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Prevalence, Diagnosis, and Treatment Rates of Mood Disorders among Opioid Users under Criminal Justice Supervision

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Abstract

Background: Individuals involved in the criminal justice system have disproportionately high rates of psychiatric disorders when compared to the general U.S. population. If left untreated, the likelihood of subsequent arrest increases and risk for adverse health consequences is great, particularly among opioid users.

Objectives: To explore the prevalence and treatment of mood disorders among justice-involved opioid-dependent populations.

Methods: The current study enrolled 258 treatment-seeking opioid-dependent individuals under community-based criminal justice supervision (e.g. probation, parole) screened from the larger parent study, Project STRIDE, a seek/test/treat randomized control trial examining HIV and opioid use treatment. During baseline, individuals were screened for depression using the Patient Health Questionnaire-9 and screened for bipolar disorder using the Mood Disorder Questionnaire tool.

Results: Overall, 78 (30%) participants screened positive for moderate to severe depression and 54 (21%) screened positive for bipolar disorder. Participants self-reported mood disorders at higher rates than they screened positive for these conditions. Participants screening positive for

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Declaration of Interest

All authors declare that they have no conflicts of interest relevant to the contents of the manuscript.

these conditions experienced significantly greater family, legal, and medical problems on the Addiction Severity Index-Lite than those who did not screen positive. Incidence of a lifetime suicide attempt was found to be associated with a positive screen for both mood disorders. Prescribed psychotropic treatment utilization was similar among those who screened positive for depression or bipolar disorder with approximately 38% reporting taking medication.

Importance: Findings suggest universal mood disorder screening to improve comprehensive psychiatric care and treatment of opioid-dependent justice-involved individuals.

Keywords

mood disorder; *heroin*; *opioid*; *Buprenorphine*; *depression*; *bipolar*; *criminal justice*; *mental health treatment*

Introduction

In tandem with 1960s U.S. policy changes that deinstitutionalized state-level mental health and psychiatric service delivery (Steadman, Monahan, Duffee, & Hartstone, 1984), the U.S. criminal justice system has and continues to experience significant surges of individuals with mental health conditions involved in the system, the majority of whom reside in the community. The Bureau of Justice Statistics (BJS) reported in 2006 that approximately 74% of state prisoners and 76% of jail detainees who had a mental health problem also met criteria for substance dependence or abuse (James & Glaze, 2006). At yearend 2010, approximately 1 in 48 U.S. adults were under community-based criminal justice supervision (e.g. probation, parole; Glaze, 2011), mainly attributed to penalties for drug use convictions as a result of chronic and relapsing drug use (Chandler, Fletcher, & Volkow, 2009). Opioid-dependent individuals are particularly more likely to experience comorbid mood disorders when compared to users of other substances (Conway, Compton, Stinson, & Grant, 2006; Martins & Gorelick, 2011), further increasing their likelihood of subsequent criminal justice involvement (Bennett, Holloway, & Farrington, 2008; Kumari, Manalai, Leong, Wooditch, Mansoor, & Lawson, 2016; McGlothlin, Anglin, & Wilson, 1977). It is estimated that the annual cost of heroin dependence due to criminal involvement and medical care in the United States is respectively $5.2 and $5.0 billion (Mark, Woody, Juday, & Kleber, 2001).

Elevated mood symptoms such as mania or hypomania, depression (e.g. major depressive disorder), or the cycling between these two degrees (i.e. bipolar disorder) are the defining features of a mood disorder (American Psychiatric Association, 2015). If inaccurately identified and left untreated, these psychiatric conditions can result in deleterious health consequences among justice-involved individuals, including high risk behavior that can lead to chronic infections such as HIV, lapse of effective treatment, and potentially greater criminal recidivism (Di Paola, Altice, Powell, Trestman, & Springer, 2014; Peters, Bartoi, & Sherman, 2008). Substance abuse can result from self-medication of these disorders (Weiss, Griffin, & Mirin, 1992). Bolton et al. (2009) report from the National Epidemiologic Survey on Alcohol and Related Conditions survey (NESARC) that 24.1% of individuals with mood disorders used alcohol or other drugs for symptom relief, with highest prevalence of use among those diagnosed with bipolar I disorder. Other findings from the NESARC (Grella et

al., 2009) report major depression as the most prevalent disorder (52%) assessed among individuals with lifetime opioid use disorders.

With regard to screening for mood disorders, Lurigio and Swartz (2000) state, "[m]ental disorders in community correction populations are likely to be ignored unless the offenders' psychiatric symptoms are an explicit part of their offenses or are florid at the time of sentencing" (p. 74). Despite high rates of co-occurring mental health conditions in the justice system, there is no formal screen for substance dependence during D.C. jail intake, and inmates are unable to obtain buprenorphine within correctional facilities (Acosta et al., 2010). Key issues related to screening and assessment of psychological conditions exist universally, including insufficient staff training, the use of ineffective and non-standardized screening/assessment instruments, and the separation of mental health and substance use service systems (Substance Abuse and Mental Health Services Administration, 2015). A national survey of community-based and institutional correctional agencies also demonstrates that there are significant differences in screening for substance abuse disorders when comparing drug-treatment prisons, general prisons, jails, state-administered community correctional agencies, and locally administered community correctional agencies, ranging from no assessment to some use of a standardized instrument (Taxman, Cropsey, Young, & Wexler, 2007).

There also remains a need to establish uniform, valid, and reliable methods of screening and identifying people with mood disorders who are involved in the criminal justice system (Osher, Steadman, & Barr, 2003). Even when assessments are conducted, threats to accuracy of tests occur due to unintended consequences related to self-disclosure of mental health or substance use issues when involved in the correctional system (Substance Abuse and Mental Health Services Administration, 2015). Discrepancies between self-report data in comparison to clinical assessment information among individuals suffering acute depression (Prusoff, Klerman, & Paykel, 1972) and other related symptomologies (Corruble, Legrand, Zvenigorowski, Duret, & Guelfi, 1999) have been previously documented. Due to this issue, we examined differences between self-report and mood disorder measurement tools. The Patient Health Questionnaire-9 (PHQ-9) and the Mood Disorder Questionnaire (MDQ) remain quite reliable tools when screening for depression and bipolar disorder in various health settings (Gilbody et al., 2007), but to our knowledge, no systematic studies have assessed mood disorder prevalence using these measurement tools nor examined psychotropic treatment uptake for mood disorders among an opioid-dependent justice-involved population.

The current research aims to (1) investigate the prevalence, socio-demographics, and adverse psychosocial correlates (measured by ASI-Lite composite scores) of screening positive for mood disorders (i.e., depression and bipolar disorder) among an opioid-dependent justice-involved population in Washington, D.C.; (2) examine the degree of concordance between self-reported clinical diagnosis with measures of depression symptomatology using the PHQ-9 and measures of bipolar disorder symptoms using the MDQ; and (3) assess the rates of self-reported prescribed mood disorder medication regimens among the sample. We conclude with a discussion of screening for mood disorders among opioid-dependent justice-

involved individuals and its relationship with psychosocial outcomes and criminal recidivism.

Methods

Participants

Data for this study were based on the parent trial of Project STRIDE, a randomized placebo-controlled trial (RCT) examining the use of buprenorphine plus naloxone (BPN/NLX) among opioid-dependent (primarily heroin users) individuals living with HIV and who are under community supervision (i.e. probation, parole, pre-trial) in Washington, D.C. Data were collected from a screened sample of 258 participants who were assessed for eligibility for the RCT. Participants were recruited through street recruitment efforts, flyers, referrals from community-based organizations, and referrals from other study participants. Eligibility criteria for the RCT screening included: age 18 and older; opioid dependent; living in the D.C. metropolitan area; able to read and understand in English; not currently prescribed opioids by a physician; and not currently receiving medical treatment for opioid dependence. Additional eligibility for full participation in the yearlong RCT required participants to test positive for HIV. Institutional Review Boards (IRB) at Yale University, George Mason University, and Howard University approved all study procedures. Additional protections were offered by the Office of Human Research Protections (OHRP) at the Department of Health and Human Services and a Certificate of Confidentiality was obtained from the National Institutes of Health. The study is registered at www.clinicaltrials.gov (NCT 01550341).

Materials and Procedure

Screening procedures within the parent study involved staff-administered interviews via a Computer-Assisted Self-Interview (CASI) system; a consultation with a physician or psychiatry resident for opioid detoxification; administration of an OraQuick® Rapid HIV 1/2 Antibody test; and urine testing for gonorrhea, chlamydia, and drugs of abuse. CASI screening interviews incorporated the administration of the PHQ-9 (Gilbody, Richards, Brealey, & Hewitt, 2007), an assessment tool for depression symptoms, the MDQ (Hirschfeld et al., 2000), used for the assessment of bipolar symptoms, and the Addiction Severity Index (ASI-Lite), a widely-used instrument for substance abuse and contributing factors (McLellan et al., 1980). Health variables, including a dichotomous self-reported measure of previous mood disorder diagnosis, were derived from the physician assessment. Measures collected also included self-reported currently prescribed and utilized psychotropic medications and a detailed history of illicit drug use (ever and in the past 30 days). Urine drug tests were conducted and the following drugs were tested: cocaine, amphetamines, methadone, other opiates, marijuana, and benzodiazepines.

Data Analysis

The primary outcomes of interest for this sub-study included: 1) criterion scores from the MDQ (sensitivity = 0.73; specificity = 0.90; Hirschfeld et al., 2000); 2) total scores for the PHQ-9[i] (sensitivity = 0.88; specificity = 0.88; Kroenke & Spitzer, 2003); and 3) self-reported psychiatric status and prescribed and current medication use for mood disorder.

The dependent variables were: 1) meeting screening criteria for moderate to severe depression (PHQ-9 score ≥ 10; measured as yes/no); 2) a positive screen for bipolar disorder (MDQ score of 7 or higher; measured as yes/no); and 3) composite scores on all ASI-lite subscales - family, legal, medical, alcohol, and drug use issues (continuous measure ranging from 0 to 1, with higher scores indicating greater problem severity). We hypothesized that there would be relatively high rates of mood disorders among the sample, low rates of prescribed regimen treatments, discordance between self-reported and assessed measures of mood disorders, and that participants who screen positive for depression and bipolar disorder would be at greater odds of experiencing adverse psychosocial outcomes.

All analyses were conducted in the SPSS 19.0 statistical package. Bivariate analyses of several variables were assessed using Chi-Square tests and t-tests. Logistic regression with backwards elimination (Vittinghoff et al., 2005) was then employed to identify socio-demographic characteristics associated with screening positive for depression and bipolar disorder. Model selection was guided by the Hosmer—Lemeshow goodness-of-fit test (Hosmer & Lemeshow, 1980). Significant factors at the $p<0.01$ and the $p<0.05$ levels in the bivariate analysis were included as potential explanatory variables in the regression models and the backwards elimination process excluded select variables until no further improvement in the model was possible. Transgender individuals (n=3) were not included in the final analysis, due to small cell counts during analysis and hence, the inability to identify significant differences among this small representative sample.

Results

Socio-demographic characteristics and differences among 258 participants who underwent study screening are presented in table 1. The sample was primarily African American (98.8%) men (87.6%) slightly over fifty years [50.8 (SD=7.3)] old and unmarried (84.7%). While all met criteria for opioid dependence, about one fifth (21.7%) injected, and most (74.7%) sniffed heroin or other opioids. Additionally, 8.1% of the sample was HIV positive (n=21). Given that all individuals in the sample were currently on community supervision, the average number of reported arrests and/or criminal charges was 14.8 (SD=14.0) and individuals served an average of 11.3 years (SD=9.8) incarcerated.

Prevalence of Screened and Self-Reported Mood Disorders

Participants self-reported mood disorders at higher rates than they screened positive for these conditions. Overall, 30.2% of individuals screened positive for moderate to severe depression on the PHQ-9, while 44.2% of the sample self-reported a diagnosis of depression. With regard to bipolar disorder, 21.3% of the sample screened positive on the MDQ, while 27.5% of the sample self-reported a diagnosis of bipolar disorder. Twelve percent (12.4%) screened positive for both depression and bipolar disorder (we note here that symptoms of bipolar disorder include depression symptomologies and overlap is possible during the screening process though diagnosis is not made). The level of concordance between self-report and a positive screen for a mood disorder is further

[i]* The MQD and PHQ-9 both demonstrated internal consistency (Cronbach's alpha>0.80)

explored in a Chi-Square table (see Table 2). Only 38.6% of those who self-reported depression actually screened positive for moderate to severe depression and 33.8% of those who self-reported bipolar disorder actually screened positive for the disorder. On the other hand, a large percentage self-reported a history of or current symptoms consistent with depression (47.9%) yet did not screen positive on either the PHQ-9 or MDQ.

Factors Associated with a Positive Screen on the PHQ-9 & MDQ

Logistic regression analysis explored the association between receiving a positive screen for depression or bipolar and psychosocial outcomes measured by ASI-Lite composite scores (family, legal, medical, alcohol, and drug use issues). Tables 3 and 4 illustrate adjusted and unadjusted odd ratios of receiving a positive screen on the PHQ-9 and the MDQ, respectively. The adjusted regression models control for socio-demographic variables (i.e. age, gender, education, marital status, employment) of the participants while the unadjusted models do not. The first regression model examines psychosocial variables associated with receiving a positive screen for depression disorder using both an adjusted and unadjusted model (see Table 3). In the unadjusted model, those with family (*OR*=16.20, $p<0.01$), medical (*OR*=5.32, $p<0.001$), and legal (*OR*=9.41, $p<0.001$) problems had significantly greater odds of screening positive for depression on the PHQ-9 tool. In the same unadjusted model, participants with a lifetime suicide attempt had over two times greater odds (*OR*=2.45, $p<0.05$) of screening positive for depression than those without prior attempts. There was a stronger relationship between the ASI-Lite composite measures and screening positive for depression after controlling for participant demographics (see adjusted model in Table 3). Family (*OR*=20.39, $p<0.01$), medical (*OR*=5.90, $p<0.001$), and legal (*OR*=10.12, $p<0.001$) problems were still associated with a higher likelihood of receiving a positive screen for moderate to severe depression.

The second regression model examines psychosocial variables of receiving a positive screen for bipolar disorder using both an adjusted and unadjusted model (see Table 4). The family and drug ASI-Lite composite scores were excluded from these models during the backwards elimination process. In the unadjusted model, lifetime suicide attempts (*OR*=2.89, $p<0.01$) and greater medical (*OR*=4.94, $p<0.001$) and legal (*OR*=7.87, $p<0.01$) problems were significantly associated with a positive MDQ screen for bipolar. Next, the adjusted model shows that controlling for participant demographics slightly decreases the strength of the relationship between the legal and medical composite measures and the likelihood of receiving a positive screen for bipolar disorder (see adjusted model in Table 4). In the adjusted model, higher ASI-Lite composite scores on the legal (*OR*=6.50, $p<0.01$) and medical (*OR*=4.15, $p<0.01$) components were still significantly associated with a positive screen for bipolar disorder on the MDQ tool. In the same model, the odds of screening positive for bipolar is 2.51 times higher ($p<0.05$) for women and 2.56 times higher ($p<0.05$) for those who had a suicide attempt in their lifetime.

Psychiatric Treatment

We further examined rates at which participants self-reported a mood disorder and were currently prescribed and taking their psychotropic medicine. Table 5 represents the use of psychotropic medications by self-reported and screened mental health condition. At the time

of the screening interview, of all participants who self-reported being diagnosed with depression or bipolar disorder, only 50.0% indicated that they were currently prescribed and taking psychotropic medication, and of all participants who self-reported being diagnosed with bipolar disorder, 49.3% indicated that they were currently prescribed and taking psychotropic medication. Among those who did screen positive for depression, only 37.2% reported taking medication, and among those who screened positive for bipolar disorder, only 38.2% reported taking medication.

Discussion

The current study demonstrates high prevalence of depressive symptoms and bipolar disorder among a sample of opioid-dependent individuals under community-based criminal justice supervision in Washington D.C. In our sample, 30% screened positive for moderate to severe depression and 21% screened positive for bipolar disorder. Rates of mood disorders in this sample are consistent with prevalence rates of mood disorders among persons with opioid dependency reported in the NESARC (Conway et al., 2006). Previous research also indicate similar high rates of co-morbid substance use and mood disorders present among justice-involved individuals when compared to those not involved in the justice system (Baillargeon, Contreras, Grady, Black, & Murray, 2000; Louden & Skeem, 2011; Peters & Hills, 1993; Sirdifield, 2012).

Experienced stress in correctional environments result in negative psychological consequences (e.g. depression, social withdrawal) and can lead to maladaptive coping (e.g. self-injury, substance use) while incarcerated and also when released back to the community (National Research Council, 2014).Upon re-entry, releasees may likely encounter living environments with high exposure to drugs, and relapse particularly occurs in the context of experienced medical co-morbidity with other debilitating social circumstances (Binswanger, Nowels, Corsi, Glanz, Long, Booth, Steiner, 2012). In general, justice-involved individuals with comorbid psychiatric disorders experience poorer psychosocial outcomes such as homelessness, violation of the terms of their probation, and return to correctional custody compared to individuals without them (Altice, Kamarulzaman, Soriano, Schechter, & Friedland, 2010; Baillargeon, Williams, Mellow, Harzke, Hoge, Baillargeon, & Greifinger, 2009; Hartwell, 2004; Messina, Burdon, Hagopian, & Prendergast, 2004). Individuals in this study sample indeed faced a convergence of psychosocial issues (i.e., opioid dependency and involvement within the criminal justice system) that are known to disrupt overall quality of life and negatively affect health outcomes (Bizzarri et al, 2009; Wooditch, Lawton, & Taxman, 2013). Failure to appropriately screen and treat justice-involved individuals will also lead to higher rates of substance abuse because they rely on self-medication to manage the symptoms of their mood disorder(s), further increasing their risk of future involvement in the criminal justice system.

The lifetime suicide attempt variable was significantly and positively associated with screening positive for bipolar disorder in both adjusted and unadjusted regression models and with screening positive for depression in the unadjusted regression model. Approximately 15% of our sample experienced a history of sexual abuse which could attribute to their significantly increased mood disorder screening rates and significant history

of suicide attempt (Afifi, Enns, Cox, Asmundson, Stein,& Sareen, 2008). Nock et. al (2010) also highlight that aside from depression best predicting suicide ideation, disorders characterized by anxiety and poor impulse-control (e.g. bipolar disorder, substance use disorders) are stronger predictors for suicide plans and attempts. Further research should be conducted to examine suicide risk particularly among justice-involved individuals with comorbid mental health conditions.

Another parallel between regression models in this study is that legal and medical issues were both significantly related to a positive screen for either bipolar or depression. Several psychosocial co-factors predict both legal involvement and the increased likelihood of experiencing a mood disorder, which explain this commonality between models. Participants with a high ASI-Lite legal composite score in this study had the greatest odds for screening positive for bipolar disorder symptoms, and this variable was also strongly associated with a positive screen for depression symptoms. In the adjusted model, females were significantly more likely to screen positive for bipolar disorder than males. This is unique from previous research outlining no gender differences in rates of bipolar diagnosis (Hendrick, Altschuler, Gitlin, Delrahim, & Hammen, 2000), yet suggests gender differences in phenomenology of the disorder or some unknown systematic differences between genders (Kessing, 2004). Nevertheless, incarcerated women experience overall more medical, psychiatric, and substance use disorders (SUD) than incarcerated men and this should be considered when developing interventions specific for women (Binswanger, Merrill, Krueger, White, Booth, & Elmore, 2010). Analyses from this study also illustrate that individuals with a high ASI-Lite family composite score had the greatest odds for screening positive for depression, but this variable was unrelated to screening positive for bipolar disorder (this variable was excluded during the backwards elimination process). This finding justifies the need for accessible supportive services that may rebuild family relationships or foster family replacement social support systems for opioid-dependent justice-involved individuals living with depression or bipolar disorder.

A highlighted finding from this study is that participants self-reported previous diagnosis of mood disorders at higher rates than were positively screened using the MDQ and PHQ-9 scales. Only 56% of those self-reporting a previous depression diagnosis screened positive for moderate to severe depression and 44% of those self-reporting a previous bipolar disorder diagnosis screened positive for the disorder, suggesting that depression and bipolar may be under-recognized in the study sample. Another explanation of these results, however, could be explained by a difference in validity and reliability of the PHQ-9 and the MDQ for this population and that these tools may not have accurately accounted for the negative experience of incarceration, thus over-screening for depressive symptoms. This may be the reason that a greater legal ASI-Lite composite score was significantly correlated with screening positive for both depression and bipolar disorder among this sample. Di Paola et al. (2014) note similar findings when comparing scores from the Mini International Neuropsychiatric Interview (MINI) (Sheehan et al., 1998) with clinical records of HIV-infected individuals involved in the criminal justice system, pointing to the necessity for more accurate supplementary tools in the diagnoses of psychiatric illnesses (Di Paola et al., 2014). It may also be possible that participants over-reported mental health pathologies as a viable survival strategy given that about only a quarter of the sample were employed and

most relied on disability benefits that may often times be legitimized by their diagnoses (Hansen, Bourgois, & Drucker, 2014).

Essentially, almost half of the study group who experienced mood disorders had not previously been diagnosed by a physician. Furthermore, about 50% of those who self-reported and screened positive for depression and bipolar disorder in this sample were taking psychotropic medications. The rate of prescribed treatment utilization among the sample is similar to results from the National Comorbidity Study in which 52.3% of justice-involved persons received at least minimally adequate treatment for their psychiatric disorders in the prior 12 months (Wang et al., 2005). Adequately treating mood disorders among opioid-dependent individuals may ultimately reduce high reoffending rates among this population. Justice-involved individuals with a mental or SUD are up to three times more likely to reoffend by committing violent acts when compared to individuals who do not suffer from these disorders (Taxman, Perdoni, & Harrison, 2007). Furthermore, treatment of SUD and mood disorders and ensuring continuity of adequate psychiatric illness treatment post-release are essential for improving retention in HIV care for justice-involved persons (Springer, Spaulding, Meyer, & Altice, 2011).

Medical utilization was low - a large percentage of those who reported a previous diagnosis for a mood disorder were not being prescribed a treatment regimen at the time of interview. Among those who did screen positive for depression, only 37% reported taking psychotropic medication for their mood disorders, and among those who did screen positive for bipolar disorder, only 38% reported taking medication. It is possible that those who were on treatment neither experienced nor tested positive for symptoms since they were, in fact, receiving treatment for their mood disorders.

Limitations

Several limitations should be noted for this research study. One limitation of assessing treatment for mood disorders was that only medication treatment was assessed in the interviews. It is unknown whether individuals may have received psychotherapy, which has been shown to be an effective adjunct to pharmacotherapy in the treatment and maintenance of bipolar disorder (Milkloqitz, 2008). Further research and interventions should determine if treatment among this marginalized population is a result of poor adherence, low resources, or the failure to appropriately address societal barriers to treatment in the Washington, D.C. area (it should be noted that all study participants were privately and/or publicly medically insured). Another study limitation is that among those who are currently in psychiatric treatment, screening results for mood disorders may have not detected positive since symptoms may have been abated at the time of interview. Also, fear of incrimination due to mistrust of the interviewer and/or bias that arises when participants are more likely to report what they believe is socially desirable (rather than their true feelings or behavior) may be a data collection concern, particularly because questions inquired about drug use, criminal activity, and other high-risk behaviors. Recall bias of self-reported conditions could have also altered the data since questions pertained to the prior 30 days preceding the interview and some information may have been forgotten during that timeframe. It must also be noted that neither the MDQ nor PHQ-9 is considered a diagnostic test for bipolar disorder or

depression; rather, these screening tools indicate if an individual should undergo further clinical evaluation for these conditions.

This study focuses exclusively on a unique opioid-dependent justice-involved population in Washington, D.C. Results from this study are notable but may not be generalizable in all instances, particularly since the sample is overwhelmingly African-American (98.8%). Previous studies, however, have also demonstrated that African Americans are more likely to experience bipolar and depressive symptoms when compared to Hispanics and Whites, yet less likely to receive diagnosis and proper treatment (Holden, McGregor, Blanks, & Mahaffey, 2012, Lawson & Lawson, 2013; Williams, Gonzalez, & Neighbors, 2007). The consistent finding in this study of a high prevalence/comorbidity of depressive disorders and opioid use disorders among this mostly African American justice-involved sample suggests that future research should aim at improving psychiatric screening, especially among African American justice-involved populations.

Importance

Opioid use and mood disorders are highly associated, particularly among justice-involved individuals. Individually and together, these mental health issues contribute to significant negative health outcomes, including poor retention in care and higher morbidity and mortality when not identified nor treated appropriately. The current study presents further evidence of the disproportionate rates of mood disorders among a predominantly African American community justice-involved population in Washington, D.C. and underscores the urgent need to adequately identify and treat mood disorders in opioid-dependent correctional populations. A positive screening score for depression and bipolar disorder was related to poor outcomes on the ASI-Lite and lifetime suicide attempt. Key issues of screening instrument reliability and validity exist, especially for use within criminal justice settings, and although the Substance Abuse and Mental Health Services Administration (2015) recommends instruments for routine use, there are no data to illustrate that these instruments or DSM-V screenings for mood disorders are being universally implemented among justice-involved populations and there is no national mandate to do so. This study also reports low prescribed psychotropic medication among the sample and suggests that this population may be undertreated at the community level. Based on study findings, we suggest streamlining robust tailored strategies to address the treatment needs of this unique population.

Final Remarks

It is essential to accurately screen for mood disorders and to offer multifaceted treatment strategies for this population to reduce morbidity and mortality. Screenings should take place in opportunistic and routine justice settings, and they require a multidisciplinary care approach (e.g., patient centered medical home model) for substance abuse, mental illness, suicide prevention, and overall primary medical care, given the co-occurrence of illnesses found in our sample. Proper diagnosis and increased availability/access to treatment for mood and SUD among opioid-dependent justice-involved populations can increase treatment rates for mood disorders and possibly decrease the incidence of adverse psychosocial outcomes and repeated involvement in the criminal justice system.

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ABBREVIATIONS

RCT	randomized controlled trial
NIDA	National Institute on Drug Abuse
STTR	Seek, Test, Treat, and Retain
CASI	Computer Assisted Self Interview
PRIME-MD	Primary Care Evaluation of Mental Disorders
PHQ-9	Patient Health Questionnaire-9
MDQ	Mood Disorder Questionnaire
MINI	Mini International Neuropsychiatric Interview
ASI	Addiction Severity Index
GED	General Educational Development
OR	Odds Ratio
BPN	Buprenorphine
NLX	Naloxone

References

1. Acosta J, Blanchard JC, Pollack CE, Benjamin-Johnson R, Adamson DM, Gresenz CR, & Saloner B (2010). Guide to the Behavioral Health Care System in the District of Columbia. Rand Health.
2. Afifi TO, Enns MW, Cox BJ, Asmundson GJ, Stein MB, & Sareen J (2008). Population attributable fractions of psychiatric disorders and suicide ideation and attempts associated with adverse childhood experiences. American journal of public health, 98(5), 946–952. [PubMed: 18381992]
3. Altice FL, Kamarulzaman A, Soriano VV, Schechter M, & Friedland GH (2010). Treatment of medical, psychiatric, and substance-use comorbidities in people infected with HIV who use drugs. Lancet, 376, 367–87. [PubMed: 20650518]
4. American Psychiatric Association. (2015). Diagnostic and statistical manual of mental disorders (5th ed.). Washington, D.C: American Psychiatric Publishing.
5. Baillargeon J, Contreras S, Grady JJ Black SA, & Murray O. (2000). Compliance with antidepressant medication among prison inmates with depressive disorders. Psychiatric Services, 51, 1444–1446. [PubMed: 11058195]
6. Baillargeon J, Williams BA, Mellow J, Harzke AJ, Hoge SK, Baillargeon G, & Greifinger RB (2009). Parole revocation among prison inmates with psychiatric and substance use disorders. Psychiatric Services, 60, 1516–1521. [PubMed: 19880471]

7. Bennett T, Holloway K, & Farrington D (2008). The statistical association between drug misuse and crime: A meta-analysis. Aggression and Violent Behavior, 13, 107–118.
8. Binswanger IA, Nowels C, Corsi KF, Glanz J, Long J, Booth RE, & Steiner JF (2012). Return to drug use and overdose after release from prison: a qualitative study of risk and protective factors. Addiction science & clinical practice, 7(1), 3. [PubMed: 22966409]
9. Bolton JM, Robinson J, & Sareen J (2009). Self-medication of mood disorders with alcohol and drugs in the National Epidemiologic Survey on Alcohol and Related Conditions. Journal of Affective Disorders, 115(3), 367–375. [PubMed: 19004504]
10. Binswanger IA, Merrill JO, Krueger PM, White MC, Booth RE, Elmore JG. (2010). Gender differences in chronic medical, psychiatric, and substance-dependence disorders among jail inmates. Am J Public Health, 100 (3),476–482. [PubMed: 19696388]
11. Bizzarri J, Rucci P, Vallotta A, Girelli M, Scandolari A, Zerbetto E, Sbrana A, Iagher C, & Dellantonio E (2005). Dual diagnosis and quality of life in patients in treatment for opioid dependence. Substance use & misuse, 40 (12), 1765–1776. [PubMed: 16419555]
12. Chandler RK, Fletcher BW, & Volkow ND (2009). Treating drug abuse and addiction in the criminal justice system: improving public health and safety. JAMA, 301(2), 183–190. [PubMed: 19141766]
13. Conway KP, Compton W, Stinson FS, & Grant BF (2006). Lifetime comorbidity of DSM-IV mood and anxiety disorders and specific drug use disorders: results from the National Epidemiologic Survey on Alcohol and Related Conditions. Journal of Clinical Psychiatry, 67, 247–257. [PubMed: 16566620]
14. Corruble E, Legrand JM, Zvenigorowski H, Duret C, & Guelfi JD (1999). Concordance between self-report and clinician's assessment of depression. Journal of Psychiatric Research, 33(5), 457–465. [PubMed: 10504014]
15. Di Paola A, Altice FL, Powell ML, Trestman RL, & Springer SA (2014). A comparison of psychiatric diagnoses among HIV-infected prisoners receiving combination antiretroviral therapy and transitioning to the community. Health & justice, 2(1), 1–10.
16. Gilbody S, Richards D, Brealey S, Hewitt C (2007). Screening for Depression in Medical Settings with the Patient Health Questionnaire: A diagnostic Meta-Analysis. Journal of General Internal Medicine, 22, 1596–1602 [PubMed: 17874169]
17. Glaze LA, & Bonczar TP (2011). Probation and Parole in the United States, 2010 (NCJ 236019). Washington, DC: Bureau of Justice Statistics Report.
18. Grella CE, Karno MP, Wards US, Niv N, & Moore AA (2009). Gender and Comorbidity among individuals with opioid use disorders in the NESARC study. Addiction Behavior, 34, 498–504.
19. Hansen H, Bourgois P, & Drucker E (2014). Pathologizing poverty: New forms of diagnosis, disability, and structural stigma under welfare reform. Social Science & Medicine, 103, 76–83. [PubMed: 24507913]
20. Hartwell S (2004). Triple stigma: persons with mental illness and substance abuse problems in the criminal justice system. Criminal Justice Policy Review, 15, 84–99.
21. Hendrick V, Altshuler LL, Gitlin MJ, & Hammen C (2000). Gender and bipolar illness. The Journal of clinical psychiatry, 61(5), 1–478.
22. Hirschfeld RMA, Williams JBW, Spitzer RL, et al. (2000). Development and validation of a screening instrument for bipolar: the Mood Disorder Questionnaire. American Journal of Psychiatry, 157, 1873–1875. [PubMed: 11058490]
23. Hirschfeld RMA, Cass AR, Holt DCL, Carlson CA (2005). Screening for Bipolar Disorder in patients treated for depression in a family medical clinic. Journal of American Board Family Practice, 18, 233–239
24. Holden KB, McGregor BS, Blanks SH, & Mahaffey C (2012). Psychosocial, socio-cultural, and environmental influences on mental health help-seeking among African-American men. Journal of Men's Health, 9(2), 63–69.
25. Hosmer DW & Lemesbow S (1980). Goodness of fit tests for the multiple logistic regression model. Communications in Statistics - Theory and Methods, 9, 1043–1069
26. James DJ, Glaze LE (2006). Bureau of Justice Statistics special report: mental health problems of prison and jail inmates. Washington (DC): U.S. Department of Justice

27. Kerridge BT, Saha TD, Chou SP, Zhang H, Jung J, Ruan WJ, Smith SS, Huang B & Hasin DS (2015). Gender and nonmedical prescription opioid use and DSM-5 nonmedical prescription opioid use disorder: Results from the National Epidemiologic Survey on Alcohol and Related Conditions–III. Drug and alcohol dependence, 156, 47–56 [PubMed: 26374990]

28. Kessing LV (2004), Gender differences in the phenomenology of bipolar disorder. Bipolar Disorders, 6: 421–425. [PubMed: 15383135]

29. Kroenke K & Spitzer RL (2003). The PHQ-9: A New Depression Diagnostic and Severity Measure. Psychiatric Annals, 32, 1–7.

30. Kumari S, Manalai P, Leong S, Wooditch A, Malik M, & Lawson WB (2016). Factors associated with non adherence to Buprenorphine naloxone among opioid dependent African–Americans: A retrospective chart review. The American Journal on Addictions, 25, 110–117. [PubMed: 26749158]

31. Lopez-Quintero C, Pérez de los Cobos J, Hasin DS, Okuda M, Wang S, Grant BF, Blanco C. (2012). Probability and predictors of transition from first use to dependence on nicotine, alcohol, cannabis, and cocaine: Results of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). Drug and Alcohol Dependence, 115, 120–130.

32. Louden JE, & Skeem JL (2011). Parolees with mental disorder: Toward Evidence-Based Practice. Center for Evidence-Based Corrections. Bulletin of the Center for Evidence-Based Corrections, 7, 1–9.

33. Lurigio AJ, & Swartz JA (2000). Changing the contours of the criminal justice system to meet the needs of persons with serious mental illness. Criminal justice, 3, 45–108.

34. Mark TL, Woody GE, Juday T & Kleber HD (2001). The economic costs of heroin addiction in the United States. Drug and Alcohol Dependence, 61, 195–206. [PubMed: 11137285]

35. Martins SS, & Gorelick DA (2011). Conditional substance abuse and dependence by diagnosis of mood or anxiety disorder or schizophrenia in the US population. Drug and Alcohol Dependence, 199, 28–36.

36. McGlothlin WH, Anglin MD, & Wilson BD (1977). A follow-up of admissions to the California Civil Addict Program. The American Journal of Drug and Alcohol Abuse, 4(2), 179–199. [PubMed: 612196]

37. McLellan AT, Luborsky L, Woody GE, et al. (1980). An improved diagnostic evaluation instrument for substance abuse patients. The Addiction Severity Index. Journal of Nervous and Mental Disorders, 168, 26–33.

38. Meade CS, Bevilacqua LA, Key MD, Primm AB, & Lawson WB (2009). Disparities Among Ethnic Groups: African Americans in Disparities in Psychiatric Care: Clinical and Cross-Cultural Perspectives; Eds. Ruiz P and Primm A, Wolters Kluver /Lippincott Williams & Wilkins.

39. Messina N, Burdon W, Hagopian G, & Prendergast M(2004). One year return to custody rates among co-disordered offenders. Behavioral Sciences and the Law, 22, 503–518. [PubMed: 15282837]

40. Milkloqitz DJ (2008). Adjunctive psychotherapy for bipolar disorder: state of the evidence. The American Journal of Psychiatry, 165, 1408–1918. [PubMed: 18794208]

41. National Research Council. (2014). The Growth of Incarceration in the United States: Exploring Causes and Consequences. Committee on Causes and Consequences of High Rates of Incarceration, Travis J, Western B, and Redburn S, Editors. Committee on Law and Justice, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

42. Nock MK, Hwang I, Sampson NA, & Kessler RC (2010). Mental disorders, comorbidity and suicidal behavior: results from the National Comorbidity Survey Replication. Molecular psychiatry, 15(8), 868–876. [PubMed: 19337207]

43. Osher F, Steadman HJ, & Barr H (2003). A best practice approach to community reentry from jails for inmates with co-occurring disorders: The APIC model. Crime & Delinquency, 49(1), 79–96.

44. Peters RH, Bartoi MG, & Sherman PB (2008). Screening and assessment of co-occurring disorders in the justice system. Delmar, NY: CMHS National GAINS Center

45. Peters RH, & Hills HA (1993). Inmates with co-occurring substance abuse and mental health disorders In HJ Steadman J Cocozza J (Eds.), Providing services for offenders with mental illness

and related disorders in prisons (pp. 159–212). National Coalition for the Mentally Ill in the Criminal Justice System Washington, DC.

46. Primm AB, & Lawson WB (2010). Disparities among ethnic groups: African Americans. Disparities in psychiatric care: Clinical and cross-cultural perspectives, 19–29.
47. Prusoff BA, Klerman GL, & Paykel ES (1972). Concordance between clinical assessments and patients' self-report in depression. Archives of General Psychiatry, 26(6), 546–552. [PubMed: 5027118]
48. Steadman HJ, Monahan J, Duffee B, & Hartstone E (1984). The impact of state mental hospital deinstitutionalization on United States prison populations, 1968–1978. J. Crim. L. & Criminology, 75, 474.
49. Substance Abuse and Mental Health Services Administration (2015). Screening and Assessment of Co-occurring Disorders in the Justice System. HHS Publication No. (SMA)-15–4930 Rockville, MD
50. Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, Hergueta T, Baker R & Dunbar GC (1998). The Mini-International Neuropsychiatric Interview (MINI): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. Journal of clinical psychiatry, 59 (supp 20), 22–33
51. Sirdifield C (2012). The prevalence of mental health disorders amongst offenders on probation: a literature review. Journal of Mental Health, 21, 485–498. [PubMed: 22548345]
52. Spitzer RL, Kroenke K, & Williams JBW (1999). Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. Primary Care Evaluation of Mental Disorders. Patient Health Questionnaire. JAMA, 282, 1737–44 [PubMed: 10568646]
53. Springer SA, Spaulding AC, Meyer JP, & Altice FL (2011). Public health implications for adequate transitional care for HIV-infected prisoners: five essential components. Clinical Infectious Diseases, 53(5), 469–479. [PubMed: 21844030]
54. Taxman FS, Cropsey KL, Young DW, & Wexler H (2007). Screening, assessment, and referral practices in adult correctional settings: A national perspective. Criminal Justice and Behavior, 34(9), 1216–1234. [PubMed: 18458758]
55. Vittinghoff E, Glidden DV, Shiboski S, & McCulloch CE. (2005). Regression Methods in Biostatistics. New York, NY: Springer
56. Wang PS, Lane M, Olfson M, Pincus HA., Wells KB, & Kessler RC. (2005). Twelve-Month Use of Mental Health Services in the United States. Archives of General Psychiatry, 62, 629–640 [PubMed: 15939840]
57. Weiss RD, Griffin ML, & Mirin SM (1992). Drug abuse as self-medication for depression: An empirical study. The American Journal of Drug and Alcohol Abuse, 18(2), 121–129. [PubMed: 1562010]
58. Williams DR, Gonzalez HM, Neighbors H, et al. (2007). Prevalence and distribution of major depressive disorder in African Americans, Caribbean blacks, and non-Hispanic whites: results from the National Survey of American Life. Archives of General Psychiatry, 64, 305–315. [PubMed: 17339519]
59. Wooditch A, Lawton B, & Taxman FS (2013). The geography of drug abuse epidemiology among probationers in Baltimore. Journal of Drug Issues, 43, 231–249.

GLOSSARY

- Mood disorder: a psychological disorder characterized by the elevation or declining of an individual's mood, such as cycling between depression or bipolar disorder
- Depression (major depressive disorder): a psychological disorder that brings about feelings of sadness and/or a loss of interest in daily activities
- Bipolar: a psychological disorder characterized by elevated moods, mania or hypomania, where an individual feels abnormally happy or energetic
- Substance dependence: an adaptive state developed from regular use of a drug, often leading to withdrawal symptoms with cessation of use

Table 1.

Baseline characteristics of opioid-dependent individuals on community correctional supervision who were screened for depression using the PHQ-9 and bipolar using the MDQ (N=258)

			Depression		Bipolar	
		N (%)	% Screened Positive within Baseline Characteristic	T-value or Chi^2 Value (df)	% Screened Positive within Baseline Characteristic	T-value or Chi^2 Value (df)
Variable	**Sample Size**	258	30.2		21.3	
Age	Mean (SD)	50.8 (7.4)	50.0 (7.8)	1.25 (256)	51.2 (7.4)	−0.39 (256)
Gender	*Male*	226 (87.6)	80.8	**4.80 (1)***	78.2	**5.70 (1)***
	Female	32 (12.4)	19.2		21.8	
High School/ GED Completed	*Yes*	191 (74.0)	67.9	2.15(1)	72.7	0.06 (1)
	No	67 (26.0)	32.1		27.3	
Married	*Yes*	40 (15.5)	10.3	2.35 (1)	12.7	0.41 (1)
	No	218 (84.5)	89.7		87.3	
Lived in Shelter in Last 30 days[1]	*Yes*	25 (13.3)	17.2	1.13 (1)	20.9	2.82 (1)
	No	163 (86.7)	82.8		79.1	
Employed	*Yes*	62 (24.0)	15.4	**5.58 (1)***	21.8	0.19 (1)
	No	196 (76.0)	84.6		78.2	
Current Injection Drug Use	*Yes*	56 (21.7)	17.9	0.93 (1)	27.3	1.28 (1)
	No	202 (78.3)	82.1		72.7	
Physical Health Conditions	*Yes*	125 (48.4)	52.6	0.76 (1)	56.4	1.75 (1)
	No	133 (51.6)	47.4		43.6	
Sexual Abuse History	*Yes*	39 (15.1)	14.1	0.09 (1)	12.7	0.31 (1)
	No	219 (84.9)	85.9		87.3	
HIV positive	*Yes*	21 (8.1)	9.0	0.10 (1)	10.9	0.72 (1)
	No	237 (91.9)	91.0		89.1	
Ever attempted Suicide in Life	*Yes*	47 (18.2)	28.2	**7.49 (1)****	32.7	**9.88 (1)****
	No	*211 (81.8)*	*71.8*		67.3	

Note.

[1]missing n=70; Bolded t- or Chi^2 values indicates significance,

* at the p<0.05 level and

** at the p<0.01 level.

Table 2.

Concordance between self-reported previous diagnosis of mood disorders and positive screens for depression and bipolar (N=258)

	PHQ-9 and MDQ screening				
	Total	**No Screened Mood Disorder**	**Screened Positive for Moderate to Severe Depression**	**Screened Positive for Bipolar**	**Screened Positive for Both Disorders**
	N (%)	**N (%)**	**N (%)**	**N (%)**	**N (%)**
Total n (%)	258 (100.0)	157 (60.1)	78 (30.2)	55 (21.3)	32 (12.4)
No Self-Reported Mood Disorder	119 (46.1)	86 (72.2)	25 (21.0)	14 (11.8)	6 (0.05)
Self-Reported Depression	114 (44.2)	58 (50.9)	44 (38.6)	33 (29.0)	21 (18.4)
Self-Reported Bipolar*	71 (27.5)	34 (47.9)	31 (43.7)	24 (33.8)	18 (25.4)
Self-Reported Both Disorders	47 (18.2)	21(44.7)	22 (46.8)	17 (36.2)	13 (27.7)

* Note. One participant missing self-reported bipolar data.

Table 3.

Correlates of screening positive for moderate to severe depression on the PHQ-9 among opioid-dependent individuals under community correctional supervision (N=258)

Covariate	Unadjusted[a]		Adjusted[b†]	
	Odds ratio (95% CI)	P-value	Odds ratio (95% CI)	P-value
Female	---	---	1.79 (0.77–4.15)	0.174
Lifetime suicide attempt	**2.45 (1.21–4.98)**	**<0.05**	1.93 (0.91–4.09)	0.086
Legal composite score	**9.41 (2.85–31.04)**	**<0.001**	**10.12 (2.92–35.05)**	**<0.001**
Medical composite score	**5.32 (2.25–12.60)**	**<0.001**	**5.90 (2.36–14.70)**	**<0.001**
Family composite score	**16.20 (2.01–130.58)**	**<0.01**	**20.39 (2.39–175.40)**	**<0.01**

a. Hosmer and Lemeshow goodness-of-fit test X^2=2.63 , df=8 , p=0.956, Nagelkerke R^2= 0.213

b. Hosmer and Lemeshow goodness-of-fit test X^2=12.30 , df=8 , p=0.139, Nagelkerke R^2= 0.269

† adjusted for age, gender, education, marital status, employment

Table 4.

Correlates of Screening Positive for bipolar disorder on the MDQ among opioid-dependent individuals under community correctional supervision (N=258)

Covariate	Unadjusted[a]		Adjusted[b†]	
	Odds ratio (95% CI)	P-value	Odds ratio (95% CI)	P-value
Female	---	---	**2.51 (1.06–5.93)**	**0.036**
Lifetime suicide attempt	**2.89 (1.40–5.99)**	**0.004**	**2.56 (1.19–5.51)**	**0.016**
Legal composite score	**7.87 (2.16–28.67)**	**0.002**	**6.50 (1.72–24.67)**	**0.006**
Medical composite score	**4.94 (2.01– 12.15)**	**0.001**	**4.15 (1.61–10.70)**	**0.003**
Alcohol composite score	---	---	5.05 (0.99–25.63)	0.051

[a.] Hosmer and Lemeshow goodness-of-fit test X^2=5.56 , df=8 , p=0.693, Nagelkerke R^2=0.173

[b.] Hosmer and Lemeshow goodness-of-fit test X^2=6.36 , df=8 , p=0.607, Nagelkerke R^2=0.210

[†] adjusted for age, gender, education, marital status, employment

Table 5:

Percent of psychotropic medication* utilization among participants with mood disorders (N=258)

Total Sample N (% of those who self-report or screen positive for the condition)							
Depression	Self-reported depression & taking medication	57 (50.0)	**X^2=45.38, df=1**	**Bipolar**	Self-reported bipolar disorder & taking medication	35 (49.3)	**X^2=20.11, df=1**
	Screened positive for moderate to severe depression on the PHQ-9 & taking medication	29 (37.2)	X^2=3.95, df=1		Screened positive for a bipolar disorder on the MDQ & taking medication	21 (38.2)	X^2=3.08, df=1

*Note: psychotropic medications include Mood Stabilizers: Lamotrigine (Lamictal) and Divalproex (Depakote) Atypical antipsychotic: Risperdone (Risperdal) Zyprexa (Olanzapine) Quetiapine (Seroquel) Aripiprazole (Abilify). Antidepressant medication: (Citalopram (Celexa) Sertraline (Zoloft) Bupropion (Wellbutrin) Fluoxetine (Prozac) and Trazadone (Desyrel).

*bolded numbers represent significance at p<0.001