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People who inject drugs and have mood disorders – a brief assessment of health risk behaviors

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Abstract

Background—People who inject drugs have a greater risk of infectious disease and mortality than other substance abusers and nondrug users. Variation in risk behavior among people who inject drugs is likely associated with comorbid mental health disorders.

Objectives—Examine the association between a history of mood disorder and recent risk behavior among people who inject drugs.

Methods—With baseline data from a behavioral HIV prevention clinical trial in a population of people who inject drugs, we used logistic regression models to compare the risk behaviors of people who report a past diagnosis of bipolar disorder (n=113) or depression (n=237) to a comparison group with no history of diagnosed mental illness (n=446). We also assessed differences between groups before and after adjusting for demographic characteristics and current depressive symptoms.

Results—While there were no differences between groups in frequency of drug use, people who inject drugs who report a history of mood disorders reported more injection risk behaviors, drug overdoses, sex exchanges, and multiple partners than those with no history of mental illness. Adjusting the comparison for demographic characteristics and current depressive symptoms had little impact on these findings. Variation in risk between depression and bipolar disorder groups was minimal.

Conclusions/Importance—People who inject drugs and have mood disorders have unique and significant social, clinical, and risk reduction needs. Despite the limited validity of self-reported mental health history, simply asking about a history of mood disorder may be effective for identifying a particularly vulnerable population of people who inject drugs.

Keywords

substance-related disorders; mood disorders; urban populations; harm reduction

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Introduction

With a mortality rate that is substantially higher than that of other drug users, people who inject drugs have higher rates of drug overdose and suicidality (Darke & Hall, 2003; Degenhardt et al., 2006; Havens et al., 2006). Among the health consequences associated with drug addiction, people who inject drugs have a higher risk for a range of infectious diseases – including HIV and Hepatitis C – because of their method of drug use, social marginalization, and high-risk networks (Akselrod et al., 2014; Belani et al., 2012; Brady et al., 2008; Santibanez et al., 2006). Further, comorbid mental illness is common among people who inject drugs and is associated with an increased likelihood of risk behaviors (Lemstra et al., 2011; Mackesy-Amiti et al., 2012; Meade & Sikkema, 2005, 2007; Rosenberg et al., 2001; 2013).

Despite the significant health concerns for PWID, little evidence is available to inform health service providers on the potentially synergistic effects of comorbid mental health disorders on the incidence of risk behaviors among PWID (Buckingham et al., 2013; Mackesy-Amiti et al., 2014). Social marginalization is likely to result in a constellation of health risk behaviors for PWID including unclean “works” (i.e. syringes, cookers, and cotton), exchanging sex, and risky social networks (Lemstra et al., 2011; Mandell et al., 1999). Mood disorders (e.g. depression and bipolar disorder) are among the most prevalent mental health co-morbidities among people who inject drugs (Mackesy-Amiti et al., 2012). Symptoms of the depressive episodes, common to both depression and bipolar disorder include “the presence of sad, empty, or irritable mood, accompanied by somatic and cognitive changes that significantly affect the individual’s capacity to function (American Psychiatric Association. DSM-5 Task Force., 2013).” Among people who inject drugs, depressive symptoms are associated an increased likelihood of sharing works (German & Latkin, 2012; Johnson et al., 2002; Lemstra et al., 2011; Perdue et al., 2003; Stein et al., 2003), exchanging sex (German & Latkin, 2012; Lemstra et al., 2011), inconsistent condom use during sex work (Gu et al., 2010), as well as higher rates of unemployment and homelessness (Perdue et al., 2003); further evidence suggests the higher incidence of risk behaviors among this population is associated with an overall increase in morbidity and mortality (Akselrod et al., 2014; Jin et al., 2013; Pabayo et al., 2013).

Though depressive symptoms are not limited to [unipolar] depression (American Psychiatric Association. DSM-5 Task Force., 2013), much of the literature to date has treated people who inject drugs and have depressive symptoms as a single group. Clinical heterogeneity among this population may be problematic, as the presentation of depressive symptoms can be more severe in individuals with bipolar disorder and may co-occur with symptoms of mania, potentially elevating the associated health risks (Kessler et al., 2006; Kessler et al., 2005; Meade et al., 2011). Mood disorder symptoms can facilitate the initiation of substance use while biological processes, such as neurotransmitter activation and genetic variance, are associated with continuation of substance abuse (Maremmanni et al., 2012; Maremmanni et al., 2008; Maremmanni et al., 2007; Maremmanni et al., 2006).

In their work with people with comorbid substance abuse and bipolar disorder, Meade and colleagues found that symptoms of mania (e.g. grandiosity, decreased need for sleep, racing thoughts, and forced speech), but not depression, were predictive of sexual risk behaviors (Meade et al., 2011). Unfortunately, the small number of people who injected drugs in this study limited assessment of risk behavior among this population subgroup (Meade et al., 2011). While the potential for a substantially elevated risk behavior profile for people who inject drugs and have bipolar disorder is clear, the current evidence base is lacking information on how the risk behaviors of people who inject drugs vary based on their mental health history.

Efforts to address the health needs of our most vulnerable populations in the United States include targeted interventions for people with severe mental illness and co-morbid substance abuse disorders. While needle exchange programs and medications to reverse opioid overdose are becoming more available in recent years, resources remain limited and targeted distribution of these interventions to the most high risk populations may be an effective method of resource allocation. Comparative evidence on the health risk behaviors of people who inject drugs and have co-morbid psychiatric disorders is needed to gauge the potential impact of focusing interventions efforts within this population.

In this study, we used cross-sectional data to assess the frequency of health risk behaviors among a large sample of people who currently inject drugs. Grouping participants according to their history of psychiatric diagnoses (i.e. bipolar disorder, depression, and no history of mental illness), we compare three groups of people who inject drugs on a series of health risk indicators. Building on previous research with people who inject drugs and have depressive symptoms, the current study aims to examine the differences in risk behavior between those with depression and those with bipolar disorder. The presence of depressive symptoms is known to be associated with risk behavior, however, in the current study, we adjust for current depressive symptoms with the expectation that current symptoms will explain only a small portion of the variance in health risk behaviors between groups. In such a case, a simple question about mental health history could be a useful tool for identifying particularly high risk people within the population of people who inject drugs and a method for prioritizing resource allocation.

Methods

Source population

This cross-sectional study uses data collected at the start of a randomized controlled trial evaluating a behavioral intervention to reduce HIV risk behaviors in adults who inject drugs and their social networks in Baltimore (Latkin; Tobin et al., 2011). Baltimore City has the highest rate of injection drug use (Brady et al., 2008) and the 3rd highest HIV prevalence among urban areas in the United States (Centers for Disease Control and Prevention, 2013). Of the people in Baltimore living with HIV with a documented exposure category (>80% total living with HIV), more than half have a history of injection drug use (Center for HIV Surveillance and Epidemiology et al., 2012).

Between 2004 and 2006, the study recruited adults aged 18 or older who had injected drugs in the last 6 months (Latkin; Tobin et al., 2011). Recruitment sources include street outreach, posted advertisements, word of mouth, and referrals from local community-based organizations. These index participants (N=600) then provided a list of members of their social network and described their relationships with each individual. Risk network members aged 18 and older described by the index participant as drug users (i.e., heroin, cocaine, or crack) and/or recent sex partners (i.e., 90 day) were recruited to participate in the trial (N=424). Both index participants and risk network members provided written informed consent prior to the completion of a baseline survey. The baseline assessment included interviewer administered questions about their mental, behavioral, and physical health and service utilization. For more sensitive questions, specifically those on injection drug use and sex risk behavior, participants answered questions using computer-based survey. This research protocol was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

Of the 1,024 participants who completed a baseline survey, 842 participants reported injecting drugs in the last 6 months (Figure 1). All participants of these participants responded to the question *“Have you ever had, or been told by a health professional, that you have a mental illness -- for example, depression, schizophrenia, or serious trouble with your nerves?”* Participants reporting a history of mental illness (n = 395) were asked to specify the mental illness(es) for which they had received a diagnosis from a health professional. Since a diagnostic history that includes both bipolar disorder and depression as likely indicative of variation in mood state during different interactions with different clinicians, bipolar disorder is treated as the superseding diagnosis (American Psychiatric Association. DSM-5 Task Force., 2013). Participants who listed bipolar disorder (or manic-depression) were placed in the bipolar disorder group (n=113). From the remaining group of people who inject drugs and have history of mental illness, participants listing depression comprise the second study (n=237). Remaining participants with a history of mental illness who did not list any mood disorders (N=45) were excluded from this study due to the clinical heterogeneity associated with the range of mental health disorders reported. Participants who report no history of mental illness comprise the comparison group (n = 446).

Measures

Social and Demographic Characteristics—Interviewers collected data on sex, age, race, education, income, unemployment, and health insurance. For the education variable, participants reported the highest level of education that they had completed: less than high school, high school, some college, college, graduate school, or vocational/technical degree. For analytic purposes, we group “vocational/technical” (n=1) with “some college” and “graduate school” (n=3) with “college.” Participants were asked the total amount received from all sources of income, including wages earned in both legal and illegal activities, unemployment, child support, and public assistance over the past month. Participants also reported whether they were unemployed anytime in the last 6 months and whether they currently had any health insurance (public or private). All participants were asked about their current employment status; we describe participants listing their status as disabled as

“unable to work due to a disability.” Participant self-reports of incarceration and homelessness in the last 6 months were used to derive two additional dichotomous measures.

Clinical and Service Use Characteristics—Participants with a history of mental illness were asked to list all previous mental health diagnoses they had received in their lifetime, excluding substance use disorders. We defined participants with comorbid mental health disorders to be those who listed more than one disorder. For descriptive purposes, we use “history of any psychotic disorder” to categorize participants who report schizophrenia, schizoaffective disorder, or any non-specified psychotic episode (American Psychiatric Association. DSM-5 Task Force., 2013).

All participants completed the Center for Epidemiologic Studies Depression Scale (CESD [20-item]), a self-report measure of depressive symptoms in the past week. CESD scores range from 0 to 60 (Radloff, 1977). Research on the psychometric properties of the CESD has established evidence for good reliability and validity of this now widely used measure (Radloff, 1977). Consistent with previous research, we used a score of 23 or greater as an indicator of clinically significant (i.e., moderate to severe) depressive symptoms in a population who injects drugs (Mackesy-Amiti et al., 2014; Perdue et al., 2003).

Participants with a history of mental illness were asked if they had ever been hospitalized due to a psychiatric disorder. All participants were asked about their receipt of services from a “mental health professional such as a psychiatrist, psychologist, or counselor (not including family or a religious counselor) and whether or not they had attended a 12-Step or self-help program for substance abuse, such as Alcoholics Anonymous (AA) or Narcotics Anonymous (NA) in the past 6 months. The survey also included questions about current medication use including medicine for depression, other mental health disorders, and methadone.

In addition to questions specific to mental health, all participants were asked about their physical health history and completed a series of diagnostic tests. We used several questions and results of clinical examinations to establish a history of STD and HIV. First, interviewers asked participants if they had ever been told by a doctor that they had syphilis, gonorrhea, chlamydia, or Trichomoniasis. They were also asked about results of HIV tests they had taken in the past. All participants who consented to testing by the project (86.5% of participants) also completed a urine test for chlamydia and gonorrhea and an oral swab test for HIV (90.4% of participants). All of these variables were combined into a single STD variable. We also created a variable for HIV positive status. We assessed Hepatitis status (A, B, or C) via participant self-report.

Current drug use—Participants were asked about the frequency of their use of a range of drugs (e.g., heroin, crack, cocaine, speedball [combination of heroin and cocaine]) through various modes of consumption (e.g., injection, smoking) over the last 6 months. To describe the frequency of injection drug use, we created dichotomous variables for any use in the last month, any use in the last week, and daily use in the last week. We created dichotomous indicators for current (within last month) use of heroin, cocaine, speedball, and crack cocaine.

Health Risk Indicators—All participants were asked the number of drug overdoses they had in their lifetime; we used these data to create a dichotomous variable for having ever overdosed. Participants answered questions about sexual behaviors with their current (90 days) sex partners. Sex was defined as oral, vaginal, or anal sex. Using data from all participants, we created three dichotomous variables for three sex risk behaviors: (1) multiple sex partners, (2) exchanging sex for money, drugs, food, or shelter, and (3) sex partner is an injection drug user. All participants who had injected drugs in the past 6 months were surveyed about injection drug use associated health risk behaviors within this period (i.e., 6 months). Participants were asked about (1) using a needle when they were unsure it was clean, (2) using an unclean cooker, (3) using unclean cotton, and (4) attendance at “shooting galleries” (i.e. abandoned buildings frequented by people who need a place to inject drugs) in the last 6 months. We created dichotomous measures for the four injection drug use risk indicators.

Statistical Analysis

We used chi square and one-way analysis of variance (ANOVA) to compare sample characteristics and observed frequency of health risk indicators between groups. Using logistic regression models, we quantify the relative odds of reporting each of the health risk indicators for the mood disorder groups (i.e., depression and bipolar disorder) versus the comparison group (i.e., no history of mental illness), and for depression versus bipolar disorder. The adjusted models include variables for age, sex, and race - characteristics selected based on evidence of relationships with the dependent and independent variable (American Psychiatric Association. DSM-5 Task Force., 2013). Some examples of these relationships included the following (1) females have a higher prevalence of depression, are less likely to abuse opiates, and are less likely to engage some health risk behaviors, (2) younger populations are more likely to have mood disorders and engage in health risk behaviors; and (3) variation in the likelihood of mental health diagnosis and engagement in health risk behaviors risk attributable to racial and ethnic discrimination in cultural context of this study. In the final series of logistic regression models, we included a dichotomous indicator of clinically significant depressive symptoms to adjust analysis for the participants' current depressive state.

Results

Sample characteristics and prevalence of risk indicators

Social and demographic characteristics—There were no differences between groups in education completed and only small differences in age. The mean age of participants was in the early 40's and the majority of participants did not graduate high school. Both the depression group and bipolar disorder groups had more female participants than the comparison group (43.5%, 46.9%, and 29.8%, respectively). While the depression group was similar to the comparison group in terms of racial/ethnic composition, the bipolar disorder group had a different composition, with fewer African American or black participants and more white participants (62.8%, 33.6%) than the comparison (85.0%, 14.1%) and depression groups (79.1%, 20.1%). While there was a difference between the comparison and bipolar disorder group in the proportion of those with a total income of less

than \$1,000 a month (82.6% vs. 73.2%), the vast majority of participants across all groups were in this category (depression group 83.9%). The proportion that had experienced unemployment was also extremely high and was over 90% in all categories. A considerable number of participants in each group were unable to work due to a disability, but the proportion in the depression (40.9%) and bipolar disorder (46.9%) groups was higher than in the comparison group (20.2%). The largest differences between groups were for current insurance status. The proportion currently insured was lower for the comparison (26.8%) versus the depression (48.1%) and bipolar disorder (44.3%) groups.

The proportion of participants reporting recent homelessness differed significantly between groups. The lowest proportion reporting homelessness was in the comparison group (30.5%), followed by the depression group (40.5%), and highest in the bipolar disorder group (55.8%). The proportion of participants who reported recent incarceration was similar between groups.

Clinical and service use characteristics—A larger proportion of the bipolar disorder group listed two or more mental illnesses (28.3%) or a history of psychotic disorder (10.6%) than the depression group (16.0% and 5.1%). The mean CESD score differed between all groups, with the lowest mean for the comparison group (17.6), followed by the depression (25.0) and bipolar disorder groups (27.9). There were more participants with a clinically significant level of current depression symptoms in the bipolar (65.5%) and depression (56.5%) groups than in the comparison group (31.2%).

Both the depression and bipolar disorder groups had a large proportion of participants previously hospitalized for psychiatric illness, though the proportion was significantly higher in the bipolar disorder group (44.7% vs. 65.5%). In contrast to the comparison group, the depression and bipolar disorder groups were more likely to report use of mental health services, mental health medication, and self-help groups. Less than a quarter of participants in any group reported current use of methadone treatment.

Across groups, a large proportion of participants reported or tested positive for a sexually transmitted disease. Differences between mood disorder groups were not significant though both groups had a higher lifetime prevalence of STDs than the comparison group (depression 61.6%, bipolar disorder 61.6%, comparison group 49.6%). Differences in HIV status were not significant with proportions HIV positive ranging from 16.0–21.1% across groups. A history of Hepatitis A, B, or C was reported by a substantial portion of the comparison group (33.3%); however, the proportion in both mood disorder groups was substantially higher (depression 53.9%, bipolar disorder 62.8%).

Drug use characteristics—More than 90% of participants reported injection drug use in the last month in each group. There were no statistically significant differences between group in the proportion of participants reporting injection drug use in the last week (all over 80%) and daily use in the last week (all over 40%; Table 1). The majority of participants were currently polydrug users, with more than 90% reporting heroin and more than 75% reporting cocaine use. Around two-thirds of participants in each group reported simultaneously injecting both heroin and cocaine (i.e., “speedball”). More than half of

participants in each group reported use of crack cocaine; however, the proportion was higher for the depression (63.3%) and bipolar disorder (63.7%) groups versus the comparison group (51.6%).

Health Risk Indicators—A greater proportion of people with depression (57.4%) and bipolar disorder (60.2%) reported a drug overdose in their lifetime than people in the comparison group (39.9%). Every sex risk behavior and every drug use risk behavior was significantly more common in the bipolar group than the comparison group. With the exception of having a sex partners who used injection drugs, every sex risk behavior and every drug use risk behavior was more common in both the mood disorder groups than in the comparison group. The bipolar and depression groups did not differ with one exception - having a sex partner who used injection drugs (57.5% vs 46.4%).

Relative Odds of Health Risk Indicators

Models adjusted for age, sex, and race, were mostly consistent with unadjusted comparisons (Table 2). When current depressive symptoms were added to the models, both mood disorder groups were still more likely than the comparison group to report most risk behaviors. Both the depression and bipolar disorder groups were more likely to report a drug overdose, multiple sex partners, exchanging sex, using an unclean needle or cooker. The depression group was also more likely to report using unclean cotton, while the bipolar disorder group was more likely to report a sex partner who injects drugs. None of the differences between the depression and bipolar disorder group were statistically significant in the adjusted models.

Discussion

In this community-based sample, people who inject drugs and report a history of mood disorders were substantially more likely to report a number of health risk behaviors than a comparison group of people who inject drugs with no history of mental health disorder. While there appeared to be no differences between groups on the frequency of drug use, there were significant differences in several risk indicators including: using unclean “works”, attending shooting galleries, drug overdose, sex exchange, and multiple partners. These results suggest that a very brief question on history of diagnosed mental illness may be effective for identifying a particularly vulnerable subgroup of people who inject drugs who engage in more health risk behaviors.

Current depressive symptoms appeared to explain little of the variance in risk behaviors independent of the diagnosis category. Further consideration to why this may be is necessary to understand the results. Risk behaviors were strongly and consistently associated with a history of mood disorder, however the majority of the association with depressive illness is captured in the categorical variables for mood disorder diagnosis which were used to create to comparison groups in the current study. In turn, a current depressive episode seems to be only a small piece of the pathway by which mood disorders are associated with health risk behaviors among people who inject drugs. Other risks associated with mental illness, such as homelessness, recent incarceration, and unemployment, are likely to exacerbate risk behavior (via a causal pathway) and should be considered in the development of risk

reduction interventions for people who inject drugs. Though the differences between groups on some of these potential mediators (e.g. recent incarceration, unemployment) were not statistically significant in this study, further research within a prospective study design may provide additional insight on how these mechanisms may differentially affect the risk for people who inject drugs according to their mental health status.

This research provides new evidence on the higher incidence of health risk behavior among people who inject drugs with a history of mood disorders and, more specifically, information on the variation in risk between those with unipolar depression and bipolar disorder. Previous research shows considerably higher rates of health risk behaviors for people who inject drugs and have depression (German & Latkin, 2012; Gu et al., 2010; Johnson et al., 2002; Lemstra et al., 2011; Perdue et al., 2003; Stein et al., 2003), but the aggregation of people with unipolar depression and bipolar disorder may have masked the heterogeneity of effects. In the current study, we found very few differences between the depression and bipolar disorder groups in the likelihood of engaging in health risk behaviors. However, the use of self-reported diagnostic history is associated with clinical uncertainty, and may have attenuated differences between the two mood disorder groups.

Limitations of the current study

Data used in this analysis were drawn from a study evaluating a risk reduction intervention for people who inject drugs. As such, diagnostic instruments were not included in the survey due to the significant increase in burden for research participants. Self-reported diagnostic history of bipolar disorder has been shown to have some validity (Cluss et al., 1999). However, a self-reported diagnostic history for mood disorders is likely to be less accurate in a population that injects drugs, because these drugs may produce symptoms that mimic depressive and manic symptoms, or alternatively may mask underlying mental health conditions. Though the number of PWID with bipolar disorder included in this study is much larger than seen in previous studies (Meade et al., 2008), it still represents a relatively small sample, potentially limiting power to detect small differences in risk between this group and the other two groups. Future studies with larger sample sizes will be needed to further our understanding of how bipolar disorder, and other less prevalent mental health conditions (i.e., stress disorders, psychotic disorders, and personality disorders), affect risk behavior in PWID.

Finally, our use of cross-sectional data prevents conclusions about causality; even so, the findings provide important information about the potential utility of a simple question on mental health history to identify a particularly vulnerable population of people who inject drugs and have a higher likelihood of health risk behaviors.

With research on the intersection of mental illness and drug abuse as a research priority in United States, disentangling the symptoms of mental illness and drug abuse is a fundamental challenge (National Institute on Drug Abuse, 2008). Previous work with people abusing substances and bipolar disorders provide evidence for a relationship between manic symptoms and injection drug use, sex risk behaviors, and suicidality, as well as a notable chemical interaction between drug abuse and bipolar symptomatology (Maremmani et al., 2007; Meade et al., 2008). However, without a detailed assessment of manic symptoms, this

study was unable to determine if mania, depression, and mixed states were differentially associated with health risk behaviors. To fully understand how symptoms of mood disorders interact with substance use to influence the health risk behaviors of people who both inject drugs and have mood disorders, longitudinal research will need to incorporate assessments of mood states as well specific information about the frequency and types of drug use to disentangle their potentially synergistic effects.

Conclusion/Importance

Results from this study underscore the importance of focused risk reduction interventions for people who inject drugs and have a history of mood disorders. The social, clinical, and health risk behavior profile of people who inject drugs and report a history of mood disorders reveals a multitude of concerns that need to be addressed by a range of social service, physical, mental, and behavioral health providers. Even in absence of diagnostic certainty, people who inject drugs and report a history of mood disorder are more likely to engage in risk behaviors than those with no history of mental illness, suggesting health communication strategies and interventions tailored specifically for this population are warranted. As part of harm reduction efforts with people who inject drugs, a brief mental health assessment could be a valuable approach for focusing more intensive efforts to populations with the greatest needs. To understand the processes by which mood disorders are associated with health risk behaviors among people who inject drugs, future longitudinal research with this population will need to include comprehensive and frequent assessments of psychiatric symptoms, substance use, and health risk behaviors.

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Glossary

Cooker

see works

Cotton

see works

Speedball

combination of cocaine and heroin

Shooting gallery

an abandoned building frequented by people who need a place to inject their drugs

Mood disorder

a mental health class that health professionals use to broadly describe all types of depression and bipolar disorders (Johns Hopkins Medicine)

People who inject drugs

in the current study, defined as anyone who has injected drugs within the last 6 months

Psychotic disorder

Severe mental disorders that cause abnormal thinking and perceptions (MedlinePlus)

Risk reduction

strategies to reduce the risk associated with a particular condition (in the current study injection drug use)

Works

materials used to inject drugs including the cooker and cotton used to prepare the drug for injection and the needle used to inject the drug

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Figure 1.

Participant selection diagram

*One participant who reported injection drug use did not answer the question related to their history of mental health diagnosis

Descriptive Statistics

Table 1

	Comparison N=446		Depression N=237		Bipolar Disorder N=113		P
	n	%	n	%	n	%	
Social and demographic characteristics							
Female	133	29.8	103	43.5	53	46.9	<.001 <i>ab</i>
Age (mean, sd)	43.4	7.9	42.7	8.2	40.9	9.0	.014 <i>b</i>
Race							<.001 <i>bc</i>
Black/African American	379	85.0	185	79.1	71	62.8	
White	63	14.1	47	20.1	38	33.6	
Education							.769
Less than High School	248	55.6	135	57.0	57	50.4	
High school	141	31.6	71	30.0	38	33.6	
Some college	45	10.1	25	10.6	12	10.6	
College graduate	12	2.7	6	2.5	6	5.1	
Income <\$1,000 (1m)	366	82.6	198	83.9	82	73.2	.041 <i>bc</i>
Unemployment (6m)	402	90.1	224	94.5	104	92.0	.141 <i>a</i>
Unable to work due to a disability	90	20.2	97	40.9	53	46.9	<.001 <i>ab</i>
Insured (current)	119	26.8	114	48.1	50	44.3	<.001 <i>ab</i>
Homelessness (6m)	136	30.5	96	40.5	63	55.8	.009 <i>abc</i>
Incarceration (6m)	125	28.0	63	26.6	42	28.9	.103
Clinical and service use characteristics							
2 or more mental health disorders	--	--	38	16.0	32	28.3	.007
History of Psychotic Disorder	--	--	12	5.1	12	10.6	.054
<i>Depressive symptoms (1w)</i>							
CESD score (mean, sd)	17.6	11.1	25.1	11.2	27.9	13.1	<.001 <i>abc</i>
CESD score 23	139	31.2	134	56.5	74	65.5	<.001 <i>ab</i>
Hospitalized for mental illness (ever)	--	--	106	44.7	74	65.5	<.001
Mental health service use (6m)	36	8.1	132	55.7	76	67.3	<.001 <i>abc</i>
12 Step, NA, or AA (6m)	170	38.1	131	55.5	69	61.1	<.001 <i>ab</i>

	Comparison N=446		Depression N=237		Bipolar Disorder N=113		P
	n	%	n	%	n	%	
Any mental health medication (c)	<5	<1.0	80	33.8	47	41.6	<.001 <i>ab</i>
Methadone (c)	81	18.2	55	23.2	20	17.7	.264
Ever had an STD	221	49.6	145	61.2	69	61.6	.004 <i>ab</i>
HIV positive	66	16.5	46	21.1	17	16.0	.310
Hepatitis	147	33.3	126	53.9	71	62.8	<.001 <i>ab</i>
Drug use							
<i>Frequency of injection drug use</i>							
use in last week	370	83.0	192	81.0	92	81.4	.798
daily use in last week	208	46.6	97	40.9	48	42.5	.328
<i>Drugs used (1m)</i>							
Heroin	413	92.6	218	92.0	103	91.2	.866
Cocaine	347	77.8	179	75.5	86	76.1	.780
Speedball	304	68.2	150	62.3	70	62.0	.284
Crack cocaine	230	51.6	150	63.3	72	63.7	.004 <i>ab</i>
Health Risk Indicators							
Ever overdosed (lifetime)	178	39.9	136	57.4	68	60.2	<.001 <i>ab</i>
<i>Sex risk behavior (90d)</i>							
Two or more partners	142	31.8	102	39.4	60	53.1	<.001 <i>ab</i>
Exchange sex	98	22.1	89	37.6	49	43.4	<.001 <i>ab</i>
Partner injects drugs	176	39.6	110	46.4	65	57.5	.002 <i>bc</i>
<i>IDU risk behavior (6m)</i>							
Used needle wasn't sure was clean	141	31.7	117	49.4	59	52.2	<.001 <i>ab</i>
Used unclean cooker	248	55.7	172	75.6	86	76.1	<.001 <i>ab</i>
Used unclean cotton	231	51.9	158	66.7	76	67.3	<.001 <i>ab</i>
Attended shooting gallery	138	30.9	92	38.8	47	41.6	.032 <i>ab</i>

χ^2 or ANOVA *P*value * .05, ** .01, *** .001; pairwise comparisons with *P* .05:

a comparison vs. depression,

b comparison vs. bipolar disorder,

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depression vs. bipolar disorder.

CESD Center for Epidemiologic Studies Depression scale; m month; n number; ns not significant; sd standard deviation; w week. <1% missing data for all measures, cells less than n=5 are suppressed

Table 2

Relative odds of health risk indicators versus comparison group

		Depression		Bipolar Disorder	
		OR	95% CI	P	P
Ever overdosed					
Adjusted		2.19	1.57 to 3.06	<.001	2.52 1.61 to 3.93 <.001
Adjusted + CESD	23	2.11	1.50 to 2.97	<.001	2.40 1.52 to 3.78 <.001
Sex risk behaviors (90d)					
Multiple partners					
Adjusted		1.66	1.19 to 2.33	.003	2.50 1.61 to 3.90 <.001
Adjusted + CESD	23	1.72	1.21 to 2.43	.002	2.61 1.66 to 4.11 <.001
Exchange sex					
Adjusted		2.14	1.50 to 3.05	<.001	2.76 1.75 to 4.35 <.001
Adjusted + CESD	23	2.10	1.46 to 3.02	<.001	2.71 1.70 to 4.31 <.001
Partner is IDU					
Adjusted		1.20	0.86 to 1.67	.284	1.65 1.06 to 2.55 .026
Adjusted + CESD	23	1.16	0.83 to 1.63	.379	1.59 1.01 to 2.48 .044
IDU risk behaviors (6m)					
Use needle wasn't sure was clean					
Adjusted		2.19	1.57 to 3.05	<.001	2.17 1.40 to 3.36 <.001
Adjusted + CESD	23	1.87	1.32 to 2.63	<.001	1.75 1.11 to 2.75 .015
Use unclean cooker					
Adjusted		2.20	1.54 to 3.12	<.001	2.37 1.45 to 3.86 .001
Adjusted + CESD	23	2.01	1.41 to 2.89	<.001	2.11 1.28 to 3.48 .003
Use unclean cotton					
Adjusted		1.90	1.36 to 2.66	<.001	1.83 1.17 to 2.87 .008
Adjusted + CESD	23	1.69	1.20 to 2.39	.003	1.56 0.99 to 2.48 .057
Attended shooting gallery					
Adjusted		1.49	1.07 to 2.10	.020	1.62 1.04 to 2.52 .033
Adjusted + CESD	23	1.34	0.95 to 1.90	.096	1.41 0.89 to 2.21 .139

<1% missing data in all models; adjusted for sex, age, race; CESD Center for Epidemiologic Studies Depression scale; d day; m month; OR odds ratio