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Comorbidity between hypomania and substance use disorders

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Abstract

Background—Bipolar disorder is associated with substance use and misuse. However, to date few studies have examined the relationship between hypomania and substance misuse and dependence in the general population.

Methods—Data come from the National Institute of Mental Health Collaborative Psychiatric Epidemiology Surveys (CPES), a set of multi-stage area probability samples of US adults ($N = 10,404$). Multivariable linear and logistic regression was used to assess the relationship between DSM-IV hypomania and nicotine, alcohol, cannabis, cocaine, and prescription drug use. Models were adjusted for age, gender, education, and marital status. Stratified analyses and interaction terms were used to determine whether the relationship between hypomania and substance misuse varied by race/ethnicity.

Results—The 12-month prevalence of hypomania was 0.5%. Hypomania was more common among African Americans (0.9%) relative to non-Hispanic Whites (0.5%) or other race/ethnicities (0.7%). Individuals with hypomania were 3.6 (95% CI: 1.5, 8.5) and 2.9 (95% CI: 1.3, 6.8) times more likely to also meet criteria for alcohol abuse/dependence and drug abuse/dependence relative to individuals without. The relationship between hypomania and substance use outcomes did not vary by race/ethnicity.

Limitations—The primary limitation of this study is its cross-sectional design, which precludes any inference about the causal nature of comorbid hypomania-substance use.

Conclusions—Hypomania is associated with increased likelihood of substance use and dependence/abuse across a broad range of substances. These associations were consistent across racial/ethnic groups. Findings indicate that even sub-syndromal conditions, such as hypomania, are significantly related to substance use and misuse in the community.

Keywords

Hypomania; Substance use; Psychiatric comorbidity; Substance abuse/dependence

1. Introduction

1.1. Background

Comorbid substance use and misuse with psychiatric disorder is prevalent among both clinical and general population samples (Martins and Gorelick, 2011). Approximately 28.9% of individuals diagnosed with a mental disorder have also been diagnosed with a substance use disorder at some point in their lifetime (Miele et al., 1996). In the context of bipolar disorder, individuals with mania are 8.4 times more likely to experience lifetime drug dependence as compared to the general population (Helzer and Pryzbeck, 1988; Kessler et al., 1996a). Patient population studies have confirmed that comorbid patients are at a higher risk of mood lability, impulsivity, and violence (Salloum et al., 2002), as well as increased rates of psychiatric hospitalization and slower remission from manic episodes (Brady et al., 1991; Cassidy et al., 2001). The etiology of substance comorbidity is not well understood; however, it is hypothesized that substance use may be a coping mechanism by which individuals attempt to manage early symptoms or prodromes of manic and depressive episodes (Healy et al., 2009). This points to the need to study sub-syndromal psychiatric conditions, such as hypomania, in the development and treatment of substance use disorders.

Among US adults, the lifetime prevalence of bipolar disorder spectrum (BPS) disorders is 4.4% (Merikangas et al., 2011). The prevalence of BPS disorders varies by race/ethnicity. For example, the prevalence is 4.9% among non-Hispanic Blacks, 3.2% among non-Hispanic Whites, and 4.3% among Hispanics (Breslau et al., 2006a). Hypomania, a less severe form of elevated, expansive, or irritable mood that lasts only a few days at a time (Smith and Nassir Ghaemi, 2006), is a relatively rare condition, and only constitutes about 2.4% of all BPS cases (Merikangas et al., 2011). Over one-quarter of individuals who meet criteria for hypomania also have a substance use disorder (Grant et al., 2004). However, few studies have investigated the association between hypomania and substance use; and to our knowledge, only one small clinic-based study has examined whether this association may vary by race (Roberts, 2000).

Building on the limited research concerning hypomania in the general population, the goal of this study is to examine the comorbidity between hypomania and substance use, and to assess whether this comorbidity differs across racial/ethnic groups. Previous studies indicate that non-Hispanic Blacks have significantly lower odds of having most psychiatric conditions (a notable exception is bipolar disorder) relative to non-Hispanic Whites, but this group tends to have more persistent and potentially more severe psychopathology once a disorder onsets (Breslau et al., 2005b). If the relationship between hypomania and substance use and abuse is moderated by race/ethnicity, this indicates that interventions may need to be tailored to these differential groups. Even if race/ethnicity does not moderate the relationship between hypomania and substance use, it is still an important factor to consider when examining this association because groups that have higher prevalence of hypomania (e.g., non-Hispanic Blacks and Hispanics) are more likely to be impacted by comorbid substance use problems. Thus, there may be racial/ethnic disparities in comorbid substance disorders that need to be specifically targeted by mental health providers.

1.2. Study aims

The purpose of this study is three-fold: (1) to estimate the comorbidity of hypomania and comorbid substance use and misuse in the general population, (2) to examine how the degree of comorbid substance use and misuse varies across a range of both licit (alcohol and tobacco) and illicit (cannabis, cocaine, and prescription/other drugs) substances and (3) to determine if the strength of association between substance use and hypomania differs across race/ethnicity.

2. Methods

2.1. Sample

Data come from the National Institute of Mental Health Collaborative Psychiatric Epidemiology Surveys (CPES). The CPES is made up of three nationally representative surveys conducted between 2001 and 2003: the National Comorbidity Survey Replication (NCS-R) (Kessler et al., 2004b), the National Survey of American Life (NSAL) (Jackson et al., 2004), and the National Latino and Asian American Study (NLAAS) (Algeria et al., 2004). Briefly, each of these surveys used a multi-stage area probability design to select their target sample: the NSC-R is nationally representative sample of the entire US population ($N = 9282$); the NSAL is nationally-representative sample of Black Americans (e.g., African Americans and Blacks of Caribbean decent) ($N = 6199$); and the NLAAS is nationally-representative sample of Latino and Asian Americans ($N = 4649$). The response rates for these surveys were 70.9%, 72.3%, and 75.5%, respectively. The CPES studies all utilized the same diagnostic instrument to assess psychopathology (described below). A more detailed discussion of sampling methodology is described elsewhere (Heeringa et al., 2004).

For the present study, respondents who met criteria for 12-month bipolar disorder I, bipolar disorder II, or major depressive disorder were excluded from analysis (N excluded = 1177). The final analytic sample size was 10,404.

2.2. Measures

In all three CPES samples, the Composite International Diagnostic Inventory (CIDI) was used to assess psychiatric and substance use disorders, as categorized in the 1994 Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (Kessler et al., 1998c). The CIDI is a fully structured diagnostic instrument that has moderate concordance with clinical assessments (Haro et al., 2006). Hypomania was defined as having experienced: *a distinct period of abnormally and persistently elevated, expansive, or irritable mood lasting at least 4 days*. This elevated mood had to be accompanied by at least three of the following symptoms (four symptoms if the mood change was irritable only): (1) inflated self-esteem or grandiosity, (2) decreased need for sleep, (3) more talkative than usual or pressure to keep talking, (4) flight of ideas or subjective experience that thoughts are racing, (5) distractibility, (6) increase in goal-oriented activity (either socially, at work or school, or sexually) or psychomotor agitation, and (7) excessive involvement in pleasurable activities that have high potential for painful consequences (e.g., buying sprees and sexual indiscretions). These symptoms cannot be severe enough to cause marked impairment in

social or occupational functioning, or to necessitate hospitalization; and there are no psychotic features. Symptoms had to be present in the past 12 months (American Psychiatric Association, 2000).

Multiple measures of substance use and misuse were assessed in order to develop a comprehensive picture of the relationship between hypomania and substance use disorders. For each of five substances (nicotine, alcohol, cannabis, cocaine, and prescription/other drugs) variables were created that quantified (a) lifetime (ever/never) use; (b) age of first use; (c) recency of use; and (d) frequency of use in the past 12 months. For example, nicotine use was indexed by having ever smoked a cigarette, cigar, or pipe (even a single puff); self-reported age that the respondent began smoking regularly, and number of cigarettes smoked per day among current smokers. Similar metrics were used for alcohol, cannabis, cocaine, and prescription/other illicit drugs.

Lifetime (“have you ever used...”) and current use (“did you use... at any time in the past 12 months?”) across all substances were categorized as binary variables (yes vs. no). Except for the frequency measure for nicotine use, in which respondents were asked to indicate the number of cigarettes smoked daily, all other substance use frequency measures asked: “How often did you use [the substance] in the past twelve months—nearly everyday, 3–4 days a week, 1–2 days a week, 1–3 days a month, or less than once a month?” Responses to these questions were treated as continuous. An additional alcohol frequency measure asked respondents to indicate, “On the days you drank in the past 12 months, about how many drinks did you usually had per day?” Responses to this measure were dichotomized at the median into the following categories: less than two drinks/day and two drinks or more/day. Age of first use was treated as a continuous variable for each substance.

The CIDI was also used to assess concurrent (that is, in the past 12 months) DSM-IV substance use disorders: nicotine dependence, alcohol abuse and dependence (which were combined into a single abuse/dependence variable for analysis due to small sample size), and drug abuse and dependence (which were also combined for analysis). All respondents who met criteria for the combined drug abuse/dependence also met criteria for drug abuse only. Of those respondents who met criteria for the combined alcohol abuse/dependence variable: 0.04% only met criteria for dependence, 62.4% met criteria for abuse, and 37.6% met criteria for both.

Potential confounding variables included in the regression analyses were: age, sex, years of education, and marital status. Education was categorized as 0–11 years, 12 years, 13–15 years, and 16 or more years. Marital status was categorized as never married, divorced, widowed, or separated, and married. Race was categorized as non-Hispanic White, African American, and Hispanic/Asian/other race/ethnicity. Although the NLAAS sample is restricted to adults of Latino and Asian descent, there were too few cases of hypomania in these groups to examine them separately.

2.3. Analysis methods

Weighted means and proportions were calculated comparing respondents with current (past 12 months) hypomania to respondents without and evaluated using Chi-square tests for

categorical variables and t-tests for continuous variables. To assess whether the association between hypomania and substance use was moderated by race, a series of multivariable regression analyses were fit; all models adjusted for age, sex, education and marital status. Logistic regression was used for categorical outcomes (e.g., lifetime use of each substance and 12-month nicotine, alcohol and drug use disorders) and linear regression was used for continuous outcomes (e.g., age at first use and frequency of use). Moderation of the relationship between hypomania and these substance use outcomes was evaluated using stratified analyses and interaction terms; in instances where there was no evidence of moderation by race, this variable was instead included as a covariate in the regression model. Models were fit using PROC Surveylogistic and PROC Surveyreg in SAS (version 9.2, SAS Institute Inc., Cary NC) to account for the CPES complex sampling design. All *p*-values refer to two-tailed tests.

All participants in the CPES provided informed consent, and the NCS-R, NSAL and NLAAS were approved by the University of Michigan Institutional Review Board.

3. Results

3.1. Demographics

Approximately 0.5% of all respondents met DSM-IV criteria for hypomania in the past 12 months. As shown by Table 1, these respondents differed from those without hypomania in terms of marital status ($X^2 = 42.0$ and *p*-value < 0.05) and age ($t = -12.9$ and *p*-value < 0.01). Although greater proportion of African Americans met criteria for hypomania relative to non-Hispanic Whites (0.9% vs. 0.5%), race/ethnicity was not statistically different between the two groups. Education and gender did not statistically differ between the two groups.

3.2. Prevalence of substance use and abuse/dependence

As shown by Table 2, of respondents with hypomania: 55.0% had ever smoked tobacco, 95.5% had ever consumed alcohol, 50.0% had ever used cannabis, 31.8% had ever used cocaine, and 29.5% had ever used prescription or other drugs. The prevalence of alcohol, cocaine, and prescription/other drug use was significantly higher among individuals with hypomania relative to those without, but there was no difference in the use of nicotine or cannabis between the groups.

The age of first use differed by substance type. As expected, first use of licit drugs (alcohol and nicotine) occurred at earlier ages relative to illicit substances. Hypomania was positively associated with current (past 12 month) use of all illicit substances (cannabis, cocaine, and prescription/other drugs). For example, 49.3% of respondents with hypomania reported using cocaine in the past 12 months, as compared to only 7.9% of respondents without ($X^2 = 20.9$, *df* = 1, and *p*-value < 0.01). Consistent with previous research on bipolar disorder and substance abuse and dependence, hypomania was positively associated with presence of nicotine dependence (Odds Ratio (OR): 2.9, 95% CI: 0.9, 9.4), alcohol abuse/dependence (OR: 3.8, 95% CI: 1.8, 7.9), and drug abuse/dependence (OR: 2.9; 95% CI: 1.4, 6.0). However, the association between nicotine dependence and hypomania was not statistically significant. In total, 34.3% of respondents with hypomania met criteria for at least one

substance use disorder as compared to 16.0% of respondents without ($X^2 = 8.1$, $df = 1$, and p -value < 0.01).

3.3. Association between hypomania and extent of substance use

Foremost, there was no evidence from either stratified analyses or interaction terms that the relationship between hypomania and substance use varied by race/ethnicity (data not shown); for example, the p -value for the interaction between hypomania and race on drug dependence/abuse was 0.2 (OR = 0.5; 95% CI: -1.7, 0.3). Therefore, in all models race/ethnicity was included as a covariate. In general, the association between hypomania and substance use was stronger for illicit substances relative to licit substances.

In crude models, hypomania was significantly associated with likelihood of using illicit substances. For example, hypomania was associated with 1.6 (95% CI: 0.8, 3.2) higher odds of lifetime cannabis use; 2.6 (95% CI: 1.2, 5.8) higher odds of lifetime cocaine use; and 2.6 (95% CI: 1.2, 5.7) higher odds of lifetime prescription/other drug use. However, these associations were no longer statistically significant following adjustment for age, gender, race, education, and marital status.

Hypomania was associated to the age of first use for alcohol, but not any of the other licit or illicit substances, after adjustment for covariates (Tables 3 and 4). Age first drank alcohol was 2.2 years (p -value = 0.01) earlier, on average, for individuals with hypomania compared to those without, after adjusting for age, gender, race, education, and marital status. As for recency of substance use, hypomania was only significantly associated with the current use of cocaine (OR = 2.9; 95% CI: 1.1, 8.2), following adjustment by covariates. Hypomania was not significantly associated with frequency of current drug use for any substance.

Hypomania was positively associated with likelihood of meeting criteria for drug dependence/abuse and alcohol dependence/abuse, but not nicotine dependence. The association between hypomania and drug abuse/dependence was the strongest, indicating that individuals with hypomania are 3.6 (95% CI: 1.5, 8.5) times more likely to meet DSM-IV criteria for drug abuse/dependence compared to those without hypomania (Table 5). These associations remained significant following adjustment by age, gender, race, and marital status.

4. Discussion

The primary finding from this study is that even sub-syndromal forms of bipolar disorder, such as hypomania, are associated with a wide range of substance use and misuse outcomes. More than one third of individuals with hypomania had a co-morbid substance use disorder, and these associations were seen across a range of psychoactive substances. These relationships are similar across racial/ethnic groups. Although hypomania is a relatively rare condition, because of the strength of the association between this condition and substance abuse/dependence, it may be an important contributor to the initiation and progression of substance use disorders.

We found no evidence that the relationship between hypomania and substance use and misuse was moderated by race; however, in this study non-Hispanic Blacks were more likely to meet criteria for hypomania relative to non-Hispanic Whites. This indicates that although the relative risk of substance use and abuse associated with hypomania is not greater among African Americans; the absolute risk of these outcomes may be more substantial. For example, the calculated population attributable risk (PAR) percentage for drug abuse/dependence associated with hypomania is approximately 2.8% for African Americans, which is almost double the PAR for non-Hispanic Whites (1.7%) in this sample. We did not find evidence for the hypothesis that the likelihood of developing comorbid substance use disorders in the context of mania varies by race (Roberts, 2000). However, our findings do not preclude the possibility that the pathways leading to psychiatric-substance use comorbidity may vary by race/ethnicity. For example, for socially-disadvantaged minority groups it may be particularly important to develop interventions that focus on increasing access to economic and healthcare resources and reducing labor market disadvantages (Breslau et al., 2005b) following onset of a psychiatric disorder like hypomania.

Although this was a cross-sectional study and thus we were unable to examine whether hypomania preceded or followed substance use onset, we can infer from examining the ages of onset that substance use tended to occur before hypomania onset (average age of onset for hypomania is 22 years) (Merikangas et al., 2011). This is inconsistent with the hypothesis that individuals with hypomania may be using illicit substances to prolong their states of elation (Kaminer and Bukstein, 2008) under a self-medication hypothesis (Quitkin et al., 1972), since symptoms of hypomania are expected to precede substance use/misuse. However, there is relatively little research on the role of illicit substances as coping strategies with mania or hypomania (Bolton et al., 2009), and thus this self-medication hypothesis should be examined more explicitly. Alternatively, substance use may precipitate states of hypomania, as has been suggested elsewhere with cannabis use and psychosis (Degenhardt and Hall, 2002; Arseneault et al., 2004; Linszen and van Amelsvoort, 2007). Longitudinal data is needed to understand the natural history of comorbid hypomania and substance use and abuse.

These findings should be interpreted in light of strengths and weaknesses. One of the main strengths of this study is that unlike previous studies that have primarily relied on clinic-based samples, this study utilized a large, nationally representative, diverse population-based sample. This enhances the generalizability of our findings, and potentially the internal validity of the results since the assessment of hypomania and substance use disorders was not dependent on receipt of clinical care or detection. It is established that clinic populations tend to have much higher prevalence of comorbidity, particularly if the sample is drawn from mental health services clinic (McKay et al., 2002; Ritscher et al., 2002; Dodge et al., 2005). This study also investigated several different types of substances including cocaine and illicit prescription drug use, which provides a more comprehensive picture of the relationship between hypomania and substance use and misuse. The primary limitation of this study is its cross-sectional design, which precludes any inference about the causal nature of comorbid hypomania-substance use. However, we attempted to address this limitation by leveraging data on age of onset for these outcomes.

This study highlights the utility for comprehensive approaches to the treatment of comorbid psychiatric-substance use disorders generally. Comorbidity is a sign of disease severity, and substance use comorbidity in particular contributes to poorer treatment outcomes and higher economic costs relative to treating substance use disorders alone (Hoff and Rosenheck, 1998a, 1999b). Since more than 80% of all severe current psychiatric disorders occur among 13% of the population in the US who have a lifetime history of three or more disorders (Kessler et al., 1994d), the prevention of the onset of a secondary (or tertiary) disorder may help to reduce a large proportion of all lifetime psychiatric disorders.

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Table 1

Demographic characteristics of the CPES sample stratified by hypomania status.

	Hypomania <i>N</i> (wt%)	No hypomania <i>N</i> (wt%)	χ^2 or <i>t</i> , df, <i>p</i> -value
Total <i>N</i> (<i>N</i> = 10,404)	75 (0.5)	10,329 (99.5)	–
DEMOGRAPHIC INFORMATION			
<i>Race</i>	–	–	3.1, 2, 0.21
African American	44 (23.3)	5112 (12.8)	–
Non-Hispanic White	26 (69.6)	4388 (81.8)	–
Other race	5 (7.1)	829 (5.3)	–
<i>Marital status</i>	–	–	58.5, 2, < 0.01
Married	29 (28.9)	5034 (58.4)	–
Divorced, widowed or separated	10 (6.4)	2637 (20.7)	–
Never married	36 (64.7)	2658 (20.8)	–
<i>Education</i>	–	–	2.2, 3, 0.52
0–11 years	19 (18.1)	1925 (15.1)	–
12 years	23 (28.3)	3380 (32.6)	–
13–15 years	21 (36.6)	2766 (27.5)	–
16+years	12 (17.0)	2258 (24.8)	–
<i>Gender</i>	–	–	1.0, 1, 0.31
Male	27 (56.6)	4206 (47.8)	–
Female	48 (43.4)	6123 (52.2)	–
Age [Mean (SE)]	28.9 (1.8)	46.3 (0.3)	–13.3, 76.7, < 0.01

Table 2

Substance use characteristics of the CPES sample stratified by hypomania status.

	Hypomania N (wt%)	No hypomania N (wt %)	χ^2 or t , df , p -value
Total N (N = 10,404)	75 (0.5)	10,329 (99.5)	–
NICOTINE MEASURES			
Ever Smoke	6 (55.0)	1159 (50.6)	0.0, 1, 0.79
Age first smoked [Mean (SE)]	15.8 (1.0)	17.7 (0.1)	–1.2, 1649, 0.22
Number of cigarettes smoked daily [Mean (SE)]	15.9 (4.2)	11.7 (0.3)	1.4, 1019, 0.17
ALCOHOL MEASURES			
Ever drink	61 (95.5)	8431 (98.6)	4.5, 1, 0.03
Age first drank [Mean (SE)]	12.6 (0.6)	15.5 (0.1)	–4.8, 61, < 0.01
Frequency of drinking in the past 12 months ^a [Mean(SE)]	3.4 (0.2)	3.8 (0.0)	1.6, 49.7, 0.12
Number of drinks each time you drink	–	–	2.5, 1, 0.11
Less than two drinks	3 (9.7)	1057 (29.6)	–
Two drinks or more	23 (90.3)	2436 (70.4)	–
CANNABIS MEASURES			
Ever use cannabis	36 (50.0)	4143 (38.2)	1.9, 1, 0.17
Age first used cannabis [Mean (SE)]	15.4 (1.0)	18.3 (0.1)	–2.9, 35.6, < 0.01
Used cannabis in the last 12 months	15 (40.4)	909 (19.6)	4.5, 1, 0.03
Frequency of cannabis use in the past 12 months ^a [Mean(SE)]	2.8 (0.4)	3.6 (0.1)	1.9, 918, 0.06
COCAINE MEASURES			
Ever use cocaine	18 (31.8)	1335 (14.9)	6.6, 1, 0.01
Age first used cocaine [Mean (SE)]	19.8 (1.6)	21.6 (0.2)	–1.1, 17.3, 0.29
Used cocaine in the last 12 months	6 (49.3)	132 (7.9)	20.9, 1, < 0.01
Frequency of cocaine use in the past 12 months ^a [Mean(SE)]	4.8 (0.2)	4.6 (0.1)	–0.8, 6.3, 0.44
PRESCRIPTION/OTHER DRUG MEASURES			
Ever use prescription/other drugs	21 (29.5)	1266 (13.7)	6.3, 1, 0.01
Age first used prescription/other drugs [Mean (SE)]	17.7 (1.0)	19.6 (0.2)	–1.9, 19.4, 0.07
Used prescription/other drugs in the last 12 months	10 (14.3)	254 (2.6)	12.7, 1, < 0.01
Frequency of prescription/other drugs in the past 12 months ^a [Mean(SE)]	3.4 (0.5)	4.3 (0.1)	0.6, 114, 0.56
SUBSTANCE USE DISORDER MEASURES			
Nicotine dependence	5 (20.7)	467 (8.0)	3.5, 1, 0.06
Drug dependence or abuse	16 (26.9)	679 (6.0)	23.6, 1, < 0.01
Alcohol dependence or abuse	22 (31.5)	1111 (10.7)	14.4, 1, < 0.01

^a Frequency of substance use within the last 12 months responses included: (1) nearly everyday, (2) 3–4 days/week, (3) 1–2 days/week, (4) 1–3 days/month, or (5) less than once a month.

Table 3

Association between hypomania and licit substance use.

	Model 1: unadjusted OR (95% CI)	Model 2: Model 1 adjusted for age OR (95% CI)	Model 3: Model 2+gender, race, education, and marital status OR (95% CI)
NICOTINE MEASURES			
Ever smoke	1.2 (0.3, 4.6)	1.1 (0.3, 4.0)	1.2 (0.3, 4.9)
Age first smoked (beta)	-2.0 (-3.9, -0.005)	-1.8 (-3.6, 0.004)	-1.7 (-3.2, 0.004)
Number of cigarettes smoked daily (beta)	4.2 (-0.007, 8.3)	4.1 (-0.014, 8.3)	4.4 (0.023, 8.8)
ALCOHOL MEASURES			
Ever drank alcohol	0.3 (0.1, 1.0)	0.3 (0.1, 1.1)	0.6 (0.2, 2.1)
Age first drank (beta)	-3.0 (-5.9, -0.001)	-2.2 (-4.4, -0.002)	-2.2 (-4.4, 0.002)
Frequency of drinking in the past 12 months ^a (beta)	-0.3 (-0.6, -0.000)	-0.3 (-0.5, 0.001)	-0.3 (-0.5, 0.001)
Number of drinks consumed on days that drank	3.9 (0.6, 24.0)	2.6 (0.5, 13.5)	2.6 (0.5, 13.2)

Values are Odds Ratio (95% Confidence Interval), unless otherwise noted.

^aFrequency of alcohol use within the last 12 months responses categorized as: (1) nearly everyday, (2) 3–4 days/week, (3) 1–2 days/week, (4) 1–3 days/month, or (5) less than once a month.

Table 4

Association between hypomania and illicit substance use.

	Model 1: unadjusted OR (95% CI)	Model 2: Model 1 adjusted by age OR (95% CI)	Model 3: Model 2+gender, race, education and marital status OR (95% CI)
CANNABIS MEASURES			
Ever use cannabis	1.6 (0.8, 3.2)	0.9 (0.4, 1.8)	0.9 (0.5, 2.0)
Age first used cannabis (beta)	-2.9 (-5.8, 0.004)	-0.8 (-1.6, 0.002)	-0.8 (-1.6, 0.002)
Cannabis use in the last 12 months	2.8 (1.1, 7.5)	1.8 (0.7, 4.5)	1.6 (0.6, 3.8)
Frequency of cannabis use in the past 12 months ^a (beta)	-0.8 (-1.6, 0.002)	-0.7 (-1.4, -0.001)	-0.5 (-0.9, 0.001)
COCAINE MEASURES			
Ever use cocaine	2.6 (1.2, 5.8)	1.7 (0.8, 3.9)	2.0 (0.9, 4.4)
Age first used cocaine (beta)	-1.8 (-2.1, -1.4)	0.4 (-0.001, 0.8)	0.07 (-0.002, 0.1)
Used cocaine in the last 12 months	11.3 (3.0, 42.1)	8.2 (2.8, 24.1)	2.9 (1.1, 8.2)
Frequency of cocaine use in the past 12 months ^a (beta)	0.2 (-0.001, 0.4)	0.1 (-0.000, 0.225)	0.1 (0.000, 0.183)
PRESCRIPTION/OTHER DRUG MEASURES			
Ever use prescription/other drugs	2.6 (1.2, 5.7)	1.6 (0.7, 3.5)	1.7 (0.8, 3.9)
Age first used prescription/other drugs (beta)	-1.9 (-3.8, -0.004)	-0.7 (-0.2, 0.002)	-0.2 (-0.5, 0.003)
Used prescription/other drugs in the last 12 months	6.1 (2.0, 19.1)	2.8 (0.9, 8.8)	1.8 (0.4, 7.3)
Frequency of prescription/other drug use in the past 12 months ^a (beta)	-0.9 (-1.8, 0.002)	-0.6 (-1.3, -0.002)	0.3 (0.003, 0.5)

Values are Odds Ratio (95% Confidence Interval), unless otherwise noted.

^aFrequency of substance use within the last 12 months responses categorized as: (1) nearly everyday, (2) 3–4 days/week, (3) 1–2 days/week, (4) 1–3 days/month, or (5) less than once a month.

Table 5

Association between hypomania and co-occurring substance use disorders.

	Model 1: unadjusted OR (95% CI)	Model 2: Model 1 adjusted by age OR (95% CI)	Model 3: Model 2+gender, race, education, and marital status OR (95% CI)
SUBSTANCE USE DISORDER MEASURES			
Nicotine dependence	3.0 (0.9, 10.1)	2.8 (0.9, 9.5)	2.9 (0.9, 9.4)
Drug dependence or abuse	5.8 (2.6, 12.8)	3.9 (1.5, 7.8)	3.6 (1.5, 8.5)
Alcohol dependence or abuse	3.8 (1.8, 8.1)	3.0 (1.4, 6.3)	2.9 (1.3, 6.8)

Values are Odds Ratio (95% Confidence Interval).