AIDS Behav (2018) 22:800–805
https://doi.org/10.1007/s10461-016-1666-5

ORIGINAL PAPER

Suicidal Ideation Persists Among Individuals Engaged in HIV Care in the Era of Antiretroviral Therapy

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Published online: 6 January 2017

Abstract Little research has focused on suicidality in the era of successful antiretroviral therapy among those engaged in HIV care. We performed a study of 648 clinic patients who completed a psychological and behavioral annual assessment in 2012. Depressive symptoms were measured using the Patient Health Questionnaire-9 (PHQ-9), suicidal ideation was measured by the last item of the scale. Anxiety symptoms were measured using the Generalized Anxiety Disorder-7 questionnaire (GAD-7). HIV biomedical markers were abstracted from medical records. Suicidal ideation was reported among 13% (n = 81) of the sample. Individuals endorsing suicidality were more likely to have unsuppressed viral loads, moderate to severe anxiety symptoms and consider themselves to be homeless ($p < 0.01$ for all). After adjusting for confounders, homeless individuals and those endorsing moderate to severe anxiety symptoms had higher odds of reporting suicidality. Results suggest basic needs must be met to complement HIV management efforts. Furthermore, better understanding of how psychological distress symptoms are expressed and how to manage them may better inform barriers to HIV management.

Resumen Poca investigación se ha centrado en tendencias suicidas en la época de la terapia de antirretroviral exitosa entre los que se dedican en el cuidado del VIH. Se realizó un estudio de 648 pacientes de clínica que completaron una evaluación psicológica y de comportamiento anual en 2012. Ideación suicida se midió con el cuestionario, Patient Health Questionaire-9 (PHQ-9). Los síntomas de ansiedad se midieron utilizando el cuestionario, Generalized Anxiety Disorder-7 (GAD-7). Se extrajeron los marcadores biomédicos de VIH de expedientes médicos. Ideación suicida se informó entre 13% (n = 81) de la muestra. Individuos que tendencias suicidas eran más propensos a haber tenido cargas virales no suprimidas, síntomas de ansiedad desde modera a severa y sin hogar ($p < 0.01$ para todos). Después de ajustar por factores de confusión, personas sin hogar y con ansiedad tenían más probabilidades de informar tendencias suicidas. Resultados sugieren que las necesidades básicas deben cumplirse para complementar los esfuerzos de manejo de VIH. Además, mejor comprensión en cómo se expresan los trastornos psicológicos pueden informar mejor a las barreras a la gestión del VIH.

Keywords HIV · Depression · Suicidal ideation · Psychological distress

Palabras claves VIH · Depresión · Ideación suicida · Trastornos psicológicos

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Introduction

HIV infection has become a chronic disease to manage among individuals who have access to medications. Yet, only about 21% of the individuals with HIV have suppressed viral loads, which rely on adherence to care and medication [1]. Identifying and addressing barriers to

adherence is necessary to improve health outcomes among populations with HIV and to prevent new HIV infections.

Approximately 37% of homeless individuals have reported suicidal ideation in the United States [2]. In a systemic review of sexual minority populations, it was reported that those who identified as lesbian, gay, and bisexual were two times more likely to have suicidal attempts than their heterosexual counterparts [3]. Specific to suicidality in the context of HIV infection, suicide rates among people living with HIV/AIDS (PLWHA) were more than three times higher than the rates of the general population in 2009 [4]. Specifically, suicidal ideation (also known as suicidality) has been documented to occur among populations with HIV, yet little has been examined in the era of successful antiretroviral therapy (ART) [5, 6]. Predictors of suicidal ideation in PLWHA include acquiring knowledge of being HIV positive, an increase in physical symptoms due to diagnosis, social stigma of being HIV positive, a history of mental illness and drug use, and previous suicide attempts [7–9]. It is particularly concerning that not only are PLWHA experiencing barriers to adherence to medication, but suicidal ideation persists in these populations that have access to medical care. We hypothesize that PLWHA who express suicidal ideation are likely to have unsuppressed viral loads due to medication nonadherence.

Psychiatric disorders, such as depression and anxiety, are more common in people living with HIV/AIDS (PLWHA) than in the general population [10]. According to the National HIV Costs and Service Utilization Study (HCSUS) in 2015, it is estimated that 48% of those who were diagnosed with HIV have a psychiatric disorder [11]. Most commonly, PLWHA have reported high rates of mood and substance use disorders. Such disorders and experiences have been identified as factors that prevent adherence to care and medication [12, 13]. Thus, the purpose of this study is to assess factors related to suicidal ideation among a sample of individuals enrolled in HIV care at a Midwestern urban clinic who have access to ART medications.

Methods

Participants were recruited from a midwestern U.S. infectious diseases clinic. Patients with HIV and 18 years or older were eligible to participate in this cross-sectional study, which consisted of completing a psychological and behavioral annual assessment during routine visits. Data were abstracted from medical records: age, race, gender, employment status, annual income, HIV viral loads, CD4 cell counts, and current receipt of ART. All data were collected in 2012. The Washington University Human Protections Office and Saint Louis University Institutional Review Board approved the study protocol.

Symptoms of depression and suicidal ideation were assessed using the Patient Health Questionnaire-9 (PHQ-9), which has 88% sensitivity and specificity [14]. Suicidal ideation was defined by the PHQ-9 scale developers as a Likert scale from 0 (not at all) to 3 (nearly every day) in reference to the statement, "*thoughts that you would be better off dead or of hurting yourself in some way*" in the two weeks preceding the completion of the assessment [14]. Anxiety symptomology were measured using the general anxiety disorder-7 (GAD-7) scale [15]. The alcohol-related disease impact (ARDI) application was used to calculate the average daily alcohol consumption [16]. Individuals were considered to be on ART if they were receiving $\geq$3 antiretroviral drugs.

Data Analyses

Demographic characteristics were categorized and included gender, education level ($\leq$high school graduate/GED or >high school degree), annual income (<$10,000 and $\geq$$10,000), race (African American/other minorities or Caucasian), employment status dichotomized into unemployed (including receiving disability benefits) and employed (part- or full-time), currently homeless status, and the number of sexual partners in the previous three months (categorized into no partners, one partner, or more than two partners).

Biomedical predictor variables were categorized in the following manner: their most recent HIV RNA viral load (<200 copies/mL or $\geq$200 copies/mL), most recent CD4 cell counts (<200 cells/mm^3 or $\geq$200 cells/mm^3), and actively on ART medications. According to the Centers for Disease Control and Prevention (CDC), the ARDI application averages alcohol consumption based on then number of days per week the patient drank multiplied by the average frequency of drinks on days they indicated drinking [16]. The average amount of alcohol drank per week was then assessed for the sample and dichotomized (<8 drinks or $\geq$8 drinks per week). As defined by the PHQ-9, scores $\geq$10 represented depressive symptomology versus scores <10. Anxiety symptomology, as determined by the GAD-7, was dichotomized as GAD score $\geq$10 or non-GAD score of <10 [15]. The outcome variable was suicidal ideation and dichotomized to either no (none of the days) versus yes ($\geq$1 several days to nearly every day experienced) [14].

Descriptive and bivariate analyses were conducted to assess the sample. Student's *t*- test, χ^2 tests, and Fisher's

exact tests were used to assess the relationship between sociodemographic factors and HIV-related biomedical markers with suicidal ideation. Multivariate logistic regressions were used to identify the independent predictors of risk of suicidal ideation in the sample, and included all covariates with $p < 0.05$ established in the bivariate correlations. Then, covariates were retained in the final regression model if they changed the effect size between exposure and outcome by more than 10%, indicating a confounding effect. Final models were also tested using Hosmer–Lemeshow for goodness of fit. Data was analyzed using SAS Version 9.4 for Windows (SAS Institute Inc., Cary, NC, USA).

Results

A total of 648 clinic patients completed their psychological and behavioral annual assessment during a routine visit in 2012. Approximately 69% (n = 445) of the sample was

Table 1 Summary of total sample characteristics and those with and without suicidal ideation

	Total sample (n = 648)	Suicidal ideation (n = 81)	No suicidal ideation (n = 545)	p[a]
Gender				0.20
Female	190 (29.3)	30 (37.0)	153 (28.1)	
Male	445 (68.7)	49 (60.5)	383 (70.3)	
Transgender	13 (2.0)	2 (2.5)	9 (1.7)	
Age (years)				0.16
18–24	45 (7.1)	9 (11.3)	36 (6.7)	
25–44	294 (46.1)	42 (52.5)	242 (45.2)	
45–64	282 (44.2)	28 (35.0)	242 (45.2)	
65+	17 (2.7)	2 (1.3)	16 (3.0)	
Race (n = 643)				<0.01
African American/other minorities	456 (70.9)	66 (82.5)	370 (68.4)	
Caucasian	187 (29.1)	14 (17.5)	171 (31.6)	
Education (n = 643)				<0.01
≤High School degree/GED	333 (51.8)	57 (70.3)	261 (47.9)	
>High School degree	310 (48.2)	23 (28.7)	280 (52.1)	
Employment (n = 621)				<0.01
Unemployed	330 (53.1)	62 (78.5)	255 (48.9)	
Employed	291 (46.9)	17 (21.5)	267 (51.2)	
Income (n = 608)				<0.01
<$10,000	319 (52.5)	20 (27.0)	292 (56.6)	
≥$10,000	289 (47.5)	54 (73.0)	224 (43.4)	
Current ART prescription	620 (96.4)	78 (97.5)	521 (96.3)	0.59
CD4 cell count (n = 623)				0.17
<200 cells/mm^3	73 (11.7)	13 (16.9)	60(11.5)	
≥200 cells/mm^3	550 (88.3)	64 (83.1)	464 (88.6)	
HIV RNA viral loads (n = 625)				<0.01
<200 copies/mL	446 (71.4)	46 (56.8)	384 (70.5)	
≥200 copies/mL	179 (28.6)	32 (39.5)	141 (25.9)	
Depressive symptomology[b]	509 (81.3)	81 (100.0)	0 (0.0)	<0.01
Anxiety symptomology[c]	335 (53.5)	75 (92.6)	260 (47.7)	<0.01
Homelessness	82 (12.7)	30 (37.0)	49 (9.0)	<0.01
Average alcohol consumption ≥8 drinks, per week	167 (25.8)	23 (14.1)	140 (85.9)	0.60
No sexual activity in the past 3 months	245 (37.8)	39 (48.2)	199 (36.5)	0.11

[a] p value < 0.05

[b] PHQ-9 ≥ 10 score is considered as diagnosed depressive symptomology

[c] GAD-7 ≥ 10 score is considered as diagnosed anxiety symptomology

Table 2 Risk factors associated among patients with suicidal ideation and those without

Predictors	cOR (95% CI)	aOR[c] (95% CI)	aOR (95% CI)
Gender			
Female	Ref	Ref	Ref
Male	0.90 (0.79, 1.02)	1.01 (0.86, 1.18)	0.93 (0.81, 1.05)[d]
Transgender	–	–	–
Age			
18–24	Ref	Ref	Ref
25–44	0.91 (0.75, 1.12)	0.89 (0.70, 1.14)	0.93 (0.75, 1.16)[d]
45–64	–	–	–
65+	–	–	–
Race			
African American/other minorities	1.22 (1.05, 1.41)	1.08 (0.88, 1.32)	1.14 (0.97, 1.34)[d]
Caucasian	Ref	Ref	Ref
Education			
≤High school degree/GED	1.28 (1.12, 1.45)	1.10 (0.94, 1.28)	**1.21 (1.06, 1.39)**[e]
>High school degree	Ref	Ref	Ref
Employment			
Unemployed	1.40 (1.21, 1.62)	1.15 (0.96, 1.38)	**1.34 (1.15, 1.56)**[f]
Employed	Ref	Ref	Ref
Income			
<$10,000	1.37 (1.20, 1.57)	1.07 (0.89, 1.28)	1.18 (0.99, 1.38)[d]
≥$10,000	Ref	Ref	Ref
Current ART prescription	0.99 (0.80, 1.22)	0.98 (0.75, 1.31)	0.95 (0.77, 1.19)[d]
CD4 cell count			
<200 cells/mm^3	1.12 (0.95, 1.32)	1.03 (0.84, 1.26)	1.09 (0.92, 1.29)[d]
≥200 cells/mm^3	Ref	Ref	Ref
HIV RNA viral loads			
<200 copies/mL	Ref	Ref	Ref
≥200 copies/mL	1.17 (1.04, 1.33)	1.00 (0.86, 1.15)	**1.14 (1.01, 1.30)**[d]
Depressive symptomology[a]	–	–	–
Anxiety symptomology[b]	1.26 (1.19, 1.34)	**1.55 (1.22, 1.97)**	**1.79 (1.45, 2.22)**[d]
Homelessness	4.07 (2.77, 5.98)	**1.31 (1.11, 1.54)**	**1.45 (1.25, 1.67)**[d]
Average alcohol consumption ≥8 drinks, per week	1.15 (0.69, 1.91)	1.02 (0.84, 1.23)	1.03 (0.87, 1.20)[d]
No sexual activity in the past 3 months	1.13 (1.00, 1.27)	1.15 (0.99, 1.32)	1.12 (0.99, 1.26)[d]

[a] PHQ-9 ≥ 10 score is considered as diagnosed depressive symptomology

[b] GAD-7 ≥ 10 score is considered as diagnosed anxiety symptomology

[c] All statistically significant bivariate correlations entered into the regression model: race, education, employment, income, homelessness, HIV RNA viral loads, depressive and anxiety symptomology

[d] Final regression model adjusted by confounding variables: employment, education

[e] Final regression model adjusted by confounding variables: employment

[f] Final regression model adjusted by confounding variables: education

male, 96% (n = 620) had a current prescription for ART, over half (n = 330) were unemployed, a little more than 12% (n = 82) were homeless and nearly 38% (n = 245) of the sample stated not having had a sexual partner in the past 3 months (Table 1). Approximately 81% (n = 509) and 54% (n = 335) had depressive and anxiety symptomology, respectively. Of the total sample size, 13% (n = 81) reported any level of suicidal ideation in the previous two weeks.

Sociodemographic factors associated with suicidal ideation included being African American or other minorities ($X^2 = 7.3$, df = 1, $p < 0.01$), achieving less than a high school degree/GED ($X^2 = 16.7$, df = 1, $p < 0.01$), being unemployed ($X^2 = 22.1$, df = 1, $p < 0.01$), reporting an

annual income of <$10,000 ($X^2 = 18.7$, df = 1, $p < 0.01$), and those who considered themselves homeless ($X^2 = 50.3$, df = 1, $p < 0.01$). Biomedical and psychological factors significantly associated with suicidal ideation were moderate to severe anxiety symptomology ($X^2 = 57.1$, df = 1, $p < 0.01$), presence of moderate to severe depressive symptomology ($X^2 = 21.4$, df = 1, $p < 0.01$) and unsuppressed viral load ($X^2 = 6.7$, df = 1, $p < 0.01$) (Table 1). After adjusting for all statistically significant bivariate correlates, homeless individuals had 1.31 higher odds of reporting suicidality [adjusted odds ratio (aOR) 1.31; 95% confidence interval (CI) 1.11–1.54] and those with moderate to severe anxiety had 1.55 higher odds of reporting suicidality (aOR 1.55; 95% CI 1.22–1.97)(Table 2). Specifically, final regression models which controlled for employment and educational attainment, due to the confounding effect between exposure and outcome, demonstrated homeless individuals had 1.45 times higher odds of reporting suicidality (aOR 1.45; 95% CI 1.25–1.67) and those endorsing anxiety also had 1.79 times higher odds (aOR 1.79; 95% CI 1.45–2.22) of reporting suicidality. Additionally, our analysis also noted individuals with unsuppressed viral loads were 1.14 times higher odds of reporting suicidality than those who were virally suppressed (aOR 1.14; 95% CI 1.01–1.30), those who were unemployed had 1.34 higher odds (aOR 1.31; 95% CI 1.15–1.56), and those who had lower educational attainment with and 1.21 times higher odds of reporting suicidality (aOR 1.21; 95% CI 1.06–1.39), respectively (Table 2).

Discussion

This study found a significant portion of this HIV patient population expressed current suicidal thoughts. We identified that those who experienced suicidality had attained lower levels of education, less likely to be employed, more likely to be homeless, express more moderate to severe depressive and anxiety symptomology, and have unsuppressed viral loads. This study illustrates that despite HIV medical treatment and care advancements, there continues to be a high rates of psychological distress among PLWHA. We hypothesized in this study that individuals who had suppressed viral loads were less likely to express suicidal ideation, which was evident. With significant proportions of PLWHA with unsuppressed viral loads, effective interventions need to better address continued and diverse mental health challenges.

Previous studies found both that PLWHA more commonly report psychological distress, and those with psychiatric disorders were more likely to express suicidal ideation. Our study identified similar patterns of HIV management and moderate to severe symptoms of anxiety, even among those engaged in HIV care [17, 18]. We expected that managing HIV infection well (by adhering to medication and achieving viral suppression) would be more common among those who do not express suicidal ideation. We anticipated that when severe psychological distress occurs it is more likely that HIV management is more complicated for the individual, as previously explored [19]. Previous studies have identified high rates of distress interrupts medication adherence, [20, 21] thus this study sought to examine if those relationships were evident in relation to suicidal ideation. While we were not able to study populations not receiving medical care, we would expect a higher rate of suicidality among populations without access to HIV care. This study brings to the forefront that severe mental health issues persist among PLWHA, even in the context of medical advancements. HIV infection persists as a disease that is associated with socioeconomic, structural challenges, and comorbid medical conditions that are not being responded to in the context of clinic appointments. Yet, for many health care and social service settings, there are limited resources (i.e. due to local and state budget cuts), which pose additional challenges to providers in being able to offer a stable provision of mental healthcare for PLWHA [22, 23]. Managing HIV infection continues to be a complex disease to manage in addressing psychological well-being in this population [24, 25].

Conclusions

Given the nature of our study, these measures of psychological distress are screening tools and are intended to be more sensitive to symptoms. We were limited to one question about suicidality, although endorsing that symptom signifies an important concern. These results are not able to provide a causal relationship between suicidality and other factors such as, sexual activity and alcohol consumption; thus, to make such claims would be appropriate for a prospective study. Despite these limitations, our study was able to survey and analyze a prevalence and severity of suicidality in an outpatient HIV clinic population who were steadily receiving ART medications. These findings highlight and stress the importance of advancing research to understand casual implications and furthering intervention strategies for suicidality among individuals diagnosed with HIV.

Compliance with Ethical Standards

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or National Research Committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was waived from all individual participants included in the study, due to the psychological assessments being standard of care within the clinic setting.

References

1. Holtzman CW, Brady KA, Yehia BR. Retention in care and medication adherence: current challenges to antiretroviral therapy success. Drugs. 2015;75(5):445–54.
2. Prigerson HG, Desai RA, Liu-Mares W, Rosenheck RA. Suicidal ideation and suicide attempts in homeless mentally ill persons: age-specific risks of substance abuse. Soc Psychiatry Psychiatr Epidemiol. 2003;38(4):213–9.
3. King M, Semlyen J, Tai SS, Killaspy H, Osborn D, Popelyuk D, et al. A systematic review of mental disorder, suicide, and deliberate self harm in lesbian, gay and bisexual people. BMC Psychiatry. 2008;8(1):70.
4. Carrico AW. Elevated suicide rate among HIV-positive persons despite benefits of antiretroviral therapy: implications for a stress and coping model of suicide. Am J Psychiatry. 2010;167(2):117–9.
5. Waite KR, Paasche-Orlow M, Rintamaki LS, Davis TC, Wolf MS. Literacy, social stigma, and HIV medication adherence. J Gen Intern Med. 2008;23(9):1367–72.
6. 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 (1999). J Acquir Immune Defic Syndr. 2011;56(2):146–50.
7. Serafini G, Montebovi F, Lamis DA, Erbuto D, Girardi P, Amore M, et al. Associations among depression, suicidal behavior, and quality of life in patients with human immunodeficiency virus. World J Virol. 2015;4(3):303–12.
8. Cooperman NA, Simoni JM. Suicidal ideation and attempted suicide among women living with HIV/AIDS. J Behav Med. 2005;28(2):149–56.
9. Kelly B, Raphael B, Judd F, Perdices M, Kernutt G, Burnett P, et al. Suicidal ideation, suicide attempts, and HIV infection. Psychosomatics. 1998;39(5):405–15.
10. Wagner GJ, Goggin K, Remien RH, Rosen MI, Simoni J, Bangsberg DR, et al. A closer look at depression and its relationship to HIV antiretroviral adherence. Ann Behav Med. 2011;42(3):352–60.
11. Prevention CfDCa. HIV Surveillance Supplemental Report. 2015; 20(3).
12. Turner BJ, Fleishman JA, Wenger N, London AS, Burnam MA, Shapiro MF, et al. Effects of drug abuse and mental disorders on use and type of antiretroviral therapy in HIV-infected persons. J Gen Intern Med. 2001;16(9):625–33.
13. Catz SL, Kelly JA, Bogart LM, Benotsch EG, McAuliffe TL. Patterns, correlates, and barriers to medication adherence among persons prescribed new treatments for HIV disease. Health Psychol. 2000;19(2):124.
14. Kroenke K, Spitzer RL, Williams J. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001;16:606–13.
15. Lowe B, Decker O, Muller S, Brahler E, Schellberg D, Herzog W, et al. Validation and standardization of the Generalized Anxiety Disorder Screener (GAD-7) in the general population. Med Care. 2008;46(3):266–74.
16. Stahre M, Naimi T, Brewer R, Holt J. Measuring average alcohol consumption: the impact of including binge drinks in quantity-frequency calculations. Addiction. 2006;101(12):1711–8 **(Abingdon, England)**.
17. Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, et al. Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010. Lancet. 2013;382(9904):1575–86.
18. Schadé A, van Grootheest G, Smit JH. HIV-infected mental health patients: characteristics and comparison with HIV-infected patients from the general population and non-infected mental health patients. Bmc Psychiatry. 2013;13(1):1.
19. Gurung RAR, Taylor SE, Kemeny M, Myers H. HIV is not my biggest problem: the impact of HIV and chronic burden on depression in women at risk for AIDS. J Soc Clin Psychol. 2004;23(4):490.
20. Shacham E, Morgan J, Önen N, Taniguchi T, Overton E. Screening anxiety in the HIV clinic. AIDS Behav. 2012;16(8):2407–13.
21. Shacham E, Nurutdinova D, Satyanarayana V, Stamm K, Overton ET. Routine screening for depression: identifying a challenge for successful HIV care. AIDS Patient Care STDs. 2009;23(11):949–55.
22. Diez Roux AV. Investigating neighborhood and area effects on health. Am J Public Health. 2001;91(11):1783–9.
23. Levy ME, Wilton L, Phillips G 2nd, Glick SN, Kuo I, Brewer RA, et al. Understanding structural barriers to accessing HIV testing and prevention services among black men who have sex with men (BMSM) in the United States. AIDS Behav. 2014;18(5):972–96.
24. Asch SM, Kilbourne AM, Gifford AL, Burnam MA, Turner B, Shapiro MF, et al. Underdiagnosis of depression in HIV: who are we missing? J Gen Intern Med. 2003;18(6):450–60.
25. Israelski DM, Prentiss DE, Lubega S, Balmas G, Garcia P, Muhammad M, et al. Psychiatric co-morbidity in vulnerable populations receiving primary care for HIV/AIDS. AIDS Care. 2007;19(2):220–5.