



Published in final edited form as:

AIDS Behav. 2010 April ; 14(2): 300–307. doi:10.1007/s10461-008-9443-8.

HIV-Infected Prison Inmates: Depression and Implications for Release Back to Communities

Anna Scheyett¹, Sharon Parker¹, Carol Golin², Becky White³, Carrie Pettus Davis¹, and David Wohl³

¹School of Social Work, University of North Carolina at Chapel Hill, Chapel Hill, NC

²School of :Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC

³School of Medicine, University of North Carolina at Chapel Hill, Chapel Hill, NC

Abstract

High rates of both HIV and depression are seen in prison populations; depression has been linked to disease progression in HIV, risky behaviors, and medication non-adherence. Despite this, few studies have examined HIV-infected inmates with depression. We therefore conducted an exploratory study of a sample of HIV-infected inmates in North Carolina prisons (N=101) to determine what proportion of this sample screened positive for depression and whether depression was associated with different pre-incarceration characteristics or post-release needs. A high proportion of HIV infected inmates (44.5%) screened positive for depression. Depressed inmates were significantly more likely have low coping self-efficacy scores (180 vs. 214), to report having had resource needs (OR=2.91) prior to incarceration and to anticipate needing income (OR=2.81), housing (OR=4.07), transportation (OR=9.15), and assistance with adherence (OR=8.67) post-release. We conclude by discussion the implications of our findings for prison based care and effective prison release planning for HIV infected inmates.

Keywords

HIV; AIDS; prison; depression; reentry; coping self-efficacy

INTRODUCTION

HIV infection is at the nexus of several health and social problems in the United States, including substance abuse, mental illnesses, racial health disparities, and incarceration. HIV-infected individuals are disproportionately in prison, have high rates of substance abuse and mental illnesses, and are disproportionately members of minority groups (Bing et al., 2001; Centers for Disease Control and Prevention (CDC), 2007; Hammet, Harmon, and Rhodes, 2002). This study examined the intersection of HIV infection and mental illness, specifically depression, among incarcerated persons.

Research has shown that 20 % to 25 % of all people living with HIV in the United States pass through a correctional facility in a year (Hammet et al., 2002). An estimated 1.8% of the United States prison population was HIV infected in 2005, a proportion that is four to five times higher than that seen in the general population (CDC, 2007; Maruschak, 2007). Reasons for this higher prevalence are multiple, and include high prevalence of injection drug use and risky sexual

behavior such as sex work, both of which may lead to arrest and offer routes of HIV transmission (Hammet et al., 2002; Krebs, 2002; Stephenson et al., 2006). Other reasons for higher HIV rates in corrections can be conceptualized using a social determinants of health frame (Marmot & Wilkinson, 1999). Contextual social factors such as lack of access to employment, education, and health and behavioral healthcare; discrimination; and socially unjust policies such as the “war on drugs”, all disproportionately affect African Americans, all are predictors of incarceration, and all elevate risk for HIV (Doherty, Leone & Aral, 2007; Farley, 2006). Higher rates of both HIV and of incarceration in African-American men thus contribute to high rates of HIV in incarcerated populations (Bureau of Justice Statistics, 2007; CDC, 2007). Incarcerated individuals also experience high rates of mental illnesses (Brink, 2005; Theriot and Segal, 2005). Estimated rates of mental illnesses range from 6% to 16% (Ditton, 1999; Steadman, Fabisiak, Dvoskin, and Holohean, 1989; Teplin, 1990). A recent report indicates that an estimated 56 % of state prison inmates had symptoms or recent history of a mental health problem; 47 % of these reported three or more symptoms of major depression, compared with 7.9 % of the general population of the U.S. (James and Glaze, 2006; U.S. Department of Health and Human Services, 2002).

HIV-infected individuals have also been shown to have higher rates of mental illnesses than the general population. Nearly half of a nationally representative cohort of HIV-infected individuals receiving medical care screened positive for a psychiatric disorder; 36 % screened positive for depression (Bing et al., 2001). A meta-analysis of studies examining the relationship between HIV infection and depression found the frequency of depression was nearly two times higher in HIV-infected individuals (Ciesla and Roberts, 2001).

For individuals who are HIV-infected, both incarceration and depression are linked with behaviors that may increase the risk of HIV disease progression and transmission. Studies have found that 26 % of HIV-infected inmates reported unprotected sexual activity within 45 days after release (Stephenson et al., 2006). Forty percent of HIV-infected prison releasees had not accessed medical care by six weeks post-release (Harzke, Ross, and Scott, 2006) and decreased CD4 lymphocyte counts and increased plasma HIV RNA levels are common in releasees (Spring, et al., 2004; Stephenson et al., 2005). Depression has been linked to disease progression in HIV-infected individuals, probably through multiple mechanisms, including poor medication adherence and risky sexual behaviors, however depressive symptoms have been found to be linked to disease progression even after controlling for medication adherence and clinical and demographic factors (Boarts, Sledjeski, Bogart, and Delahanty, 2006; Evans et al., 2002; Ickovics et al., 2001; Lima et al., 2007; Olatunji, Mimiaga, O’Cleirigh, and Safren, 2006; Perdue, Hagan, Thiede, and Valleroy, 2003; Reynolds et al., 2004; Vanable, Carey, Blair, and Littlewood, 2006).

Given the complicated picture seen in the overlap of HIV, incarceration, and depression, it is important to understand the characteristics and needs of HIV-infected incarcerated individuals with depression. However, few studies have examined depression among HIV-infected persons being released from prison and their post-release needs (see, for example Baillargeon et al., 2003). To expand our understanding of this high risk and vulnerable population, we conducted an exploratory examination of HIV-infected inmates in the North Carolina prison system. Our research questions were threefold: a) what proportion of a soon-to-be released HIV-infected prison sample screens positive for depression, and of these, what proportion are identified as depressed; b) do depressed and non-depressed HIV-infected inmates differ with regard to characteristics such as demographics, medical history, or prison history; and c) is depression a significant predictor of coping self-efficacy, pre-incarceration needs or anticipated post-release needs in this HIV-infected prison sample. Findings may have great relevance for effective prison release planning and successful community reintegration for HIV-infected individuals.

METHODS

Participants and Procedures

This study examined baseline data from a longitudinal randomized trial of a strengths-model case management intervention for HIV-infected prison releasees. Participants (N=101) were recruited from the Infectious Diseases clinics in the North Carolina state prison system. Inmates were initially approached by a research assistant or clinic staff and given a description of the study; those who were interested then met with a research assistant to receive more information, and if they remained interested, to be consented into the study. Participants were included if they were 18 years of age or older, HIV-infected, English-speaking, within 3 months of release, able to give consent, and returning to one of three study site regions in the state. Participants received baseline interviews from a trained research assistant in a private room in the prison. Research assistants also extracted data from participants' medical charts at the Infectious Diseases clinic. All study procedures were approved by the University of North Carolina School of Medicine IRB and the Human Subjects Review Committee of the North Carolina Department of Corrections.

Measures

Demographic data, prison history, current health status, and medical history were abstracted from participants' administrative and medical charts. We reviewed participants' medical records for mental health diagnoses and psychotropic medications. Participants were considered to have identified depression if they: 1) had a diagnosis of depression in their medical chart; 2) received a psychotropic medication; or 3) responded affirmatively when asked "has a doctor ever told you that you have bipolar disorder, manic depression, or major depression?".

Participants' pre-incarceration characteristics and anticipated post-release needs were obtained through a structured interview using study-developed yes/no questions. These questions asked if *in the six months prior to incarceration* the participant: 1) had been employed, 2) had to choose between getting basic needs (food, clothing, shelter) and medical care, 3) had needed help with income, health benefits, or housing, and 4) had abused substances (defined as either binge drinking five or more drinks in a sitting, drinking daily, or using any drug in a manner not prescribed by a physician). Anticipated *post-release needs* were identified by asking participants if *upon release* they thought they would need help with income, health benefits, housing, employment, transportation to appointments, access to medications, medication adherence, finding a doctor, or adjusting to the "outside".

Two standardized instruments were used in this study. The Center for Epidemiological Studies-Depression Scale (CES-D) was used to screen for depression. This is a 20 item, likert-type scale to rate depressive symptomatology over the past week. It has been shown previously to be valid and reliable in a broad ranged of settings (Roberts, 1980), with a Cronbach's alpha of 0.89 for this study, and used with other HIV-infected samples (Boarts et al., 2006; Vanable et al., 2006). A cutoff score of 17 is used in the literature as a predictor of depression (Boarts et al., 2006). However, to prevent confounding of depressive symptoms and HIV symptoms, questions addressing somatic symptoms were removed from the scale, and the cutoff score prorated to 12 and above. Coping self-efficacy was measured using the standardized Coping Self-Efficacy Scale, a 26 item scale with responses from 0 to 10 for each item. This instrument has been shown to have good validity and reliability (Chesney, Neilands, Chambers, Taylor, and Folkman, 2006), with a Cronbach's alpha of 0.94 for this study.

Data Analyses

Descriptive statistical analyses were completed to fully describe the sample. Bivariate analyses comparing depressed ($\text{CES-D} \geq 12$) and non-depressed participants used chi square tests for categorical variables, and, since none of the continuous variables were normally distributed, the nonparametric Wilcoxon rank-sum test statistic was used for continuous variables. All analyses were two-tailed, with significance set at $p \leq 0.05$.

Multivariate logistic regression analyses were conducted to determine whether depression was a significant predictor of those pre-incarceration and post-release needs where bivariate analyses revealed significant differences between depressed and non-depressed groups. Covariates introduced into the multivariate model were age, race, gender, pre-incarceration employment status, and marital status. Coping Self-Efficacy scores were not normally distributed, therefore the variable was dichotomized at the median of 207 to better capture possible non-linear associations prior to multivariate analysis. Then multivariate logistic regression analysis was completed to determine whether depression was a significant predictor of coping self-efficacy. When multivariate logistic regression indicated depression was a significant predictor of need, the Coping Self-Efficacy score was added to the model to examine possible mediating effects. All analyses were completed using the statistical package SAS 9.1 (SAS Institute, 2002).

RESULTS

Participant characteristics

There were 101 participants in the sample. Sample characteristics are summarized in Table I. Participants were predominantly Black (80.1%) and male (72.3%) with a mean age of 39.6 years. Few participants were married (12.9%), less than half (44.6%) had been working in the six months prior to incarceration, and slightly more than half (57.4%) had completed a GED or higher level of education. On average participants had spent 26.4 months in prison and had 3.5 incarcerations.

Nearly three quarters (73.3%) of participants had a CD4 lymphocyte count above 200 lymphocytes/ μl and almost 40% had an undetectable plasma HIV viral load at their most recent clinic visit. The majority of participants (66.3%) were receiving HAART. On average participants had known their HIV status for 8.1 years, with a minority (22.1%) receiving their diagnosis during their current incarceration. Nearly all (90.1%) participants reported substance abuse in the six months prior to incarceration.

A number of both pre-incarceration needs and anticipated post-release needs were identified by participant self-report during the study interview. These included pre-incarceration needs for help with income (63.4%), health benefits (57.4%) and housing (43.6%), and a report that pre-incarceration 36.7% had to choose between meeting basic needs and obtaining healthcare. Anticipated post-release needs most commonly identified were help with health benefits (95.0%), accessing medication (82.2%), income (80.1%), transportation to appointments (68.3%), housing (66.3%), employment (62.4%), and finding a physician (56.4%). Participants indicated relatively low confidence in their ability to cope with life challenges, with an average score on the Coping Self-Efficacy scale of 199.2 (range 140–242) on a 260-point scale.

Rates of screening positive for depression

As can be seen in Table II, when examining CES-D scores we found the average score was 11.71 ($\text{SD} = 11.81$) and that 45 participants (44.5%) scored 12 or higher on this screening instrument, indicating clinically significant depression in these participants. We compared the CES-D results with the number of participants who were identified as depressed, and found

that 22 of these participants (49.0% of those screening positive, or 21.8% of the entire sample) were not identified as depressed through history, diagnosis, medication prescription or self-report.

Comparison of depressed and non-depressed participants

In bivariate analyses, participants screening positive for depression differed significantly from non-depressed participants in several ways (see Table III). Significantly fewer depressed participants had completed a GED or higher level of education (46.7% versus 66.1%, $p < 0.05$), or had received their HIV diagnosis during their current incarceration (15.6% versus 33.3%, $p < 0.05$). Depressed participants scored significantly lower on the Coping Self Efficacy scale (179.7 vs. 214.4, $p < 0.001$).

When discussing pre-incarceration needs, significantly more depressed participants reported having to choose between meeting basic needs and obtaining healthcare (51.1% vs. 25.0%, $p < 0.01$) and needing help with housing (55.6% vs. 35.2%, $p < 0.05$). When considering post-release needs, significantly more depressed participants reported needing help with income (91.1% vs. 75.5%, $p < 0.05$), housing (84.4% vs. 53.7%, $p < 0.05$), transportation to appointments (91.1% vs. 50.9%, $p < 0.001$), and adherence to medications (37.8% vs. 7.4%, $p < 0.001$).

Multivariate logistic regression analyses were completed to examine whether depression was a significant predictor of Coping Self-Efficacy and identified needs. In all analyses covariates included age, race, gender, employment pre-incarceration, and marital status, variables thought to be most relevant to community-based needs. Results of these analyses are summarized in Table IV. Depressed participants were significantly less likely to have a Coping Self Efficacy score above the median (OR=0.22, $p < 0.001$), and more likely to report having to choose between meeting basic needs and healthcare (OR=2.91, $p < 0.05$), needing help with transportation to appointment post-release (OR=9.15, $p < 0.001$), and needing help with medication adherence post-release (OR=8.67, $p < 0.001$). In addition, depressed participants trended toward being more likely (OR 2.81, $p < 0.10$) to report needing help with income post-incarceration. For all of these outcome variables no other covariate tested was found to be significant. Depressed participants were significantly more likely (OR=4.07, $p < 0.01$) and married participants significantly less likely (OR 0.25, $p < 0.05$) to report anticipating needing help with housing post-release. Depression was not shown to be a significant predictor variable for needing help with housing pre-incarceration.

Given the significant relationship between depression and Coping Self-Efficacy scores, and the clinical logic of depressed individuals having less ability to cope with life challenges, we examined Coping Self-Efficacy scores as mediators of the relationship between depression and need for each need where depression was a significant predictor variable. As can be seen in Table V, Coping Self-Efficacy score was a strong mediator of the relationship between depression and competing basic needs and healthcare, and a weak mediator of the relationship between depression and transportation need.

DISCUSSION

This study examined the proportion of soon to be released HIV-infected inmates screening positive for depression using the CES-D, and compared depressed vs. non-depressed inmates looking at Coping Self-Efficacy and possible differences in community-based needs pre-incarceration and post-release. Our study found that a high proportion (44.5%) of participants screened positive for depression; this rate is somewhat higher than that seen in the largest study of HIV-infected individuals in community-based treatment (36%) (Bing et al., 2001).

Participants screening positive for depression reported significantly different needs than those without depression. Pre-incarceration depressed participants were significantly more likely to have struggled to balance meeting their basic needs for food, shelter, and clothing with their need for medical care compared to those without depression. When considering their post-release needs, depressed participants were significantly more likely to believe they would need help with income, housing, transportation to appointments, and adherence to their medications.

Perhaps most importantly, depressed participants had lower coping self-efficacy, being significantly less likely to score above the median in the Coping Self-Efficacy scale. Thus, we find a group of particularly vulnerable soon-to-be released HIV-infected inmates—with fewer resources prior to coming to prison, more anticipated needs upon release, and, most seriously, with poorer ability to cope with these challenges. Our preliminary exploration suggests that the relationship between depression and struggles in meeting basic needs and healthcare needs, and the relationship between depression and needing transportation post-release may be mediated by coping self-efficacy; depression may reduce coping, which in turn decreases ability to juggle basic needs and healthcare or problem-solve ways to obtain transportation. The relationships among depression, coping self-efficacy and needs require additional research.

It was interesting to find that though nearly half of the sample screened positive for depression, only half of these depressed participants were identified as such. Given that screening instruments such as the CES-D may be more sensitive than specific, this many or may not be a significant finding, and warrants additional study. For example, examination of HIV-infected prison inmates using a more specific clinical instrument such as the Structured Clinical Interview for DSM-IV Axis I disorders (SCID-I), which is used to diagnose any and all Axis I disorders (First, Spitzer, Williams, et al., 1997), would help clarify actual rates of depression as well as other mental disorders in this population.

Especially with further study, these findings have implications for prison-based care and release planning of HIV-infected inmates. Management of depression and/or enhancing coping skills prior to release may be essential to successful linkage to community-based care. Since HIV-infected individuals with depression may have less income support and fewer housing options upon release, the process of identification of appropriate income sources and housing may need to begin earlier for depressed HIV-infected individuals than for typical release planning. Release planning for HIV-infected individuals should always include linkage to community-based medical care. However, our results suggest that for depressed individuals release planning may need to ensure that the inmate also has consistent and reliable transportation to get to appointments. Medication education is an essential part of HIV care (Bangsberg et al., 2002); our findings suggest that for HIV-infected inmates with depression release planning may need to go well beyond education and also include development of strategies for antiretroviral medication adherence and identification of support persons who can assist with medication adherence once the individual has returned to the community. Given the lower coping self-efficacy scores seen in depressed participants, release planning may need to be especially detailed and structured, and include strategies for coping and problem-solving when confronted with barriers to care.

Since this is an early, exploratory study, there are a number of study limitations. The study was limited to one state and additional geographic restriction were placed on sample selection due to a limited number of intervention sites, thus findings may not be generalizable. The sample size is small, limiting statistical power in analyses. No conclusions regarding causality can be drawn from these analyses; depression may lead to fewer resources upon release, or having fewer resources may lead to depression in prison. Finally, information on community-based need was obtained by inmate self-report. Inmates' recollection of need may vary from actual

community need prior to incarceration. In addition, inmates were asked to consider what they would need upon release, which could be very different than their actual needs once they have returned to the community.

Clearly additional research is needed in this area. Longitudinal studies examining actual needs and outcomes post-release, and data collection from other sources in addition to inmate self-report are needed. Longitudinal studies are also needed to determine if treatment of depression improves post-release outcomes. Finally, testing of differential release planning, tailored to the particular needs and vulnerabilities of HIV-infected inmates is needed.

In conclusion, in this exploratory study we found that a high proportion of HIV-infected inmates screened positive for depression. These depressed individuals were more likely to report fewer resources prior to incarceration, more needs upon release, and had lower coping self-efficacy to deal with these additional challenges. Screening and treatment for depression while in prison and differential release planning that considers the coping skills and particular needs of individuals with depression may increase the likelihood of successful connection with care in the community and maximize the chances for prolonged life and successful community reintegration in this vulnerable and challenged HIV-infected population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

This study was supported in part by the US National Institutes of Health, National Institute on Drug Abuse and by the University of North Carolina Center For AIDS Research.

References

- Baillargeon J, Ducate S, Pulvino J, Bradshaw P, Murray O, Olvera R. The association of psychiatric disorders and HIV infection in the correctional setting. *Annals of Epidemiology* 2003;13(9):606–612. [PubMed: 14732299]
- Bangsberg D, Hecht F, Clague H, Charlebois E, Ciccarone D, Chesney M, Moss A. Provider assessment of adherence to HIV antiretroviral therapy. *Journal of Acquired Immune Deficiency Syndromes* 2002;26:435–442. [PubMed: 11391162]
- Bing E, Burnam M, Longshore D, Fleischman J, Sherbourne C, London A, Turner B, Eggan F, Beckman R, Vitiello B, Morton S, Orlando M, Bozzette S, Ortiz-Barron L, Shapiro M. Psychiatric disorders and drug use among human immunodeficiency virus-infected adults in the United States. *Archives of General Psychiatry* 2001;58:721–728. [PubMed: 11483137]
- Boarts J, Sledjeski E, Bogart L, Delahanty D. The differential impact of PTSD and depression on HIV disease markers and adherence to HAART in people living with HIV. *AIDS and Behavior* 2006;10(3):253–261. [PubMed: 16482405]
- Brink J. Epidemiology of mental illness in a correctional system. *Current Opinion in Psychiatry* 2005;18:536–541. [PubMed: 16639114]
- Bureau of Justice Statistics. Criminal offender statistics. 2007 [Retrieved March 3, 2007]. from <http://www.ojp.usdoj.gov/bjs/crimoff.htm>
- CDC. Rockville, MD: U.S Department of Health and Human Services; 2007. HIV/AIDS surveillance report, 2005.
- Chesney M, Neilands T, Chambers D, Taylor J, Folkman S. A validity and reliability study of the coping self-efficacy scale. *British Journal of Health Psychology* 2006;11(3):421–437. [PubMed: 16870053]
- Ciesla J, Roberts J. Meta-analysis of the relationship between HIV infection and risk for depressive disorders. *American Journal of Psychiatry* 2001;158:725–730. [PubMed: 11329393]

- Ditton, P. Mental health treatment of inmates and probationers. Washington, D.C: Bureau of Justice Statistics; 1999. (No. 174463).
- Doherty I, Leone P, Aral S. Social determinants of HIV infection in the deep south. *American Journal of Public Health* 2007;97(3):391. [PubMed: 17267706]
- Evans D, Ten Have T, Douglas S, Morrison G, Chiappini M, Brinker-Spence P, Job C, Mercer D, Wang Y, Cruess D, Dube B, Dalen E, Brown T, Bauer R, Petittio J. Association of depression with viral load, CD8 T lymphocytes, and natural killer cells in women with HIV infection. *American Journal of Psychiatry* 2002;159:1752–1759. [PubMed: 12359683]
- Farley T. Sexually transmitted diseases in the Southeastern United States: Location, race, and social context. *Sexually Transmitted Diseases* 2006;33(7):S58–S64. [PubMed: 16432486]
- First, M.; Spitzer, R.; Williams, J., et al. Washington, D.C: American Psychiatric Press; 1997. Structured clinical interview for DSM-IV-clinician version (SCID-CV) (User's guide and interviews).
- Hammet T, Harmon M, Rhodes W. The burden of infectious disease among inmates of and releasees from US correctional facilities, 1997. *American Journal of Public Health* 2002;92(11):789–794.
- Harzke A, Ross M, Scott D. Predictors of post-release primary care utilization among HIV-positive prison inmates: A pilot study. *AIDS Care* 2006;18(4):290–301. [PubMed: 16809106]
- Ickovics J, Hamburger M, Vlahov D, Schoenbaum E, Schumann P, Boland R, Moore J. Mortality, CD4 cell count decline, and depressive symptoms among HIV-seropositive women. *Journal of the American Medical Association* 2001;285(11):1466–1474. [PubMed: 11255423]
- James, D.; Glaze, L. U.S. Department of Justice, Bureau of Justice Statistics; 2006. Mental health problems of prison and jail inmates. p. 12
- Krebs C. High risk HIV transmission behavior in prison and the prison subculture. *Prison Journal* 2002;82:19–49.
- Lima V, Geller J, Bangsberg D, Patterson T, Daniel M, Kerr T, Montaner J, Hogg R. The effect of adherence on the association between depressive symptoms and mortality among HIV-infected individuals first initiating HAART. *AIDS* 2007;21:1175–1183. [PubMed: 17502728]
- Marmot, M.; Wilkinson, R. Social determinants of health. New York: Oxford University Press; 1999.
- Maruschak, L. U.S. Department of Justice Bureau of Justice Statistics; 2007. HIV in Prisons, 2005.
- Olatunji B, Mimiaga M, O'Cleirigh C, Safren S. A review of treatment studies of depression and HIV. *Topics in HIV Medicine* 2006;14(3):112–124. [PubMed: 16946456]
- Perdue T, Hagan H, Thiede H, Valleroy T. Depression and HIV risk behaviors among Seattle-area injection drug users and young men who have sex with men. *AIDS Education and Prevention* 2003;15:81–93. [PubMed: 12627745]
- Reynolds N, Testa M, Marc L, Chesney M, Neidig J, Smith S, Vella S, Robbins G. Factors influencing medication adherence beliefs and self-efficacy in persons naive to antiretroviral therapy: A multi-center, cross-sectional study. *AIDS and Behavior* 2004;8(2):141–150. [PubMed: 15187476]
- Roberts R. Reliability of the CES-D in different ethnic contexts. *Psychiatry Research* 1980;2:125–134. [PubMed: 6932058]
- SAS Institute. Cary, NC: 2002. SAS for Windows (Version 9.1).
- Springer S, Pesanti E, Hodges J, Macura T, Doros G, Altice F. Effectiveness of antiretroviral therapy among HIV-infected prisoners: Reincarceration and the lack of sustained benefit after release to the community. *HIV/AIDS* 2004;3828:1754–1760.
- Steadman H, Fabisiak S, Dvoskin J, Holohean E. A survey of mental disability among state prison inmates. *Hospital and Community Psychiatry* 1989;38(10):1086–1090. [PubMed: 3666699]
- Stephenson B, Wohl D, Golin C, Tien H, Stewart P, Kaplan A. Effect of release from prison and reincarceration on the viral loads of HIV-infected inmates. *Public Health Reports* 2005;120:84–88. [PubMed: 15736336]
- Stephenson B, Wohl D, McKaig R, Golin C, Shain L, Adamian M, Emrick C, Strauss R, Fogel C, Kaplan A. Sexual behaviours of HIV-seropositive men and women following release from prison. *International Journal of STD and AIDS* 2006;17:103–108. [PubMed: 16464271]
- Teplin L. The prevalence of severe mental disorder among male urban jail detainees: Comparison with the Epidemiologic Catchment Area Program. *American Journal of Public Health* 1990;80(6):663–669. [PubMed: 2343947]

- Theriot M, Segal S. Involvement with the criminal justice system among new clients at outpatient mental health agencies. *Psychiatric Services* 2005;56:179–185. [PubMed: 15703345]
- U.S. Department of Health and Human Services. Bethesda, MD: National Institutes of Health, National Institute of Alcohol Abuse and Alcoholism; 2002. National epidemiologic survey on alcohol and related conditions.
- Vanable P, Carey M, Blair D, Littlewood R. Impact of HIV-related stigma on health behaviors and psychological adjustment among HIV-positive men and women. *AIDS and Behavior* 2006;10(5): 473–482. [PubMed: 16604295]

Table I

Characteristics of total sample (N=101)

	Total Sample N=101	
	n (%)	Mean (SD)
<i>Demographics</i>		
Age		39.6 (8.08)
Black	81 (80.1)	
Male	73 (72.3)	
Married	13 (12.9)	
Employed pre-prison	45 (44.6)	
GED or higher	58 (57.4)	
Months in prison		26.4 (43.04)
Times in prison		3.5 (2.72)
<i>Health</i>		
CD4 above 200	74 (73.3)	
Viral load undetectable	40 (39.6)	
On ART	67 (66.3)	
Years HIV+		8.1 (6.53)
HIV+ test this incarceration	22 (21.8)	
SA prior to prison	91 (90.1)	
<i>Needs</i>		
Competing basic needs and healthcare	37 (36.7)	
Pre-prison needs:		
Income	64 (63.4)	
Health benefits	58 (57.4)	
Housing	44 (43.6)	
Anticipated post-prison needs:		
Income	81 (80.1)	
Health benefits	96 (95.0)	
Housing	67 (66.3)	
Employment	63 (62.4)	
Transportation	69 (68.3)	
Medication access	83 (82.2)	
Adherence help	21 (20.8)	
Finding a MD	57 (56.4)	
Adjust to "outside"	34 (33.7)	
Coping Self-Efficacy		199.2(47.49)

Table II

CES-D score results for total sample (N=101)

	n (%)	Mean (SD)
CES-D score		11.71 (11.81)
CES-D \geq 12	45 (44.5)	
CES-D \geq 12 but participant not identified as depressed	22 (21.8)	

Table III

Comparison of non-depressed and depressed subgroups (N=101)

	Not Depressed (CES-D < 12) n=56		Depressed (CES-D ≥ 12) n=45		X ²	Wilcoxon
	n (%)	Mean (SD)	n (%)	Mean (SD)		
<i>Demographics</i>						
Age		40.6 (8.31)		38.4 (7.732)		2079.0
Black	47 (83.9)		34 (75.6)		1.101	
Male	44 (78.5)		29 (64.4)		3.679	
Married	9 (16.7)		4 (8.9)		1.302	
Employed pre-prison	27 (50.9)		18 (40.0)		1.174	
GED or higher	37 (66.1)		21 (46.7)		3.843*	
Length of prison stay (months)		28.5 (47.69)		23.4 (36.91)		1920.0
Times in prison		3.3 (2.44)		3.7 (3.02)		2316.0
<i>Health</i>						
CD4 above 200	42 (79.3)		32 (71.1)		0.871	
Viral load undetectable	19 (35.2)		21 (48.8)		1.841	
On ART	34 (65.4)		33 (73.3)		0.714	
Years HIV+		7.8 (7.00)		8.5 (6.02)		2299.5
HIV+ test this incarceration	18 (33.3)		7 (15.6)		4.110*	
SA prior to prison	50 (89.2)		41 (91.1)		0.093	
Coping Self-Efficacy		214.4(44.04)		179.7 (45.01)		1500.0***
<i>Needs</i>						
Basic needs or care	14 (25.0)		23 (51.1)		7.328**	
Pre-prison needs:						
Income	31 (56.4)		33 (75.0)		3.715	
Health benefits	31 (59.6)		27 (69.2)		0.892	
Housing	19 (35.2)		25 (55.6)		4.125*	

	Not Depressed (CES-D < 12) n=56		Depressed (CES-D ≥ 12) n=45		X ²	Wilcoxon
	n (%)	Mean (SD)	n (%)	Mean (SD)		
Post-prison needs:						
Income	40 (75.5)		41 (91.1)		4.152*	
Health benefits	53 (96.4)		43 (95.6)		0.042	
Housing	29 (53.7)		38 (84.4)		10.603**	
Employment	30 (55.6)		33 (73.3)		3.352	
Transportation	28 (50.9)		41 (91.1)		18.701***	
Medication access	44 (80.0)		39 (86.7)		0.780	
Adherence help	4 (7.4)		17 (37.8)		13.547***	
Finding a MD	29 (52.7)		28 (62.2)		0.910	
Adjust to "outside"	18 (32.7)		16 (36.4)		0.143	

* p<0.05

** p<0.01

*** p<0.001

Table IV

Depression as a predictor variable for pre- and post-prison needs and coping self-efficacy score: Multivariate logistic models (N=101)^a

	Depression	Married
	O.R. (95% CI)	O.R. (95% CI)
Competing basic needs and healthcare (x ² likelihood ratio=6.3585, df=1, p=0.012)	2.91 (1.25–6.78)*	<i>ns</i>
Needed help with housing pre-prison (x ² likelihood ratio=13.9684 df=1, p=0.0037)	<i>ns</i>	0.20 (0.04–0.99)*
Needed income post-prison (x ² likelihood ratio=3.0341, df=1, p=0.08)	2.81 (0.89–9.59)~	<i>ns</i>
Needs housing post-prison (x ² likelihood ratio=14.4752 df=2, p=0.0007)	4.07 (1.50–11.04)**	0.25 (0.07–0.89)*
Needs transportation post-prison (x ² likelihood ratio=18.7437, df=1, p<0.0001)	9.15 (2.87–29.19)***	<i>ns</i>
Needs help with adherence post-prison (x ² likelihood ratio=8.3867 df=1, p=0.0038)	8.67 (2.53–29.66)***	<i>ns</i>
Coping self efficacy score above median 207 (x ² likelihood ratio=12.581 df=1, p=0.004)	0.22 (0.09–0.52)***	<i>ns</i>

~ p<0.10

* p<0.05

** p<0.01

*** p<0.001

^a Age, gender, pre-incarceration employment, and race were included in all models and were not found to be significant.

Table V

Coping Self Efficacy Score as a mediator of predictor variables for pre- and post-prison needs: Multivariate logistic models (N=101)^b

	Model 1		Model 2	
	O.R.	95% CI	O.R.	95% CI
<i>Competing basic needs and healthcare</i>				
Depression (CES-D ≥ 12)	2.91	1.25–6.78*	1.97	0.78–4.99
Coping Self-Efficacy score			0.99	0.98–0.99*
Model Statistics	(x ² likelihood ratio=6.3585, df=1, p=0.012)		(x ² likelihood ratio=10.6289, df=2, p=0.0045)	
<i>Needs transportation post-prison</i>				
Depression (CES-D ≥ 12)	9.15	2.87–29.19***	6.27	1.87–21.05**
Coping Self-Efficacy score			0.99	0.98–1.00~
Model Statistics	(x ² likelihood ratio=18.7437, df=1, p<0.0001)		(x ² likelihood ratio=20.3286, df=2, p<0.0001)	

~ p<0.10

* p<0.05

** p<0.01

^b Age, gender, pre-incarceration employment, and race were included in all models and were not found to be significant.