Substance Use Among Homeless Individuals With Schizophrenia and Bipolar Disorder

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Abstract: Mental illness and substance use are overrepresented within urban homeless populations. This paper compared substance use patterns between homeless individuals diagnosed with schizophrenia spectrum (SS) and bipolar disorders (BD) using the Mini-International Neuropsychiatric Interview. From a sample of 497 subjects drawn from Vancouver, Canada who participated in the At Home/Chez Soi study, 146 and 94 homeless individuals were identified as BD and SS, respectively. In the previous 12 months, a greater proportion of BD homeless reported greater use of cocaine ($\chi^2 = 20.0$, $p = 0.000$), amphetamines ($\chi^2 = 13{,}8$, $p = 0.000$), opiates ($\chi^2 = 24.6$, $p = 0.000$), hallucinogens ($\chi^2 = 11.7$, $p = 0.000$), cannabinoids ($\chi^2 = 5.05$, $p = 0.034$), and tranquilizers ($\chi^2 = 7.95$, $p = 0.004$) compared to SS. Cocaine and opiates were significantly associated with BD homeless ($\chi^2 = 39.06$, $df = 2$, $p < 0.000$). The present study illustrates the relationship between substance use and BD in a vulnerable urban population of homeless, affected by adverse psychosocial factors and severe psychiatric conditions.

Key Words: Homeless, substance use, bipolar disorder, schizophrenia

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The comorbidity of psychiatric disorders and drug use is a well-documented and widespread problem (Compton et al., 2007). In particular, substance abuse in individuals with schizophrenia shows a high degree of comorbidity (Buckley, 2006; Buckley et al., 2009; Kavanagh et al., 2002; Krystal et al., 2006; Merikangas et al., 2007), as does substance use disorder (SUD) in populations suffering from mood disorders (Compton et al., 2000; Goodwin et al., 2002; Merikangas et al., 1998; Miller et al., 1996) as indicated by a lifetime prevalence of over 50% for individuals with BD (Merikangas et al., 1998; Regier et al., 1990).

The patterns of comorbidity of SUDs, SS, and BD among homeless populations are much less well understood; however, it is well reported that there is a disproportionately high rate of psychiatric disorders among homeless that includes drug and alcohol use disorders (Foster et al., 2012; Gonzalez and Rosenheck, 2002; North et al., 2004). Schizophrenia for example was found in one-quarter of homeless individuals, and mood disorders were documented in one-third of homeless individuals (Folsom and Jeste, 2002; Sullivan et al., 2000). Symptoms of schizophrenia and psychosis has been found both in Canadian (Dealberto et al., 2011) and Australian homeless populations (Herrman, 1990), and affective disorders were found to be quite prevalent as well (Toro et al., 1999), with relatively stable rates across different homeless samples (Fichter and Quadflieg, 2001; Foster et al., 2012). Within a Canadian sample, hypomanic symptoms were also common (Krausz et al., 2013).

Across homeless populations, significant rates of any substance use (Haugland et al., 1997; Kushel et al., 2001) have been reported, in particular cocaine (Appel et al., 2001) and alcohol (Kushel et al., 2001; O'Toole et al., 2004). Although the comorbidity of mental disorder and substance use is well documented, relatively little is understood about the potential relationship between specific substances, and specific disorders such as schizophrenia and bipolar disorder. In order to understand the relationship between substance use and mental illness, it is important to consider the role environmental and psychosocial factors play (Hooley, 2010; Nation and Heflinger, 2006; Uzelac et al., 2006). Additionally, by studying a homeless population whose environment is uniformly characterized by an adverse psychosocial environment provides the means to examine these factors. As such, the purpose of the present study is to explore the pattern of substance use and schizophrenia spectrum (SS) and bipolar disorders (BD) in an urban homeless population.

METHODS

Design

Participants for the present study were from the At Home/Chez Soi study. The At Home/Chez Soi study was a 4-year randomized control study designed to test the effectiveness of the "housing first" approach for homeless mentally ill populations across five major cities in Canada (Goering et al., 2011). For further details, see Goering et al. (2011) and Somers et al. (2013).

Sample

A total of 497 participants were drawn from the Vancouver sample of the At Home/Chez Soi study. All participants were Canadian citizens, at least 19 years of age, met criteria for homelessness or precarious housing, and received a diagnosis of mental illness using the Mini-International Neuropsychiatric Interview (MINI). In addition, the sample drawn for this paper screened for (1) current or past depressive episodes, (2) current or past manic or hypomanic episodes, and (3) current or past psychotic episodes, identifying homeless with schizophrenia spectrum (SS) (including schizophrenia, non-affective psychosis) and bipolar disorders (BD) (including bipolar disorder type II, type I with/without psychotic features). This yielded 146 homeless who were diagnosed with BD and 94 homeless diagnosed with SS.

Instruments

Mini-International Neuropsychiatric Interview (MINI)

Lifetime and current mental and substance use disorders were estimated using the MINI International Neuropsychiatric Interview Plus, version 6.0.0 (Sheehan et al., 1998). The MINI Plus is a structured clinical interview based on the diagnostic criteria in the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) (APA, 1994) and the International Statistical Classification

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of Diseases and Related Health Problems, Tenth Revision (ICD-10) (WHO, 1992). The MINI Plus has demonstrated reliability and validity (Sheehan et al., 1998).

Demographics, Service, and Housing History (DSHH)

Demographic information collected was age, marital status, housing situation, education, source of income, social contacts, age of first homelessness, and total amount of time being homeless. Participants were also asked whether they had ever been in prison, jail, or juvenile detention overnight or longer. They were also asked to identify which ethnic group/descent they belonged to: European/Caucasian, Aboriginal, African, Asian, Hispanic/Latin American, and Other. The Aboriginal peoples—Cree, Carrier, and Dene—who participated in this study represented First Nations found throughout British Columbia (Goering, 2004).

Substances of Use

Substance use in the previous 12 months was also assessed using the MINI. Given the variety of substance use the following eight major groups related to the psychoactive effect of the substances were classified:

1. *Cocaine* (taken as nasal insufflation, intravenous, freebase, crack)
2. *Amphetamines*, which comprise amphetamines, crystal methamphetamine, dextroamphetamine, methylphenidate, and diet pills
3. *Alcohol*
4. *Tranquillizers*, which comprise methaqualone, secobarbital, diazepam, alprazolam, chlordiazepoxide, lorazepam, flurazepam, triazolam, barbiturates, meprobamate, gamma hydroxybutyrate, and flunitrazepam
5. *Hallucinogens*, which comprise lysergic acid diethylamide (LSD), mescaline, peyote, psilocybin, 2,5-dimethoxy-4-methyl-amphetamine (STP), ecstasy (MDMA), methylendioxyamphetamine (MDA), 1-(1-phencyclohexyl) piperidine (PCP), and ketamine
6. *Inhalants*, which comprise ethyl chloride, nitrous oxide, and amyl or butyl nitrate (poppers)
7. *Cannabinoids*, which comprise marijuana, hashish, and Δ9-tetrahydrocannabinol (THC)
8. *Opioids*, which comprise heroin, morphine, hydromorphone, opium, meperidine, methadone, propoxyphene, codeine, oxycodone, and hydrocodone.

Data Analysis

Substance use was compared between SS and BD homeless samples using chi-square and Student's *t*-test as appropriate ($p < 0.05$). Multivariate logistic regression analyses were used to calculate odds ratios for the factors associated with BP homeless, considering the presence of different clusters of substance use (cocaine, opiates, amphetamines, hallucinogens, cannabinoids, tranquilizers). Age and gender controlled for age of first homelessness, total amount of time being homeless, and source of income as confounding variables. All analyses were performed using SPSS 20.0.

RESULTS

Table 1 presents the demographic characteristics of the sample. No differences in age, living situation (alone or otherwise), educational level (less or more than 9 years), occupation (employer or unemployed), ethnicity (aboriginal or otherwise), and source of income (disability income, welfare/income assistance, pension, collecting/recycling, other) were found between BD and SS groups. Moreover, BD and SS groups did not differ on age of first homelessness and total amount of time being homeless, but a significantly greater proportion of the SS homeless were male.

Table 2 shows the differences between BD and SS homeless groups on substance use in the previous 12 months. BD homeless more frequently use cocaine, amphetamines, opiates, hallucinogens, cannabinoids, and tranquilizers. No differences were found on alcohol use and inhalants.

Table 3 shows the results of the logistic regression analysis of the BD group. Substance use variables included in the analysis were those

TABLE 1. Demographic Data of 146 Homeless Affected by BD Homeless Compared to 94 SS Homeless (Entering at Home Study)

		Homeless Affected by			
	Total N = 240	Bipolar Disorder N = 146	Schizophrenia Spectrum N = 94		
	M ± SD	M ± SD	M ± SD	T	*p*
Age	40.50 ± 10.8 (19–74)	40.09 ± 10.5 (19–66)	41.13 ± 11.4 (19–74)	−0.711	0.478
Age of first homelessness	30.57 ± 13.0 (6–74)	29.54 ± 12.9 (6–58)	32.18 ± 13.2 (10–74)	−0.151	0.131
Total amount of time being homeless (mo)	63.62 ± 77.3 (1–720)	63.18 ± 56.8 (1–264)	64.30 ± 101.9 (1–720)	−0.097	0.923
	N (%)	N (%)	N (%)	χ (*df*)	*p*
Gender (male)	174 (72.5)	98 (67.1)	76 (80.9)	5.40	0.026
Living situation (alone: single or divorced)	229 (95.4)	137 (93.8)	92 (97.9)	2.13	0.209
Education (<9 yr)	126 (52.5)	76 (52.1)	50 (53.2)	0.30	0.895
Occupation (unemployed)	224 (93.3)	134 (91.8)	90 (95.7)	1.44	0.294
Ethnicity (aboriginal)	29 (12.1)	21 (14.4)	8 (8.5%)	1.85	0.224
Income				2.737	0.603
Disability income	105 (43.8)	59 (40.4)	46 (48.9)		
Welfare/income assistance	72 (30.0)	49 (33.6)	23 (24.5)		
Pension	11 (4.6)	6 (4.1)	5 (5.3)		
Other[a]	24 (10.0)	15 (10.3)	9 (9.6)		
Collecting/recycling[b]	28 (11.7)	17 (11.6)	11 (11.7)		

[a]Others comprise panhandling, being volunteer, busking, receiving money from family, and sex work.

[b]Collecting and recycling comprise bottles, scrap metals.

TABLE 2. Substances Use (Last 12 Mo) 146 BD Homeless Compared to 94 SS Homeless

	Homeless Affected by			
	Bipolar Disorder N = 146	Schizophrenia Spectrum N = 94		
	N (%)	N (%)	χ	*p*
Cocaine	97 (66.4)	29 (30.9)	20.0	0.000
Amphetamines	48 (32.9)	11 (11.7)	13.8	0.000
Opiates	61 (41.8)	11 (11.7)	24.6	0.000
Hallucinogens	29 (19.9)	4 (4.3)	11.7	0.000
Inhalants	3 (2.1)	0 (0.0)	1.95	0.282
Cannabinoids	76 (52.1)	35 (37.2)	5.05	0.034
Alcohol	67 (45.9)	32 (34.0)	3.31	0.081
Tranquilizers	21 (14.4)	3 (3.2)	7.95	0.004

that showed significant univariate correlation with BD. The significant odds ratios ($\chi^2 = 39.06$, $df = 2$, $p < 0.000$) of BD homeless cocaine use was OR = 2.86 and opiates = OR 3.42. Source of income, living situation, age of first homelessness, and total amount of time being homeless were factored into the equation before substance use as a control for these variables as potential confounding environmental/psychosocial variables in substance use.

DISCUSSION

The present results show that BD homeless report significantly greater use of cocaine, amphetamine, opiates, hallucinogens, cannabinoids, and tranquilizers compared to SS homeless. Specifically, cocaine and opiate use is correlated with BD in a homeless population. Factors associated with being homeless, such as source of income, living situation, age of first homelessness, and total amount of time being homeless, were not found to differentiate BD and SS subjects.

Substance Use in Homeless and Non-Homeless Populations

The existing literature presents a mixed set of findings. First, there are very few studies that have examined substance use and mental illness in homeless populations. These papers have found that substance use between BP and SS individuals was significant, but contrary to the present findings. Overall, substance use is significantly higher in SS compared to BD homeless (40.4% *vs*. 20.6%, respectively) (De Hert et al., 2011; Martins and Gorelick, 2011). Similarly, among non-homeless populations, the existing literature is mixed in that some authors reported that SS individuals use more cannabinoids (Karam et al., 2002; Martins and Gorelick, 2011), centrally stimulating substances (Chengappa et al., 2000; De Hert et al., 2011; Ringen et al., 2008), and opioid (heroin) (Bahorik et al., 2013). However, a number of studies have failed to find any differences between BD and SS individuals on cannabis use (Bahorik et al., 2013; Mueser et al., 2000; Xie et al., 2005), cocaine (Mueser et al., 2000; Xie et al., 2005), heroin (Martins and Gorelick, 2011), tranquilizers (e.g., benzodiazepines and barbiturates) (Clark et al., 2004; Karam et al., 2002) as well as hallucinogens (Mueser et al., 1992). Consistently with our findings, among non-homeless populations, BD is well represented among cannabinoid abusers (Maremmani et al., 2000; Ringen et al., 2008) as well as among subjects using alcohol (Bahorik et al., 2013; Karam et al., 2002; Martins and Gorelick, 2011; Ringen et al., 2008; Xie et al., 2005) and stimulants (Karam et al., 2002; Regier et al., 1990). Previous data on inhalant use among BD community samples suggest a linkage, but the sample sizes were very small (Duggal et al., 2000; Nathan et al., 2009).

Substance Use and Bipolar Disorder

Similarly to our findings among homeless populations, substance use is particularly common in those suffering from BD (Merikangas et al., 2008), and it has been associated with bipolarity in both full-blown expressions (Albanese et al., 2006; Bacciardi et al., 2013; Cassidy et al., 2001; Do and Mezuk, 2013; Elbogen and Johnson, 2009; Jaffee et al., 2009; Maremmani et al., 2008; Maremmani et al., 2006; Mitchell et al., 2007) and temperamental expressions (Maremmani et al., 2009; Pacini et al., 2009). Individuals with mania are 8.4 times more likely to experience lifetime drug dependence as compared to the general population (Do and Mezuk, 2013). More than one-third of individuals with hypomania had a comorbid SUD, and these associations were seen across a range of psychoactive substances (Albanese et al., 2006; Do and Mezuk, 2013), particularly cocaine (Maremmani et al., 2008; Mueser et al., 1992; Pacini et al., 2010; Post and Kalivas, 2013). Individuals with BD would hence have a predisposition for stimulant use to maintain their euphoria (Strakowski and DelBello, 2000) featuring a "self-enhancement" mechanism (Camacho and Akiskal, 2005; Maremmani et al., 2012). Even the linkage between BD and opioids has already been studied (Maremmani et al., 2013a; Maremmani et al., 2013b; Maremmani et al., 2012) at the temperamental level as well (Maremmani et al., 2009; Pacini et al., 2009). For opioid, the opposite can be considered in respect to stimulants: in fact, considering the anti-dysphoric properties of opiates, it has been hypothesized that initially heroin is taken to offset dysphoria, binding abusers to a self-medicating behavior, viciously weakening inner resources (Khantzian, 1985).

Clinical Implication and Future Directions

The present findings suggest that homeless individuals should respond the same way as non-homeless to treatment, and thus simply mediating homelessness by providing housing will not have a great effect on substance use in these populations.

CONCLUSIONS

When the present results are understood in the context of previous research, the relationship between BD and substance use in our homeless population is in line with the one found in non-homeless populations. This indicates that the relationship between BD and substance use is one that exists between the conditions and is not affected by adverse psychosocial factors or hardships from being homeless.

Limitations

Data collected are self-reported and no urinalyses were performed. We considered lifetime psychiatric diagnosis and self-reported substance use in the previous 12 months and therefore do not highlight which specific substances were used during single psychiatric disorders. In addition, the MINI may not adequately rule out secondary bipolar or psychotic conditions (*i.e.*, substance/medication-induced mental disorders, bipolar and related disorder, or psychotic disorder due to another medical condition). Lastly, participants comprising this sample may not

TABLE 3. Logistic Regression: Belonging to BD Homeless Criterion

Predictors	Step	B	Odds Ratio	Min	Max	*p*
Cocaine use	1	1.051	2.86	1.523	5.328	0.001
Opiates use	2	1.230	3.42	1.527	7.660	0.003

Statistics: $\chi^2 = 39.23$, df 2, $p < 0.000$, correct classified 68.8%.

Substance use patterns, gender, age, source of income, living situation, age of first homelessness, and total amount of time being homeless are predictors. Only variables that achieve statistical significance are shown.

be representative of widespread homeless adult population with mental illness. The degree of substance use in either BP or SS homeless populations may depend on how extreme the factors associated with being homeless are in each population. The experience of homelessness is not the same in every city and requires future research.

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DISCLOSURE

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