

Academic Research

Depression, Substance Abuse and Antiretroviral Non-adherence Among Adults with HIV in Care at the Clínica de Familia in La Romana, Dominican Republic

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Background: People living with HIV/AIDS (PLWHA) are more likely to experience a psychiatric disorder in their lifetime when compared to the general population. This can greatly affect adherence to the centerpiece of HIV treatment, antiretroviral therapy (ART), and the course that the illness can take. Depression and substance use are the two most common psychiatric disorders in PLWHA. This cross-sectional study examined rates of depression, substance use, adherence to ART and HIV biomarkers on a sample of HIV-positive patients serviced by a general medical clinic, Clínica de Familia La Romana (CFLR) in the Dominican Republic (DR).

Methods: A cross-sectional, questionnaire-based study was conducted in a clinic with a special program for PLWHA in La Romana, DR, over four weeks in Fall 2015. The questionnaire included demographic information and scales for assessing adherence, depression and substance use: the Morisky Medication Adherence Scale (MMAS-4), Patient Health Questionnaire-2 and -9 (PHQ-2 and -9) and CAGE-AID, respectively. Open-ended, exploratory questions on the experience of living with HIV/AIDS were posed to every fourth or fifth participant. Additionally, two important biomarkers for measuring HIV progression and severity, CD4 cell counts and HIV-RNA viral loads (most recent value within the last six months), were extracted from the medical chart. Data analysis was carried out using the Statistical Package of Social Sciences (SPSS) software.

Results: 89 participants were involved in the study. The mean age was 40.0 years old (SD 10.9) with an almost equal distribution of women and men; two participants self-identified as transgender. 80 participants (89.9%) scored positively on the PHQ-2, which means they met at least one of the two major criteria for depression: loss of interest in activities and depressed mood. The mean PHQ-9 for those who scored positive on the PHQ-2 was 10.6 (SD 4.7; threshold of 10 for major depression). Those with good ART adherence had a mean PHQ-9 of 9.4 (SD 5.0) while the mean for those with poor ART adherence was 11.2 (SD: 4.4). 27 participants (30.3%) fit criterion for severe alcohol or drug use (> 2). Participants endorsing drug use in their lifetime used marijuana (n=8) and cocaine (n=5). Based on the MMAS-4, 41.3% of those on ART had good adherence (score=0), whereas 58.7% had poor adherence (score > 1). Dominican origin and the completion of at least primary school were associated with good adherence (p-value = 0.04 and p-value = 0.03, respectively). Being female was associated with increased PHQ-9 scores (p-value = 0.01) as well as undetectable viral loads (p-value = 0.03); being male was associated with increased alcohol or drug use (p-value < 0.01). In the exploratory questions, most individuals reported acquiring HIV from a spouse or known romantic partner and reported being diagnosed after personally falling ill or witnessing their partner do so. Major concerns were inability to find work, loneliness and fear of discrimination.

Conclusions: Depressive symptoms and substance use were common factors that impacted ART adherence in a sample of PLWHA treated at Clínica de Familia La Romana in the Dominican Republic. Using validated measures to implement screening for depression and substance use could help identify those requiring diagnosis and appropriate care within the constraints of this low-resource clinic.

Introduction

Considerable evidence suggests that the majority of HIV-infected individuals will experience a diagnosable psychiatric disorder in their lifetimes at five times the rate of the general population.^{1,2} Depression and substance abuse are the most common mental disorders in people living with HIV/AIDS (PLWHA).^{3,4,5,6} Individuals with HIV

are twice as likely to be diagnosed with depression compared to HIV-negative individuals, and a third of all depressed patients have a co-occurring substance use disorder.^{7,8} One possible explanation for this link is that these disorders share common biological and psychosocial origins, and that depression leads to self-medication with alcohol and other drugs.¹

Untreated depression and substance use disorders in PLWHA are associated with increased sexual risk behaviors, decreased immune response, a more rapid HIV disease progression due to ART non-adherence and thus possible ART drug resistance.⁹ Multiple risk factors for nonadherence exist in this population, including lack of energy or motivation, feelings of hopelessness and social isolation or changes in cognition.¹⁰ These facts render the treatment of depression and substance use in PLWHA of utmost importance.¹ Indeed, it has been shown that successfully treating psychiatric comorbidities benefits HIV-treatment retention, antiretroviral therapy (ART) adherence, HIV-RNA viral suppression and ultimately community viral load (a population-based measure of HIV-infected individuals' concentration of HIV-1 RNA).^{11,12,13}

The causes of depression in PLWHA are likely multifactorial and involve social, psychological and biological factors.¹ Some psychosocial risk factors for depression in PLWHA include being of female gender, previous history of depression, comorbid psychiatric issues (i.e. substance abuse, psychosis), HIV-related physical symptoms, psychosocial impairment, avoidance behavior, unemployment and financial distress.¹ Additionally many risk factors for HIV (i.e. those presented to men who have sex with men (MSM), sex workers and other vulnerable populations) make an individual subject to discrimination and other stressors that can contribute to depression even prior to an HIV diagnosis.¹ Possible biological risk factors for depression in PLWHA include the neurotropic characteristics of the virus (i.e. invasion of the central nervous system and subsequent brain disease) as well as potential inflammatory processes due to HIV.¹⁴ HIV infects important cells in the central nervous system (CNS) that can contribute to cognitive impairment, a predisposing factor for depression. Similarly, the chronic nature of HIV promotes continued inflammation that over time destroys the tISSUE II in the CNS and throughout the body.

PLWHA with depression initiate ART later in the infection compared to those without depressive disorders (i.e. those with depression initiate ART on lower CD4 cell counts, a marker of immune-compromise, and higher HIV-RNA viral loads).¹⁵ They also adhere poorly to ART once initiated.¹⁶ Pooled data from one meta-analysis found that the likelihood of achieving good ART adherence among those with depressive symptoms was 42% lower than those without, regardless of the country's income and study design.¹⁷ Even at subclinical levels, symptoms of depression have been linked to poor ART adherence and worse HIV-related outcomes.^{16,18} A systematic review found that seven out of nine studies evaluating the impact of antidepressant treatment on ART adherence found improvement in adherence when treating depression with antidepressants.¹⁹

Substance use is often comorbid with depression and presents its own complications. A substance-abusing individual is also more likely to engage in risk-taking behavior under the influence of drugs or alcohol, which may contribute to new HIV infections and overall community viral load.²⁰ In PLWHA, regardless of co-infection with hepatitis B or C, heavy drinking predicts end-stage disease and mortality.²¹ Some studies suggest that this stems from compromised ART adherence under the influence of substances, while others have found that the increase in morbidity and mortality associated with heavy drinking in PLWHA is independent of adherence.²²

Diagnosing and treating substance abuse in PLWHA may have multiple benefits beyond addressing substance use: improving depression, promoting consistent ART adherence and consequently potentially achieving HIV viral suppression.^{23,24} Furthermore, treating substance use may help prevent additional risk taking behavior and decrease the number of new cases of HIV.

In summary, strict adherence to ART is critical for HIV treatment success. It promotes sustained HIV suppression, reduced risk of drug resistance and improved overall health, quality of life and survival. Strict ART adherence also decreases community viral load by reducing the risk of HIV transmission between individuals.²⁵ To achieve viral suppression, an HIV-infected individual must be aware of their diagnosis, engage in HIV medical care, remain in care, start ART and consistently adhere to ART.¹¹ Depression and substance abuse interfere with all of these globally.²⁶ Lack of resources, cultural explanations of psychiatric disorders, low health and mental health literacy, poor social supports, poverty, the need for secrecy

(nondisclosure) of HIV serostatus, denial and HIV-related stigma further contribute to the limited screening, diagnosis and treatment of mental and substance use disorders.²⁴ According to the World Health Organization, more than 95% of PLWHA reside in low and middle-income countries where resources are limited and research on mental illness of PLWHA is scant.²⁷

Among low and middle-income regions, the prevalence of HIV among adults in the Caribbean is nearly 1%, making it the next most affected region after sub-Saharan Africa. And within the Caribbean, the Dominican Republic and Haiti comprise close to 75% of the total burden of disease. Additionally, in 2004, the government of the Dominican Republic began a program for national provision of ART with recent estimates quoting coverage of the HIV-infected population at 80%.²⁸ Given the high burden of disease and the high rate of ART coverage, the Dominican Republic appears to be a valuable place for research on HIV and factors such as mental health that could influence adherence.

This cross-sectional study examined rates of depression, substance use, adherence to ART and HIV biomarkers and their associations on a sample of HIV-positive patients serviced by a general medical clinic, Clínica de Familia La Romana (CFLR), in La Romana, DR, a low-resource setting.

Methods

Setting and Participants

This study was conducted between September 28 and October 23, 2015 at Clínica de Familia La Romana (CFLR), a general medical clinic that provides HIV care and ART treatment to adults and children living with HIV in the DR. At the time of the study, CFLR was caring for over 1,600 adults with HIV/AIDS, 82.7% of whom were on ART.²⁹

CFLR was chosen as the site because it has an established track record for research, has hosted a large number of graduate students for such endeavors and, perhaps more importantly, was interested in evaluating the mental health of its population in an effort to continue improving the care it provides.

Spanish-speaking HIV-positive patients age 18 years or older attending CFLR and able to provide oral or written consent were eligible for recruitment in this study. They were either identified by their medical providers, as were most, or self-referred.

Study Instruments

The 2-page questionnaire included widely used measures validated in Spanish and was administered by a Spanish-speaking fourth year medical student researcher.

The PRIME-MD Patient Health Questionnaires (PHQ-2 and PHQ-9) are 2 and 9-item depression screeners. The PHQ-2 asks about whether an individual has experienced either depressed mood or loss of interest in activities (anhedonia) over the past two weeks, which are necessary criteria for a diagnosis of depression. A positive response to either of the two PHQ-2 items warrants administration of the PHQ-9 to determine whether the individual meets criteria for major depression. Administering the PHQ-2 first saves time by selecting out those individuals unlikely meet depression criteria. The PHQ-9 incorporates and expands on the PHQ-2; it is a nine-item measure that evaluates the occurrence and frequency of nine depressive symptoms during the past two weeks. Scores range from zero to 27 with higher scores indicating greater depression severity. Scores greater than ten indicate major depression (sensitivity of 88% and specificity of 88%).^{30,31}

The CAGE questionnaire adapted to include drugs (CAGE-AID) is a four-item screener for lifetime alcohol use and drugs other than alcohol. It is not a diagnostic tool. A "yes" to two or more of the four questions is considered clinically significant and indicates a potential substance use disorder that warrants further investigation.³² Scores greater than one (sensitivity of 79% and specificity of 77%) or greater than two (sensitivity of 70% and specificity of 85%) indicate a positive screen.³³

The Morisky Medication Adherence Scale (MMAS-4) is a four-item yes/no measure examining forgetfulness, carelessness, side effects and feeling better as factors interfering with adherence to a medication regimen.³⁴ Scores of greater than three indicate low adherence, of one to two medium adherence and of zero high adherence (sensitivity

81% and specificity 44%).³⁵

Every fourth or fifth participant was asked a series of open-ended questions designed by the researchers, ranging from questions about quality of life with HIV to more specific questions about adherence difficulties. It was decided that not all participants would be asked these questions in order to minimize disruption to the clinic's workflow. Additionally, these questions were potentially destabilizing, and there was limited infrastructure in place to provide the amount of emotional and logistical support that may be required to someone in profound distress.

The most recent (within the last six months) CD4 cell counts and HIV-RNA viral load were also abstracted from the participant's medical record. These two biomarkers are the gold standard for measuring HIV progression and severity.³⁶ CD4 cells are white blood cells that fight infection. Since HIV directly attacks the CD4 cell and uses the machinery within the cell to multiply and spread throughout the body, low CD4 cell counts in the presence of HIV infection indicate poor management of the disease. CD4 cell counts below 200 in HIV-infected individuals indicate advanced disease known as AIDS. Similarly, HIV-RNA viral load refers to the number of HIV virus particles in the blood: the higher the viral load, the less controlled the virus. Therefore, just like lower CD4 cell counts, higher HIV-RNA viral load indicates poorly controlled disease.

The study was approved by the Columbia University Medical Center Institutional Review Board (CUMC IRB) and the Consejo Nacional de Bioética en Salud (CONABIOS) in the Dominican Republic. All study materials were available in English and Spanish.

Analysis

Data analysis was carried out using the SPSS 23 (Statistical Package of Social Science program, version 23). Analysis included independent t-tests, Chi-square, and non-parametric tests. The aim of the analysis was first to describe the participants and second to test the association between depression, ART adherence, HIV-RNA viral load and CD4 cell count, as well as gender, origin, education, years lived with HIV, disease status shared, alcohol use and/or drug use. A p-value of < 0.05 was considered statistically significant. Qualitative analyses for the open-ended questions were conducted manually using Microsoft Excel for Mac 2011, version 14.6.

Results

Questionnaires were completed by 89 participants. CD4 cell counts and HIV-RNA viral loads were available for 88 and 87 participants, respectively. Results are organized into tables and graphs (see Appendix). The statistically significant results are identified below and in the tables with their respective p-values.

Sample Characteristics (Table 1)

Sociodemographics

The mean age of participants was 40.0 years old (Range 18-64; SD 10.9) and they were almost evenly divided between men (44.9%) and women (52.8%). Two participants identified themselves as transgender; their data was included in all the quantitative analyses except for the gender-specific ones where a sample size of two was insufficient to provide meaningful results. The majority of participants reported themselves as Dominican (73.0%), while the remaining 27% identified as Haitian or Dominican-Haitian. About half of the sample (46.1%) had completed only elementary school, 4.5% middle school, 28.1% high school, 10.1% no schooling and 11.2% university.

HIV clinical information

More than half of the participants (55.1%) had lived with HIV/AIDS for less than five years, with most of them (78.7%) reporting disclosing their HIV serostatus to someone. Almost all (89.9%) were taking ART medications. The sample mean CD4 cell count and detectable HIV-RNA viral load were 373.7 (SD 253.0) and 94,351.0 (SD 226,025.0), respectively. 24 participants (27.3%) had a CD4 cell count < 200 (i.e. laboratory AIDS diagnosis), while 34 (39.1%) had an HIV-RNA viral load < 20 copies/mL (undetectable).

Depression

80 participants (89.9%) scored positively on the PHQ-2, prompting the administration of the PHQ-9. The mean PHQ-9 was 10.6 (SD 4.7; threshold of 10 for major depression). The PHQ-9 is scored as follows: a score of five through nine represents mild depression, Ten through 19 moderate depression, and 20 or greater severe depression.

Most participants fell into the category of mild (31.3%) or moderate depression (33.8%), and two participants (2.5%) met criteria for severe depression. Mild depression represents a PHQ-9 score of five through nine, moderate depression

Of those meeting the threshold for major depression (PHQ-9 > 10), 66.7% were women, 70.5% were Dominican and 90.9% had received some level of education, very much paralleling the survey population. Additionally, 32 of the 44 participants meeting the threshold (72.7%) had a CD4 cell count > 200, while only 17 (38.6%) had an undetectable HIV-RNA viral load.

Substance Use

Seventy-seven participants (86.5%) reported lifetime use of drugs or alcohol and the sample mean CAGE-AID score was 1.0. Twenty-seven participants (30.3%) fit criterion for severe alcohol or drug use (score > 2). Thirteen and a half percent (13.5%) endorsed no alcohol or drug use and 56.2% endorsed moderate alcohol or drug use. The participants endorsing drug use in their lifetime used marijuana (n=8) and cocaine (n=5). In those participants with a CD4 cell count > 200, none to moderate alcohol or drug use was reported in 68.7%; severe alcohol or drug use was reported in only 31.3%. Similarly, in those with an undetectable HIV-RNA viral load, 70.6% reported none to moderate alcohol or drug use, while only 29.4% met criteria for severe alcohol or drug use.

ART Medication Adherence

80 participants (89.9%) were on ART as part of their HIV treatment. Based on the MMAS-4 instrument, 41.3% of those on ART had good adherence (score=0), whereas 58.7% had poor adherence (score > 1).³⁷ Of those with good ART adherence, more were women (56.3%) than men (43.8%), and more had disclosed their HIV serostatus to someone (72.7%) than had not. 26 of the 33 with good adherence (79.0%) had CD4 cell counts > 200 and 17 (51.5%) had an undetectable HIV-RNA viral load.

HIV Biomarkers

Because a CD4 cell count < 200 qualifies for a diagnosis of AIDS, we examined the characteristics of the healthier participants with CD4 cell counts > 200. In this cohort of 64 participants (62 for the gender analysis), 58.1% were women, 71.9% were Dominican, 89.1% had completed at least primary school and 79.7% had disclosed their HIV serostatus to someone.

Associations (Tables 1-3)

The two adherence behaviors had different mean PHQ-9 scores. Those with good ART adherence had a mean PHQ-9 of 9.4 (SD 5.0), while those with poor ART adherence had a mean of 11.2 (SD: 4.4).

Good ART adherence was associated with being Dominican: 84.8% of good adherents were Dominican, while only 15.2% were Haitian or Dominican-Haitian (p-value = 0.04). It was also linked to having completed at least primary school (p-value = 0.03).

Meeting the threshold for depression was connected to female gender (p-value = 0.01) and to the individual having disclosed his or her HIV serostatus to someone, with 88.6% of those meeting criteria having disclosed (p-value = 0.03).

Male gender was positively associated with alcohol or drug use (p-value < 0.01). Female gender and Dominican origin were associated with undetectable (suppressed) viral loads (p-value = 0.03 for both).

Additional information

For reasons stated in the Methods section, open-ended exploratory questions were asked of every fourth or fifth participant for a total of 17 participants. We were particularly interested in learning more about patient experiences living with HIV/AIDS and how life may or may not be different now, in addition to understanding the behaviors that promote excellent ART adherence and the barriers. The predominant mode of HIV acquisition reported was from a spouse or known romantic partner, with a large proportion of participants becoming aware of their diagnosis (i.e. getting tested) after personally getting sick or witnessing their partner get sick. The theme of turning a negative into a positive emerged; many commented that receiving the diagnosis of HIV encouraged them to make positive changes in their lives, like quitting smoking or drinking, becoming more religious and being more cautious in their sexual relationships.

It was common for the participants to report having been in denial immediately after diagnosis. However, most felt more in control of their illness at the time of the study, except one participant who specifically

mentioned that she wished she had “some other chronic illness, not HIV” because of the stigma and discrimination towards PLWHA. Feelings of isolation and hardship were frequently related to feeling obligated to “hide the diagnosis” from others, even if it had been disclosed to a close friend or family member, for fear of discrimination or being denied work.

The predominant theme regarding behavior promoting ART adherence was having a schedule or routine. The barriers, however, varied considerably and included side effects, emotions like “wanting to forget” or feeling alone and simply being too busy. Two participants reported “vicious cycles” of binge drinking while in treatment. Major concerns included loneliness, desire to go back to work and financial trouble.

Discussion

This cross-sectional study aimed to measure the prevalence of depression and substance use as well as explore the relationship between these illnesses, ART adherence and two HIV biomarkers in PLWHA receiving care at CFLR in La Romana, Dominican Republic. The results suggest that depression, substance use and ART non-adherence were common in PLWHA.

The largest barrier to excellent ART adherence in PLWHA was scheduling and a busy lifestyle. Interventions exist, but the most effective ones are multi-faceted, long-term and require full buy-in from the patient.³⁸ Co-existing depression and/or substance use that remain untreated complicate these HIV efforts even more.

Adherence and depression affected each other; there was a difference in the mean depression scores when separated by adherence behavior. While the association in this study was not statistically significant, this relationship is strongly supported in the literature and worth noting. It suggests that an ART non-adherent HIV-positive individual is more likely to be depressed, or that depression may increase the likelihood of ART non-adherence in PLWHA, both of which are reasons that screening for depression in PLWHA is essential.³⁹

Depression was also associated with an individual having disclosed their HIV serostatus. Cross-sectional studies on this issue disagree. Some have found that disclosure of HIV status is significantly and inversely related to depression, while others have found that disclosure is not protective against depressive symptoms. Some have found no association between the two.^{40,41} There are many reasons why depression and serostatus disclosure could be connected here, including that the disclosure event was met with a negative response or that there was a perceived or real lessening of support post-disclosure. In fact, PLWHA in the DR may inflate internalized stigma (i.e. worsen negative internal attitudes about themselves) by unknowingly and/or falsely exaggerating perceived HIV-related stigmas that exist in the community.⁴² A patient's feelings post-HIV serostatus disclosure and the specifics of the disclosure event warrant further attention.

Statistically significant gender differences also emerged. HIV-positive women were more at risk for depression than HIV-positive men; this aligns with the predominant literature on the subject as well as rates of depression in women versus men in the general population.⁴³ Possible explanations for the higher rate of depression in women include the burden born by women as the primary caretaker for family members (i.e. caring for others before caring for self), less education, single parenthood and social isolation (i.e. homemakers).^{44,45} HIV-positive men, however, had greater issues with substance use. That men in general suffer more from substance abuse than do women is well-supported.^{46,47,48} However, the role that HIV plays is complex. Substance use in HIV-positive men can pre- or post-date the acquisition of HIV and data changes with sexual orientation and sexual risk-taking behaviors.^{49,50} Subjects were not asked about infection timeline, sexual orientation or behaviors; future research could examine these subjects, as they are known to influence prevention and treatment interventions.^{41,51}

Lastly, the history of Haitian-Dominican relations on their shared island of Hispaniola is long, tragic and marked by violence. This has had significant psychological and socioeconomic ramifications for Haitians and even those of Haitian descent and undoubtedly affects health literacy and healthcare access and engagement.⁵² Though conflict goes back centuries, many cite the 1937 massacre under Dominican dictator Trujillo as the start of the current, persistent

tensions, where over 20,000 Haitians or Dominicans of Haitian descent were brutally massacred. To this day, Haitians continue to be subject to mistreatment including recent government rulings to strip hundreds of thousands of Haitian immigrants and their descendants of Dominican citizenship and threatening mass deportations.⁵³ The consequences of this history shone through in this study, as noted above, where country of origin played a strong role in adherence, CD4 cell count and HIV viral load. More specifically, Dominican origin was positively correlated with good adherence, and being Haitian or of Haitian descent correlated with lower CD4 cell counts and higher HIV-RNA viral loads, both of which indicate poor viral control and worse clinical statuses. The simple awareness among HIV medical providers and treatment centers of Haitian vulnerability has the potential to improve treatment of HIV in the Dominican Republic on both an individual and community level.

There were several limitations to this study. First, due to the small sample of convenience, results from this study are not generalizable. Second, because of the way the questions are worded (i.e. “have you ever”) MMAS-4 and CAGE-AID data only capture lifetime and not current problems. And third, the fact that this study was conducted in a clinic does not account for a potentially large number of PLWHA who are not connected to healthcare services.

Conclusion and Future Research

In summary, this study in a low-resource setting emphasizes the knowledge that depression and substance use correlate with poor adherence and poor HIV biomarkers. Consistent screening of depressive symptoms, with the PHQ-9 or a similar instrument, and of drug and alcohol use, with the CAGE-AID or its equivalent, would be beneficial on many levels, including improving HIV management.⁵⁴ Ideally, PLWHA who screen positively for depression or substance abuse would be referred to mental health professionals for evaluation and treatment. The most effective scenario would be a collaborative care model, whereby a patient's HIV and psychiatric care are consolidated under one roof, making it easier for both types of health care providers to discuss a patient's barriers to treatment with more ease. Funding for such systems in resource-poor settings has not yet caught up, so the hope is that studies like ours that support the need for these interventions will continue to build a strong case for them.

Both depression and substance use disorders in PLWHA can be effectively treated using multiple treatment modalities including pharmacotherapy and psychological interventions (e.g. various psychotherapies, including cognitive behavioral, behavioral activation, interpersonal and motivational interviewing, etc.).^{8,55} Psychotherapy is the mainstay of low-resource settings; however, if the funding is available, pharmacologic treatments are also useful for treating depression in PLWHA.³⁹ As a result of this and other research, CFLR is implementing a new antidepressant program in which providers have been trained to apply the PHQ-9, the Mini International Neuropsychiatric Interview and follow evidence-based algorithms for depression, which will include pharmacologic treatments.

Finally, a representative longitudinal study that collects data on the patients at multiple time points, as opposed to our one cross-section, or a clinical trial (i.e. randomizing PLWHA who screen positively for depression to a mental health intervention versus placebo and looking at changes in adherence patterns) could more rigorously examine the intersection of depression, substance use, demographics and HIV-related outcomes in this vulnerable population receiving care in a low-resource setting.

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Conflicts of Interest

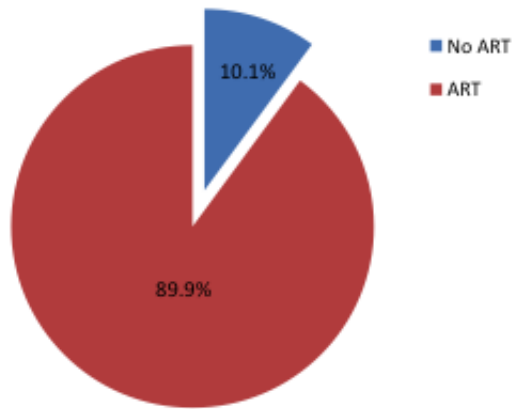
Authors claim no Conflicts of Interest.

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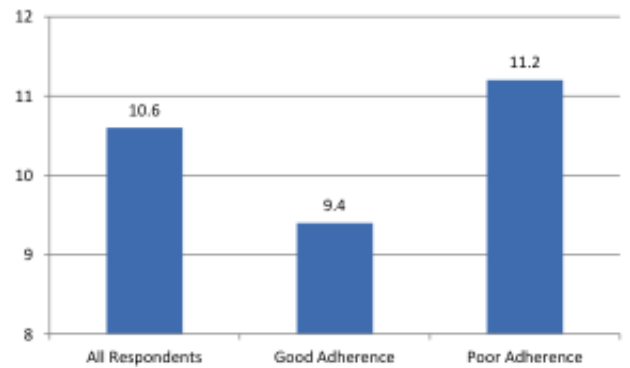
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Appendix: Charts and Figures

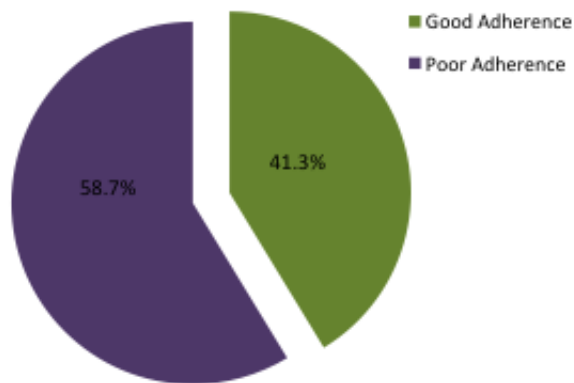
ART Adherence Rate



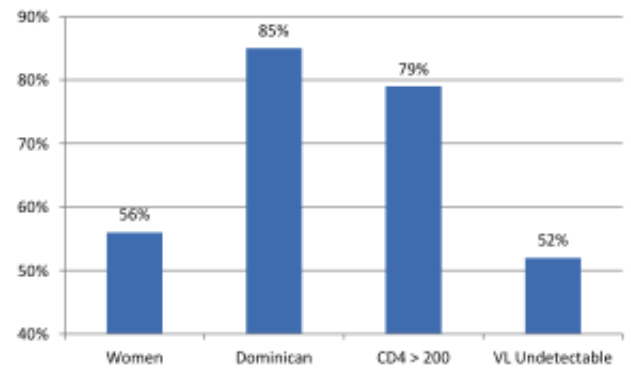
Mean PHQ-9 Score



Within Adherence, Percent Good or Poor



Good Adherence



CAGE-AID

