Personalized Medicine in Psychiatry 13–14 (2019) 1–5

Contents lists available at ScienceDirect

Personalized Medicine in Psychiatry

journal homepage: www.elsevier.com/locate/pmip

Integrated mental health and HIV care in a majority minority clinic

Marisa Echenique[a,*], Dominique Musselman[a], Victoria Bustamante Avellaneda[a], Lourdes Illa[b], Allan E. Rodriguez[a], Andrew Wawrzyniak[a], Michael A. Kolber[a]

[a] University of Miami Miller School of Medicine, United States
[b] Coastal Carolina Neuropsychiatric Center, United States

1. Introduction

One of the great medical successes of the recent era is making HIV/AIDS a chronic illness. As a consequence, however, within this success lay the subsequent management challenges of HIV-associated chronic comorbidities, especially those interfering with successful engagement and treatment of HIV itself in many cases. Especially relevant in this regard are that psychiatric disorders are highly prevalent amongst HIV infected individuals, with 30–50% of adults receiving HIV care in the US continuing to suffer with these recurrent, highly disabling disorders [1,2]. Specifically, the prevalence of depression in persons living with HIV is twice as high as for those without [3], tobacco or marijuana abuse is over 50% for those receiving primary care in an HIV safety net clinic [4], approximately 50% have neurocognitive impairment in university-based HIV care clinics [5], and another 30% of HIV-positive individuals suffer from Post-Traumatic Stress Disorder (PTSD) [6,7]. Fortunately, those who obtain psychiatric services and addiction treatment can have higher rates of antiretroviral (ARV) utilization and better viral control, as well as lower risk of early mortality [6,7]. There is considerable unexplained variation in the course of HIV and examining psychosocial predictors of disease progression in HIV has become a focus in HIV stabilization. Research has demonstrated the possibility that psychological variables such stress and may account for some of this unexplained variation. For example, Norepinephrine (NE), a neuro-hormone related to emotion and stress has been related to poor response to ARV therapy [6,7,30,31].

Provision of mental health illness services for HIV-infected population within an infectious diseases clinic has been shown to improve psychological variables mentioned above such as distress, stress, depression as well as biologic markers of HIV disease [8]. Yet only a minority of HIV-positive patients receives these services [2], even in the best-performing clinics which utilize case management, screening measures to detect care needs, continuous monitoring of measures of care quality, use of treatment guidelines, or collaborative, stepped care models. Nevertheless, the high prevalence of mental disorders among HIV-infected individuals combined with evidence that mental illness amongst this cohort is treatable [9] supports additional studies examining HIV-relevant outcomes when a broad screening of all patients presenting to such clinics reveals psychiatric disorders that potentially are missed by the primary care provider. In primary care settings in general and HIV primary care settings in particular, symptoms of psychiatric disorders are commonly under-identified or undertreated [9,31,32].

Thus, in order to better understand potential factors negatively impacting the utilization of available integrated mental health/HIV services, we report the results of screening by an embedded psychology service within a large HIV specialty clinic in a public county hospital setting, and examine factors associated with subsequent "after screening" initiation of mental health services at a nearby specialty mental health clinic (HIV MHC).

2. Methods

2.1. Participants

The University of Miami/Jackson Memorial Medical Center (UM/JMMC) Adult HIV Outpatient Clinic is the largest HIV clinic provider in Miami-Dade County and reflects the demographics of the inner city HIV population in Miami-Dade. The Clinic usually serves over 3000 individual patients, mostly minority patients, and every weekday [10]. The majority (> 85%) have some form of federal assistance for health care needs, either Medicaid or Ryan White, which is the primary medical care and essential support services for people living with HIV who are uninsured or underinsured. In addition, nearly half of the patients seeking HIV care in the clinic are foreign-born. The current interdisciplinary care model in the clinic offers integrated primary and HIV care, mental health, gynecology, high resolution anoscopy, and hepatitis C services, as well as associated on-campus case management, psychiatry, dental, ophthalmology and other medical specialties.

2.2. Integrative mental health/HIV model of care

Mental health screening and liaison services are embedded within the Clinic to decrease mental health stigma and improve access to

* Corresponding author at: 1695 NW 9th Avenue, 1208B, Miami, FL 33136, United States.
E-mail address: mechenique@med.miami.edu (M. Echenique).

https://doi.org/10.1016/j.pmip.2018.11.002

Available online 24 December 2018

mental health care. A clinical psychologist and one psychology fellow were available three days per week and randomly screened patients at the UM/JMMC Adult HIV Outpatient Clinic for mental health disorders at least once per year. The clinical psychologist is also readily available to the medical providers on a consultation basis to address patient mental health emergencies. Those persons identified as requiring further detailed assessment are provided with an appointment to the HIV mental health clinic (MHC) across the street from the Clinic for a more comprehensive biopsychosocial assessment and follow-up psychological and/or psychiatric treatment. The specialty HIV MHC's philosophy is based on an integrative patient-centered model of care that involves measurement-based treatment, and coordinated care of individual's overall health care needs utilizing case management [6,7].

2.3. Study design

This was a retrospective study of data extracted from the clinical registry of the Clinic at the University of Miami/Jackson Memorial Hospital (UM/JMH). Patients newly presenting or continuing their care at the UM/JMMC Adult HIV Outpatient Clinic between January 2010-December 2011 were offered a mental health screening. Patients new to the Clinic were evaluated during a comprehensive intake appointment, including a medical history, physical exam, access to case management, and laboratory testing. Patients were HIV-infected, and at least 18 years of age. Data were extracted from a clinical registry and de-identified by the database manager prior to entry into the institutional review board-approved registry to protect the confidentiality of patients.

2.4. Mental health screening

Given the ethnic diversity of the population served at the Clinic, the 60–90 min mental health screens were administered in English, Spanish or Creole by the clinical psychology team. The structured interview began with gathering relevant HIV-related information: date of HIV diagnosis, mode of transmission, disclosure (or not) to partner and others, perceived support for illness, adherence to medications, coping styles, history of past and present sexual, physical abuse and/or neglect, and past psychiatric history including previous suicidal attempts. Participants were then administered the Primary Care Evaluation of Mental Disorders Patient Health Questionnaire (PRIME MD PHQ), a psychometric instrument containing modules for mental health disorders of depression (9 items), anxiety (4 items), panic (15 items) PTSD (4 items), substance use (4 items), psychosis (3 items) and cognition (2 items). Specifically, the cognitive module included two items, a memory recall of 4 words and a psychomotor speed exercise [11]. Four items related to PTSD secondary to HIV were added. Severity of depressive symptoms was also quantified by the PRIME MD PHQ.

2.5. Statistical analysis methods

Data was entered into the Statistical Package for Social Sciences (SPSS, Chicago) version 21. Descriptive analyses were conducted included frequencies, means and standard deviations. Logistic regression was used for assessment of associations between dependent and independent variables. The dependent variable was defined as initiation of mental health services. The initiation of mental health services means that the patient attended first appointment to the outpatient mental health clinic. This appointment was provided upon completion of mental health screening at medical visit. The independent variables were the socio-demographic and clinical variables, which included: age, gender, ethnicity, mode of transmission, time since diagnosis, disclosure status, adherence to antiretroviral therapy (ART), history of psychiatric treatment and results of the mental health screen. Independent variables that were associated with the dependent variable at $p \leq 0.05$ were entered into a logistic model. Variables were removed from the model through a stepwise iterative process if their contribution to the overall model was greater than or equal to a p value of 0.10 [12]. A total of HIV mRNA loads (n = 665) and absolute CD4 counts (n = 664) were available at the time of screening or within 1–2 months of screening. Correlational analyses were used to determine the relationship between the patient's CD4 count and viral load. Non-suppressed viral load was considered as less than 50 copies/μL.

Table 1
Sociodemographic and medical characteristics of study population at screening.

Characteristics	Total (n = 668)
Age	
At Screening (years) *mean (range)*	46.2 (11.4, 18–76)
At diagnosis of HIV (years) *mean (range)*	37.1 (11.3, 6–74)
Time since diagnosis (years) *mean (range)*	9.8 (7.1, 0.2–32)
Gender	
Female *n* (%)	320 (47)
Race	
African American *n* (%)	272 (40)
Hispanic *n* (%)	211 (30)
Haitian *n* (%)	179 (26)
Caucasian *n* (%)	25 (4)
Mode of Transmission	
Heterosexual contact *n* (%)	460 (67)
MSM contact *n* (%)	172 (25)
IV drug use *n* (%)	48 (7)
Blood product *n* (%)	7 (1)
Immune-Relevant	
Detectable HIV Viral Load *n* (%)	356 (54)
CD4 Absolute Count < 200 cells/ml *n* (%)	130 (20)

3. Results

3.1. Demographics, safe sex practices and HIV-disclosure

Of 2500 individual largely low, income, minority patients presenting to the clinic over a 12-months period, 668 were randomly selected based on patient's availability to be seen by mental health team. Table 1 shows that the HIV-infected individuals who completed mental health screening at the Adult HIV outpatient clinic at UM/JMH at least once between 2010 and 2011. On average, these were middle-aged, minority men and women; their HIV infection had been diagnosed on average 10 years earlier in their late 30's, contracted via heterosexual sex.

3.2. Results of the mental health screening at the UM/JMMC adult HIV outpatient clinic

Three-quarters of those interviewed screened positive in at least one module of the PRIME MD PHQ (Table 2); the mean number of psychiatric modules endorsed was 2.5 (range 1–8, SD 1.4). Nearly two-thirds (n = 421) endorsed anxiety, and almost half (48%, n = 322) reported depression. Regarding PTSD, 23% (n = 157) of those screened endorsed symptoms, and of those nearly all (n = 139, 88%) identified the HIV diagnosis as the primary trauma related to their PTSD. Nine percent (n = 57) were positive for substance use within the last six months. Six percent of the sample (n = 41) reported suicidal ideation at time of screen. Twenty-eight percent (n = 286) were screen positive for cognitive impairment. Of those with cognitive symptoms, nearly half (n = 139/286) were screen positive in at least other PRIME module. Twenty percent of the sample (n = 133) reported having experienced sexual and/or physical abuse or neglect during their lifetime, of those 14% (n = 94) experiencing the abuse during childhood and 2% (n = 11) reporting current abuse at the time of the screen.

Table 2
Prevalence of symptoms as screened by the primary care evaluation of mental disorders patient health questionnaire (PRIME MD PHQ).

Prevalence	N (%)
Positive at Time of Screen	493 (72)
Anxiety disorder (other than PTSD)	421 (63)
Depressive Disorder	322 (48)
PTSD	157 (23)
PTSD due to HIV diagnosis	139 (20)
Substance use disorder	57 (9)
Panic disorder	38 (6)
Suicidal ideation	41 (6)
Cognitive deficits	333 (49) vs. 286 (28)
Mixed mood/anxiety symptoms + and cognitive deficits	139 (20)
Cognitive deficits only	51 (7)
Trauma	
History of sexual/physical abuse or neglect	133 (20)
Abuse at screen	11 (2)
Abuse during childhood	94 (14)
Prior History of Psychiatric Treatment	** (**)

3.3. Associations between absolute CD4 count, and HIV mRNA viral load, depression and cognitive symptoms

Three hundred and fifty six patients (54%) had a non-suppressed viral load and 130 (20%) had an absolute CD4 cell count less than 200 cells/μL. Only two psychiatric modules were associated with a non-suppressed viral load and absolute CD4 count < 200: depression and cognitive impairment. Moreover, 210 (59%) patients with non-suppressed viral load screened positive for depression, whereas of the 309 patients with a suppressed viral load, 142 (46%) screened positive for depression.

Patients with a higher viral load at screening were also more likely to be screen positive for cognitive impairment than patients with a lower viral load (median VL 38,873 c/ml, r = 0.08, p = .027). Results also showed a significant difference between the cognitive status of patients based on their CD4 and viral load count. Patients with a higher viral load at screening were more likely to be screened as having a cognitive impairment than patients with a lower viral load (median VL 38,873 c/ml, r = 0.08, p = .027). Conversely, patients with higher CD4 cell count were more likely to be identified as screening positive for cognitive impairment than patients with a higher lower absolute CD4 count (median CD4 = 425 mm^3, r = 0.12, p = .002).

Although 206 (58%) of the 356 patients with non-suppressed viral load screened positive for cognitive impairment, even of those with a suppressed viral load, 41% of those patients (n = 127) screened positive for cognitive impairment, comprising approximately half (n = 333) of our patient population. Conversely, of those patients who screened positive for cognitive impairment, only 44 (15%) had a CD4 cell count of less than 200 cells/μL. A total of 394 (82%) individuals without cognitive impairment had a CD4 cell count of more than 200 cells/μL. After adjusting for age and viral load, there was a significant difference in the average CD4 cell count between those with cognitive impairment (n = 190) and individuals without (n = 497, p = 0.025).

As expected, there was a strong negative correlation between viral load and CD4 absolute count [rho (651) = −0.46, p = < 0.01], and between viral load and CD4% (rho (658) = −0.43, p = < 0.01).

3.4. Utilization of subsequent services at the HIV mental health clinic after HIV medical clinic screening

All patients who screened positive on any of the PRIME modules were offered an appointment at the nearby HIV MHC. Less than 10% were receiving mental health services at the time of screening. Of the 493 individuals with a positive mental health screen, 35% (n = 171) initiated mental health services at the HIV MHC on campus after the mental health screen (Table 3). Those having a previous psychiatric diagnosis by a mental health professional or other physician, or prior treatment for such, were more than 2.5 times more likely to initiate mental health services (OR = 2.741, 95% CI 1.639–4.583). Severity of depressive symptoms at screening (OR = 1.13, 95% CI 1.054–1.217) was also positively associated with attending a mental health service appointment.

Table 3
Logistic regression analysis of characteristics associated with subsequent mental health after screen.

Variable	B	SE	P	OR	CI	
					Lower	Upper
Previous Psychiatric History						
Yes	1.008	0.262	.000**	2.741	1.639	4.583
No (reference)						
Substance Use	−0.748	0.378	.048*	0.473	0.226	0.993
Yes						
No (reference)						
Depression Severity*	0.124	0.037	.001**	1.132	1.054	1.217
Ethnicity						
Haitian	−0.789	0.432	.030*	0.454	0.223	0.927
Non-Haitian (reference)						

*p < .05, **p < .01, B = unstandardized beta, SE = standard error, P = probability value, OR = odd ratio, CI = confidence Interval.

Of the 65% of patients who "screened positive" with the PRIME screen, and did not attend a subsequent follow-up appointment with the HIV MHC, ongoing substance abuse was inversely related to initiating post-screening mental health services (OR = 0.473, 95% CI 0.226–0.993). Being of Haitian background was also inversely related to initiating mental health services (OR = 0.454, 95% CI 0.223–0.927).

4. Discussion

This study, similar to others, documents the previously high prevalence rates of psychiatric symptoms across a spectrum of diagnoses within a "majority minority", urban primary care HIV clinic, as detected by screening instrument. However, this study also documents an additional high rate of subsequent "non"-attendance at a nearby HIV MHC, despite an intensive screening interview by embedded psychologists. The nearly 75% "screen positive" prevalence of HIV-infected persons is greater than other clinics utilizing screening instruments [13], perhaps in part because over a quarter of those interviewed in clinic could not successfully perform the memory recall and/or psychomotor speed task, thereby "screening positive" for cognitive impairment. The module of psychiatric symptomatology endorsed by the most patients, anxiety symptoms, was not associated with HIV-relevant immune variables of viral load and absolute CD4 count, or avoidance of subsequent follow-up at the HIV MHC. In contrast, other investigators have reported that anxiety symptoms are associated with increased viral load [14]. Only those who endorsed depression symptoms and exhibited cognitive symptoms not any other type of symptoms, were more likely to have not achieved viral suppression [13]. In fact, we observed those who screened positive for cognitive dysfunction were more likely to higher viral load *and* a lower CD4 count. Neither age at diagnosis nor years since diagnosis were significantly associated with non-suppressed viral load, suggesting that those many years after diagnosis, at any age, can fall prey to inconsistent ART utilization [15].

In fact, when taken in this context, the presence of non-suppressed viral load in previously effectively treated persons has been proposed as a clinical marker of untreated co-morbid depression [16,32]. Moreover, non-suppressed viral load was not associated with race and gender, in

contrast to other studies comprised of largely, low-income HIV positive persons [13] possibly in part because of the low numbers of Caucasian patients receiving treatment in our clinic, and the positive factors that lead women to seek treatment at our clinic (e.g. a preponderance of female case managers, or opportunity for OB and GYN care).

Severity of depressive symptoms at screening (OR = 1.13, 95% CI 1.054–1.217) was also positively associated with attending a mental health service appointment. Another variable, those having a previous psychiatric diagnosis by a mental health professional or other physician, or prior treatment for such, were more than 2.5 times more likely to initiate mental health services, possibly reflecting chronicity of their symptoms. Though chronicity and severity of symptoms are variables not usually quantified in collaborative care studies [17] those with less severe and time-limited symptomatology may have not felt the same sense of urgency to seek services [18], similar to persons with other chronic disorders, e.g. type 2 diabetes. Conversely, those previously diagnosed and suffering chronicity of their depressive symptoms, may have been more amenable to antidepressant treatment, as psychotropics are typically not prescribed by our primary care HIV clinic providers. Indeed, within our specialty HIV MHC, HIV positive persons more often seek medication management, than psychotherapy (individual or group) alone, or psychotherapy combined with medications [9].

Similar to other investigators [19], PTSD was not associated with viral load or absolute CD4 count, even though almost 90% of those who reported PTSD symptoms listed HIV as their traumatic event. We found that HIV-related PTSD was not associated with failure to disclose to partner or non-suppressed viral load unlike other investigators [6,7]. That the presence of PTSD symptoms, and alcohol or drug use disorders, was *not* associated with a negative impact upon attainment of viral suppression, might be due at least in part, to the avoidance/inability to attend even their HIV medical clinic appointments. In comparison to persons who were “screen negative” for cognitive dysfunction, those persons who were “screen positive” did exhibit greater viral load (arguably a marker of ART noncompliance), but were able to appear for subsequent follow-up at the HIV MHC.

Our study is limited by its retrospective design, which is inherently dependent on the quality of the data documented at the time of the clinical encounter. Furthermore, not all patients were screened in our HIV outpatient clinic, and our findings do not speak to the psychiatric presentation or mental health utilization rates of HIV positive persons who receive their primary care in private medical practice. We also did not index by objective means which might underlie certain of the relationships we report, in that substance abuse was via self-report nor did we quantify non-adherence to ART by confirmation of prescription pickup, both of which may act as a confounding variable to our findings. Though the choice of psychometric tests, and challenges of screening for neurocognitive dysfunction, especially in HIV positive minority populations are beyond the scope of the current discussion, we could have arguably screened for relevant deficits in functional capacity, e.g. communication, medication intake or making appointments shown to correlate neurocognitive deficit (r = 0.60–0.65) [20] and more recently have been shown to identify HIV positive persons with cognitive impairment with 71% accuracy [21].

Calsyn and colleagues [22], have discussed strategies recruiting, engaging, and retaining individuals with triple diagnoses (HIV, mental health, substance) in both treatment and research, including offering comprehensive services on a 24-hour basis, in a culturally competent manner, and offering financial incentives and using outreach workers for those engaging in longitudinal studies. The fact that our 35% rate of subse quent follow-up at the specialty MH HIV clinic was comparable with other studies for HIV patients chronically in care with these additional resources to facilitate initiation of mental health services [23,24], suggests that our model of embedded “in-clinic” psychological screening may be largely effective, especially for a those with past psychiatric history and patients with more severe depressive symptoms. However, persons with substance use disorders, may warrant those extra resources, as they were less likely attend a follow-up appointment at the specialty MH HIV clinic [25].

Another group of patients who were less likely to attend pursue mental health care were HIV seropositive individuals of Haitian background. Unlike most HIV clinics in the US, our sample consisted of a large number Haitians and relatively few Caucasians, highlighting Miami’s multicultural composition. In fact, the only demographic variable associated with mental health service initiation was ethnicity; Haitian ethnicity was inversely associated with initiation of mental health services, consistent with previous research demonstrating that Haitians are less likely to report using mental health services than other ethnic minorities [26-29]. Our results suggest that mental health screening and immediate referral may not be sufficient for HIV-infected Haitians to initiate mental health care and that Haitians may require a more culturally sensitive approach to facilitate initiation of mental health services. Another limitation of this study is that the mental health screening used in this study has not been validated among Haitians.

Our findings are consistent with other studies as regards lower health service utilization for Haitians may stem from both an inability to navigate and trust those providing the carefully and stigma associated with having mental health issues in the Haitian culture [10,26]. We offer that further studies are needed on how to best engage Haitian patients into HIV-related mental health care, such as utilization of a co-localized clinic psychiatry consultation service embedded within an infectious diseases outpatient clinic at our urban tertiary hospital [8]. Nevertheless, given the lack of available validated measures for this unique population and results consistent with existing literature regarding reluctance of other underserved minority persons [10], we believe our results provide clinically relevant information. Another limitation was the retrospective nature of the clinical registry database, which we recognize was missing important clinical information such as epidemiological data. Moreover, due to limitations in clinical information collected, the study was not designed to assess the potential interaction between certain demographic variables that potentially may impact accessing mental health services.

Nevertheless, we offer this study has several strengths. The study describes results of an integrated mental health/HIV model of care in a real world clinical setting. Understanding the psychiatric presentation of HIV-infected patients is critical in developing an integrated healthcare model that is effective and sustainable [30]. Unlike many research studies, our mental health screening did not have any exclusion criteria. Persons in our clinic are screened for mental health concerns, regardless of the severity of psychiatric symptoms or presence of psychotic symptoms, substance use, cognitive deficits or acute risk of self-harm. Additionally, no incentives or additional resources were provided to optimize attendance to appointments, and patients were responsible for securing transportation and navigating insurance referrals or other organizational processes. Specifically, our integrated mental health/HIV model of care, which provided routine screening, structured referral system and fostering of therapeutic engagement, has proven to be effective in increasing early identification of mental health concerns and improving access to care. Perhaps one of the most important contributions of this study is that it demonstrates the feasibility of implementing this model in resource-limited busy medical outpatient settings. The essential components required to replicate our model include: 1) a psychologist knowledgeable in HIV mental health present during clinics to conduct mental health screenings, 2) cooperative agreements with community mental health providers and 3) a structured referral system to a specialty HIV MHC, supported by case managers. We propose that our model can serve as a framework for the implementation of integrated mental health/HIV services in routine HIV specialty care.

Declarations of interest

None.

Funding

There were no funds received for this manuscript. The study is effectively the retrospective analysis of the clinical care. There is no funding for the analysis.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.pmip.2018.11.002.

References

[1] Soller M, Kharrazi N, Prentiss D, et al. Utilization of psychiatric services among low-income HIV-infected patients with psychiatric comorbidity. AIDS Care 2011;23(11):1351–9.
[2] Yehia BR, Stephens-Shield AJ, Momplaisir F, Taylor L, Gross R, Dubé B, et al. Health outcomes of HIV-infected people with mental illness. AIDS Behav 2015;19(8):1491–500.
[3] Ciesla JA, Roberts JE. Meta-analysis of the relationship between HIV infection and risk for depressive disorders. Am J Psychiatry 2001;158(5):725–30.
[4] Dawson-Rose C, Draughon JE, Zepf R, Cuca YP, Huang E, Freeborn K, et al. Prevalence of substance use in an HIV primary care safety net clinic: a call for screening. J Assoc Nurses AIDS Care 2017;28(2):238–49.
[5] Heaton RK, Clifford DB, Franklin DR, Woods SP, Ake C, Vaida F, et al. HIV-associated neurocognitive disorders persist in the era of potent antiretroviral therapy CHARTER Study. Neurology 2010;75(23):2087–96.
[6] Martínez MA, Clotet B, Esté JA. RNA interference of HIV replication. Trends Immunol 2002;23(12):559–61.
[7] Machtinger EL, Haberer JE, Wilson TC, Weiss DS. Recent trauma is associated with antiretroviral failure and HIV transmission risk behavior among HIV-positive women and female-identified transgenders. AIDS Behav 2012;16(8):2160–70.
[8] Coleman SM, Blashill AJ, Gandhi RT, Safren SA, Freudenreich O. Impact of integrated and measurement-based depression care: clinical experience in an HIV clinic. Psychosomatics 2012;53(1):51–7.
[9] Primeau MM, Avellaneda V, Musselman D, St. Jean G, Illa L. Treatment of depression in individuals living withHIV/AIDS. Psychosomatics 2013;54(4):336–44.
[10] Glémaud M, Illa L, Echenique M, Bustamente-Avellaneda V, Gazabon S, Villar-Loubet O, et al. Abuse and mental health concerns among HIV-infected Haitian women living in the United States. J Assoc Nurses AIDS Care 2014;25(1):S62–9.
[11] Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med 2001;16(9):606–13.
[12] Field A. Discovering statistics using SPSS. London: Sage; 2005.
[13] Pence BW. The impact of mental health and traumatic life experiences on antiretroviral treatment outcomes for people living with HIV/AIDS. J Antimicrob Chemother 2009;63(4):636–40.
[14] Shacham E, Small E, Onen N, Stamm K, Overton ET. Serostatus disclosure among adults with HIV in the era of HIV therapy. AIDS Patient Care and STDs 2012;26(1):29–35.
[15] Carrico AW, Riley ED, Johnson MO, Charlebois ED, Neilands TB, Remien RH, et al. Psychiatric risk factors for HIV disease progression: the role of inconsistent patterns of anti-retroviral therapy utilization. J Acquired Immune Deficiency Syndromes (1999) 2011;56(2):146.
[16] Amanor-Boadu S, Hipolito MS, Rai N, McLean CK, Flanagan K, Hamilton FT, et al. Poor CD4 count is a predictor of untreated depression in human immunodeficiency virus-positive African-Americans. World J Psychiatry 2016;6(1):128.
[17] Johnson PJ, Ghildayal N, Rockwood T, Everson-Rose SA. Differences in diabetes self-care activities by race/ethnicity and insulin use. The Diabetes Educator 2014;40(6):767–77.
[18] Padilla VL, Rustad JK, Harvey PD, Wasserman B, Ziemer D, Musselman DL. Neurocognitive impairment in patients with comorbid diabetes mellitus and depression. Personalized Med Psychiatry 2017;1–2:2–10.
[19] Rubin LH, Pyra M, Cook JA, Weber KM, Cohen MH, Martin E, et al. Post-traumatic stress is associated with verbal learning, memory, and psychomotor speed in HIV-infected and HIV-uninfected women. J Neurovirol 2016;22(2):159–69.
[20] Daniel Elbirt MD, Mahlab-Guri K, Bazalel-Rosenberg S, Attali M, Asher I. HIV-associated neurocognitive disorders (HAND); 2015.
[21] Moore RC, Fazeli PL, Jeste DV, Moore DJ, Grant I, Woods SP, HIV Neurobehavioral Research Program (HNRP) Group. Successful cognitive aging and health-related quality of life in younger and older adults infected with HIV. AIDS Behav 2014;18(6):1186–97.
[22] Calsyn RJ, Klinkenberg WD, Morse GA, Miller J, Cruthis R. Recruitment, engagement, and retention of people living with HIV and co-occurring mental health and substance use disorders. AIDS Care 2004;16(Suppl. 1):S56–70.
[23] Marks G, Gardner LI, Craw J, Crepaz N. Entry and retention in medical care among HIV-diagnosed persons: a meta-analysis. Aids 2010;24(17):2665–78.
[24] Mugavero MJ, Amico KR, Westfall AO, Crane HM, Zinski A, Willig JH, et al. Early retention in HIV care and viral load suppression: implications for a test and treat approach to HIV prevention. J Acquired Immune Deficiency Syndromes (1999) 2012;59(1):86.
[25] Meyer VJ, Rubin LH, Martin E, Weber KM, Cohen MH, Golub ET, et al. HIV and recent illicit drug use interact to affect verbal memory in women. J Acquired Immune Deficiency Syndromes (1999) 2013;63(1):67.
[26] Jackson JS, Neighbors HW, Torres M, et al. Use of mental health services and subjective satisfaction with treatment among Black Caribbean immigrants: results from the National Survey of American Life. Am J Public Health 2007;97(1):60.
[27] Malow R, Dévieux JG, Stein JA, Rosenberg R, Jean-Gilles M, Attonito J, et al. Depression, substance abuse and other contextual predictors of adherence to antiretroviral therapy (ART) among Haitians. AIDS Behav 2013;17(4):1221–30.
[28] Allen JD, Mars DR, Tom L, Apollon G, Hilaire D, Iralien G, et al. Health beliefs, attitudes and service utilization among Haitians. J Health Care Poor Underserved 2013;24(1):106–19.
[29] Dieujuste C. The concept of stigma in mental illness as applied to Haitian Americans. Int Nurs Rev 2016;63(2):200–7.
[30] Satre DD, DeLorenze GN, Quesenberry CP, et al. Factors associated with treatment initiation for psychiatric and substance use disorders among persons with HIV. Psychiatric Serv 2013;64(8):745–53.
[31] Magidson JF, Skeer MR, Mayer KH, Safren SA. Prevalence of psychiatric and substance abuse symptomatology among HIV-infected gay and bisexual men in HIV primary care. Psychosomatics 2015;56(5):470–8.
[32] Ironson G, O'cleirigh C, Kumar M, Kaplan L, Balbin E, Kelsch CB, et al. Psychosocial and neurohormonal predictors of HIV disease progression (CD4 cells and viral load): a 4 year prospective study. AIDS Behav 2015;19(8):1388–97.