berge &

Caldwell, 2004). Counselors are well-versed in communication skills which are essential to the

practice of healthcare in order to convey compassion and provide care in an ethical manner

which focuses on the client-provider relationship. Research has shown that effective

communication with emphasis on compassion and ethical practice leads to improved health

outcomes, better quality of care, and increased patient and clinician satisfaction (Rider at al.,

2014). This supports the need for counselors in integrated care since counselors are trained to

form supportive and affirmative working alliances with their clients and are trained to provide

empathic responses, show compassion, and be aware of biological, psychological, and social

domains of a client's experiences (Bowen & Moore, 2014). The International Charter for Human

Values in Healthcare have identified fundamental values essential to best practices including

empathy, genuineness, acceptance, self-awareness, multicultural competence, attention to

wellness, which are qualities identified as important characteristics for workers in the human

services (International Charter for Human Values in Healthcare, 2011; Neukrug, 2017).

While counseling is a normal part of HIV testing, brief counseling interventions

throughout the course of treatment are not currently a standard of treatment especially not with a

focus on medication adherence. Several studies have been documented which provide

information on the impact of counseling interventions on medication adherence in HIV-positive

samples. One study piloted an adherence program consisting of one-on-one counseling which

targeted patients starting ART for the first time. These patients were to attend two counseling

sessions before initiating their ART regimen which focused on education on HIV and AIDS,

resistance, and therapeutic failure, evaluation of family support, and identification of the barriers

and strategies related to adherence (Winter, Halpern, Brozovich, & Neu, 2014). Researchers

discovered that individuals who received the counseling intervention had improved rates of

adherence when compared to those who did not receive the counseling intervention. Adherence in this study was measured by appointment attendance; however, attendance was associated with an increase in CD4 counts which is often an indicator of adherence to ART. Another study examined brief medication adherence strategies implemented by pharmacists which emphasized the need for personalized adherence strategies based on the specific patient's lifestyle and the need for providing follow-up care for individuals who have been identified as nonadherent to their medications (Mangan, Fowers, & Lengel, 2012). Yet another study examined the effectiveness of motivational interviewing techniques on an HIV-positive sample in terms of adherence to ART. Motivational interviewing, a skill taught in most counseling programs, is an approach which utilizes cognitive behavioral techniques aiming to help individuals express and work through their ambivalence to address specific behaviors while encouraging clients to self-authorize and create solutions to their problems (Miller & Rollnick, 2012; Palacio et al., 2016). Researchers found that motivational interviewing interventions improved medication adherence although simultaneously acknowledged that improving adherence is difficult due to the complexity of its determinants and the inconsistent definitions of adherence existing in the literature. While research has supported the effectiveness of motivational interviewing in primary care and community clinics in the United States, there are inconsistent training methods and modes of delivery documented as well as duration of time exposed to motivational interviewing interventions and outcome measures (Palacio et al., 2016). This supports the need for further research in this area, establishment of best practices in terms of training and utilization of intervention programs targeting medication adherence so there is a standard of measurement across healthcare settings. Additionally, since counselors are skilled in motivational interviewing and are trained to work with client ambivalence, it could be a seamless opportunity for

counselors to play an integral role in achieving the target for optimal medication adherence among HIV and AIDS patients. This could involve counselors providing coaching and training to physicians and other medical staff or to be the leaders in developing and implementing counseling interventions with these aims in mind.

While counselors in healthcare are valuable assets to the treatment team, counselors may face certain challenges related specifically to their interactions with professionals from other disciplines. Interprofessional collaboration may present its challenges in healthcare settings yet remains a vital function especially in the treatment of HIV and AIDS which can be complex and involve many aspects of identity and impact the interlocking systems in which an individual's problems exist.

In the clinic in Mexico, there are several departments with a variety of healthcare professionals attempting to work together to facilitate streamlined holistic care of HIV and AIDS patients. Mental health professionals are part of this team. While the counselor identity is not yet well-established in Mexico as it is in the United States, the counseling profession continues to struggle in the United States to establish a professional identity which is cohesive (Mellin, Hunt, & Nichols, 2010). This lack of shared identity may exacerbate the challenges faced by counselors when faced with interprofessional collaboration since there are many overlapping characteristics with other helping professions. Despite these challenges, interprofessional work is increasingly supported as an optimal approach to healthcare service delivery requiring the expertise of professionals from multiple disciplines to address complex issues. Scholars including McAuliffe and Eriksen (1999) argue that counseling can be readily differentiated from other helping professions by its emphasis on development, prevention, and wellness, all necessary components of treatment in interprofessional settings.

When considering the role of counselors working with HIV and AIDS patients, there is a complex interplay of systems which are impacted in the individual's life guided by their diagnoses, symptoms, medication regimen, psychological processes, and resulting in issues with relationships, occupation, finances, etc. While counseling has traditionally been seen as a profession which focuses on the individual, this implicates the need for greater emphasis on systems theory in counseling programs and increased focus on ecological and contextual models highlighting the interplay of sociocultural forces (Arredondo, Shealy, Neale, & Winfrey, 2004). In interprofessional healthcare environments, counselors must adapt to dynamics of the workplace and the language and pace of physicians while also remaining confident in their knowledge and craft.

Implications for Counselor Education

Counselor education programs could benefit from implementing more coursework focused on integrative care which aims to increase knowledge of medications not only for psychiatric issues but also for HIV and other common ailments (Arredondo et al., 2004). Mellin et al. (2010) also suggest increased focus on positive psychology, solution-focused approaches, cognitive behavioral therapy, brief therapy, stress management, relaxation techniques, family systems work, motivational interviewing, strength-based approaches, and wellness-based approaches. In considering the immense impact of HIV and AIDS on the individual and the individual's systems and relationships, these aforementioned approaches would be optimal in the development of strategies targeting adherence counseling programs as well as in facilitating interprofessional collaboration. Offering students opportunities to hone these skills during their programs using hands-on experiences through mock simulations, practicums and internships, and

scholarship opportunities is not only ideal but vital as our society shifts toward new models of care.

Teaching. As treatment models continue to shift toward more holistic, integrative, and interprofessional approaches, counseling students would benefit from further training in ecological and systems theories in order to create a stronger thread throughout counseling programs which emphasizes collaborative efforts needed to achieve optimal service delivery. Since counselors are increasingly entering positions requiring them to work in healthcare settings and dealing with issues relating to chronic illnesses including HIV and AIDS, counselor educators might consider the development of specialized tracks within their counseling programs which not only emphasize systemic models but provide coursework aimed to prepare students for addressing health concerns, the mind-body connection, holistic and alternative forms of medical treatment, and integrative care. This may require a shift in the traditional views of counseling and counselor education.

Millen, Hunt, & Nichols (2011) conducted a qualitative study on counselor professional identity which revealed several stereotypes that exist within the counseling field regarding distinctions between the helping professions of social work, psychology, and counseling. The findings indicated that several of the participants believed that counseling was more focused on the individual at a microlevel, on wellness, and on personal growth rather than systemic issues, global issues of functioning, testing and assessment, and case management which were seen as more characteristic of social work and psychology. These views are problematic as counseling does require a systemic focus for many of the complex sociocultural issues clients will present during a session. Considering a complex issue such as HIV and AIDS, counselor educators have the responsibility for underlining the value of systems thinking and how these approaches can be

used to conceptualize work with individuals living with HIV and AIDS and other chronic illnesses including the manner in which the illnesses impact clients' worldviews and contextual experiences within various interlocking systems in their lives. Counselor educators have the responsibility to impart with counseling trainees the importance of counseling work in health care settings and to stress that counselors do belong alongside doctors, nurses, and social workers, for example. To effectively address integrative care models, counselor educators should include specific topics in their coursework and lesson plans including but not limited to the context of integrative mental health care, evaluating a client from an integrative perspective, recommending treatment and making referrals, and clinical problem solving (Lake, 2009). Having more practice with these concepts throughout the course of their education will better prepare students to understand the complexities of issues such as medication adherence and the importance of a systemic approach to dealing with the issue. Counselor educators can achieve this through the use of case vignettes, guest lecturers, and including options for integrative care practicum and internship experiences.

Supervision. A predominant developmental model often used in clinical supervision is the Integrated Developmental Model (IDM) (Stoltenberg, McNeill, & Delworth, 1998). This model is based on the notion that supervisees go through phases, or levels, of development in their work. In each of these levels, the focus is on the motivation of the supervisee, the autonomy of the supervisee, and the awareness of the supervisee. Supervisors can use this practical model to assess the developmental level of the supervisee in order to accurately support, challenge, and promote growth with appropriate supervision interventions and strategies. A clear strength of this model is that it focuses on the developmental level of the supervisee. This helps the

supervisor to conceptualize the supervision process and relationship as well as to be sure to use the most appropriate techniques to facilitate professional growth and client welfare.

Using the IDM to conceptualize work with a supervisee who has clients living with HIV and AIDS is helpful in creating a framework for training counselors in integrative care settings. As counseling trainees embark on their practicum experience, it is essential for supervisors to share knowledge regarding systemic approaches to illness and coping and to work with the supervisee to encourage the understanding of how a diagnosis of HIV or AIDS can impact not only a person's health but also their worldview, social interactions, overall psychological wellbeing, and health behaviors such as medication adherence. Supervisees early on in their clinical experiences tend to be limited in their self-awareness and are unsure of their abilities in the therapeutic relationship. Supervisors can encourage supervisees to develop their sense of self-efficacy by arming the supervisee with information preparing them to assess for global issues of functioning and risk factors such as substance use which could be indicators of risky health behaviors, including nonadherence to medication.

As supervisees continue to gain confidence in their abilities, clinical work will continue to become more challenging as they gain new responsibilities. Supervisors should encourage supervisees to become more autonomous and assist them as they experience internal conflicts or resistance. These factors may be especially important for counselors working in interprofessional healthcare settings where they may experience difficulties working with professionals from other backgrounds such as medicine and social work. Supervisors are an integral part of a trainee's development and can support supervisees while challenging them for their growth. As trainees work with populations such as HIV-positive individuals who will challenge their knowledge of interlocking systems, supervisors have the responsibility to coach and educate yet also ensure

proper multicultural competencies and skills relating to evaluation and assessment regarding risk factors and monitoring of health behaviors impacting overall functioning.

Limitations

There are several limitations to this study which should be given consideration when interpreting the results of the current investigation. First, there are methodological concerns. Using logistic regression limits the outcome to using a categorical variable. Additionally, logistic regression tends to be vulnerable to overconfidence so the model could appear to have more predictive power than it actually does. The sample size utilized for the study was small for a logistic regression analysis. The sample size used was the minimum sample size needed to achieve power according to an a priori G*Power analysis. Furthermore, the sample was reduced significantly from its original size. The original data set included data from approximately 4,800 patients of the clinic which was reduced to a sample of 601 participants. This occurred due to the sampling process which was based on inclusion criteria. This was also due to excluding participants based on the assessments included as part of the intake evaluation at the clinic which had missing information that could not be imputed. After reducing the data set to 601, the distribution of cases among the two groups of the dependent variable medication adherence was significantly skewed. In order to account for this skewness, the researcher obtained two random samples from the adherent group which was larger and merged each of these samples with the nonadherent participants to form two separate subsets or samples. This strategy was used in attempts to best maintain the integrity of the sample, however, considering all aforementioned limitations, it is certainly a concern in that it may not capture the true essence of the population. A similar issue exists within the distribution of cases among the categorical independent variable

representing disclosure to family members of HIV-status. Cases were not evenly distributed among the four groups which may also present a limitation for the current analysis.

Regarding the independent variable representing exposure to violence, during the intake process, participants reported their experiences of abuse according to four different categories throughout the lifetime. This information was transformed into an ordinal variable which indicated how many types of these categories had been experienced throughout the lifetime instead of which specific types. This may be considered a limitation since there may be clear differences between groups in terms of their adherence behaviors. Additionally, information that was collected during the intake process regarding these experiences was intentionally excluded from the model but could have been relevant. This information pertained to stages of life during which the types of abuse or violence were experienced and could have added a richness to the study: childhood, adolescence, or adulthood.

Another limitation of the study was the use of an archival data set. The researcher attempted to immerse himself in the environment in which the data was collected to familiarize himself with the intake process, the data collection process, and the significance of the information being collected. However, the researcher had no control over the data collection process which could present potential limitations such as representation of targeted population, accuracy of information, and accuracy of clinical diagnoses. Many participants did not complete specific assessments which presented an issue for the researcher when conducting analyses resulting in a large number of cases excluded from the study.

Lastly, a limitation to be considered relates to the diagnoses of the participants. Participants included in the study represented a wide range of psychiatric diagnoses each with varying levels of representation. Additionally, participants with co-occurring substance abuse

issues were kept in the sample as long as they also had a primary diagnosis of a psychiatric disorder. This has the potential to have impacted the outcomes of the analyses. Causality can not be inferred due to the non-experimental nature of this study.

Implications for Future Research

Considering the results of this study and associated limitations, there are several implications for further research. First, future studies should optimize sample size in order to achieve a larger representation of the population. This will provide a stronger model through which to examine the relationships between the variables. Next, this study was a cross-sectional investigation using information from one point in time. In the future, repeated measures or longitudinal investigations may be beneficial to better understand the trends that exist within a specific population and will provide a more comprehensive understanding of the variables of focus. Additionally, the research may benefit from the examination of adverse childhood experiences and their impact on medication adherence to better understand if there is an association between the two. By continuing to improve models used on this population, best practices could be developed and implemented not only in the clinic in Mexico City, but could be tested in other clinics in the area, other clinics in the country, and outside of the country.

<div align="center">

Conclusion

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This study investigated the relationship between depression, stressors, disclosure to family members of HIV status, social support, impulsivity, and exposure to abuse on medication adherence. The purpose of this study was to add to the existing body of literature regarding the determinants of medication adherence to ART among HIV-positive individuals. Findings from this study suggest that both exposure to abuse and impulsivity may negatively impact medication adherence, however, findings were not consistent across the analyses in the study possible due to

sample size and uneven groups in several independent variables and the dependent variable. Future research can focus on improving the validity of the study by increasing the sample size and ensuring that groups are adequately distributed among the variables. This study emphasizes the importance of interprofessional collaboration, early prevention and detection of medication nonadherence, and the role of counselors in delivering services to address complex issues in healthcare, specifically HIV and AIDS.

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OLD DOMINION UNIVERSITY

OFFICE OF THE VICE PRESIDENT FOR RESEARCH

DATE: March 12, 2018

TO: Kaprea Johnson, PhD
FROM: Old Dominion University Education Human Subjects Review Committee

PROJECT TITLE: [1200446-1] Psychosocial Determinants of Medication Adherence
                among HIV-positive Individuals in Mexico City
REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: March 12, 2018

REVIEW CATEGORY: Exemption category # *6.4*

Thank you for your submission of New Project materials for this project. The Old Dominion University Education Human Subjects Review Committee has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact Jill Stefaniak at (757) 683-6696 or jstefani@odu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Old Dominion University Education Human Subjects Review Committee's records.

ANTHONY J. VAJDA
Old Dominion University
4301 Hampton Blvd, Suite 2100
Norfolk, VA 23529

EDUCATION

Old Dominion University
Norfolk, VA
PhD, Counselor Education and Supervision   May 2018

La Salle University
Philadelphia, PA
Master of Arts in Clinical-Counseling Psychology   May 2014

University of Delaware
Newark, DE
Bachelor of Arts in Psychology   May 2011

SELECT PUBLICATIONS

Peer-Reviewed Publications

Winfield, C., Sparkman-Key, N., & **Vajda, A**. (2017). Professional standards: Embracing preventive ethics in human services. *Journal of Human Services, 37*(1), 55-62.

Winfield, C., Sparkman-Key, N., & **Vajda, A.** (2017). Interprofessional collaboration among helping professions: Experiences with holistic client care. *Journal of Interprofessional Education & Practice, 9*, 66-73. doi: 10.1016/j,xjep.2017.08.004

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SELECT PRESENTATIONS

Belcher, T., Lund, S., & **Vajda, A.** (2017, October). *Forging a path to empathy in a divided America: Teaching multicultural counseling.* Association for Counselor Education and Supervision National Conference, Chicago, IL.

Vajda, A., Fernandes, S., & Belcher, T. (2017, July). *Counseling Implications for working with undocumented Latino youth*. American Mental Health Counselors Association National Conference, Washington, D.C.

Vajda, A., & Gerwe, C. (2016, October). *Queer discourses: Experiences of gay Latinos in the mainstream*. Southern Association for Counselor Education and Supervision, New Orleans, LA.