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**Gender differences in lifetime psychiatric and substance use disorders among people who use substances in Barcelona, Spain**

Journal:	<i>Advances in Dual Diagnosis</i>
Manuscript ID	ADD-01-2017-0002.R1
Manuscript Type:	Research Paper
Keywords:	psychiatric disorders, substance use disorders, gender, secondary analysis, illicit drug users, Psychiatric Research Interview for Substance and Mental Disorders (PRISM)

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3 **Gender differences in lifetime psychiatric and substance use disorders**  
4 **among people who use substances in Barcelona, Spain**  
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8

9 **Abstract**

10 **Purpose**

11  
12 To examine gender differences in lifetime substance use and non-substance  
13 use (non-SUD) psychiatric disorders among illicit drug users and determine  
14 factors associated with non-SUD psychiatric disorders independently for males  
15 and for females.  
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22 **Design**

23  
24 Secondary analysis of five cross-sectional studies conducted in Barcelona,  
25 Spain during 2000-2006. Lifetime DSM-IV substance use and non-SUD  
26 psychiatric diagnoses were assessed using the Spanish Psychiatric Research  
27 Interview for Substance and Mental Disorders among 629 people who use  
28 substances (68% male) recruited from treatment (n=304) and out of treatment  
29 (n=325) settings. Odds ratios (OR) and 95% confidence intervals (CI) were  
30 calculated using binary logistic regression.  
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40 **Findings**

41  
42 The prevalence of any lifetime psychiatric (non-SUD) disorder was 41.8%, with  
43 major depression (17%) and antisocial personality disorder (17%) being the  
44 most prevalent disorders. After adjusting for age and study, the odds of having  
45 any lifetime non-SUD (OR 2.10; 95%CI 1.48, 2.96); any mood disorder (OR  
46 2.13; 95%CI 1.46, 3.11); any anxiety disorder (OR 1.86; 95%CI 1.19; 2.92); any  
47 eating disorder (OR 3.09; 95%CI 1.47, 6.47); or borderline personality disorder  
48 (OR 2.30; 95%CI 1.36, 3.84) were greater for females than males. Females  
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3 were less likely than males to meet criteria for antisocial personality disorder  
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5 (OR 0.59; 95%CI 0.36, 0.96) and attention deficit disorder (OR 0.37; 95%CI  
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7 0.17, 0.78).  
8

### 9 10 **Research limitations/implications**

11  
12 Psychiatric disorders are common among people who use substances, with  
13  
14 gender differences reported for specific disorders. **Gender-sensitive** integrated  
15  
16 treatment approaches are required to prevent and **to** address comorbidity  
17  
18 psychiatric disorders among this population.  
19

### 20 21 **Originality/value**

22  
23 This secondary analysis of five cross-sectional studies included a large sample  
24  
25 size allowing sufficient power to examine differences between men and women.  
26  
27 An additional strength of the methodology is the use of the gold standard  
28  
29 PRISM which was used to assess disorders.  
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### 34 35 **Key words**

36  
37 psychiatric disorders; substance use disorders; illicit drug users; Psychiatric  
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39 Research Interview for Substance and Mental Disorders (PRISM); gender  
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41 differences; secondary analysis.  
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## Introduction

The incidence of comorbid psychiatric disorders is higher among people who use substances than among people who do not (Flynn and Brown, 2008). The prevalence of comorbid substance use and psychiatric disorders ranges from 15-100% depending on the population studied, the timeframe considered and the assessments used (Flynn and Brown, 2008; Torrens *et al.*, 2015; Kingston *et al.*, 2016). Among people who use substances from clinical and non-clinical populations, the most common mental health comorbid disorders are mood, anxiety, and personality disorders (Hasin *et al.*, 2004; Torrens *et al.*, 2015; Torrens *et al.*, 2011; Kingston *et al.*, 2016).

Gender differences have been reported in the prevalence of co-occurring psychiatric disorders among people who use substances. Generally, women report higher prevalence than men of the following disorders: depression, anxiety, (including post-traumatic stress and panic disorders), eating disorders and borderline personality disorder, and men are more likely to report higher prevalence of antisocial personality disorder, psychosis and attention deficit and hyperactivity disorder (ADHD) (e.g. for recent reviews see Torrens *et al.*, 2015; Kingston *et al.*, 2016). Biological and psychosocial differences between men and women influence the “prevalence, presentation, comorbidity, and treatment of substance use disorders” (Back *et al.*, 2006).

People who use substances and have a co-occurring mental health disorder compared to those who do not, have poorer outcomes for both disorders (Boden and Moos, 2009; Flynn and Brown, 2008; Magura *et al.*, 2009). They also report sexual and drug use risk behaviours which could increase the risk of blood borne viruses in this population (Khalsa *et al.*, 2008),

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3 and increased unemployment, homelessness and criminal behaviour (Krausz *et*  
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5 *al.*, 2013; Greenberg and Rosenheck, 2014). This profile contributes to the high  
6  
7 treatment, legal and societal costs for people with comorbid disorders  
8  
9 (DeLorenze *et al.*, 2014; Whiteford *et al.*, 2013).

10  
11 While strong evidence of gender differences in comorbidity exists, there  
12  
13 is a gap in understanding of the relationships between specific mental disorders  
14  
15 and specific substance use disorders (Torrens *et al.*, 2015), by gender. Sordo  
16  
17 *et al.* (2012) argue that “few studies have evaluated whether there are different  
18  
19 predictive factors for men and women” and that such information is required to  
20  
21 inform prevention, diagnosis and treatment. The majority of previous research  
22  
23 has been undertaken among clinical or general population samples. This study  
24  
25 also provides the opportunity to consider out of treatment drug users.  
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29 The current study aimed to explore 1) gender differences in lifetime substance  
30  
31 use and psychiatric disorders among people using different substances  
32  
33 recruited from treatment and non-treatment settings; 2) risk factors for  
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35 psychiatric disorders among substance users, independently by gender; and 3)  
36  
37 associations between psychiatric disorders and substance use disorders,  
38  
39 independently by gender.  
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## 45 **Methods**

### 46 **Design, participants and settings**

47  
48 Secondary analysis was conducted using data from 629 (201 females, 32.0%)  
49  
50 users of illicit substances from five cross-sectional studies conducted in  
51  
52 Barcelona, Spain during 2000-2006 (Torrens *et al.*, 2011). In total, 304 (82  
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54 females, 27.0%) were recruited from treatment settings and 325 (119 females,  
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3 36.6%) were recruited from out of treatment settings. One hundred and fifteen  
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5 (38 females, 33.0%) consecutive admissions to an inpatient detoxification unit  
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7 of a teaching hospital (Nocon *et al.*, 2007) and 189 (44 females, 23.3%)  
8  
9 consecutive admissions to three municipal outpatient low-threshold methadone-  
10  
11 maintenance programs (Astals *et al.*, 2008) constituted the treatment sites. A  
12  
13 random sample of 139 (52 females, 37.4%) cocaine (Herrero *et al.*, 2008) and  
14  
15 149 (49 females, 32.9%) heroin users (Rodriguez-Llera *et al.*, 2006) aged 18-30  
16  
17 years were recruited from street sites using targeted sampling and nomination  
18  
19 techniques as part of a larger cohort study (de la Fuente *et al.*, 2005; Pulido *et*  
20  
21 *al.*, 2009). Thirty seven (18 females, 48.6%) Ecstasy users aged 18-35 years  
22  
23 were recruited via word of mouth in a pharmacological research unit to the  
24  
25 study on the Neurotoxic Effects of Ecstasy (Martín-Santos *et al.*, 2010).  
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### 32 **Instruments**

33  
34 DSM-IV substance use (abuse or dependence) disorders (SUD) and Axis I  
35  
36 (mood, anxiety, eating, psychotic and attention deficit and hyperactivity  
37  
38 disorders) and Axis II (antisocial and borderline personality disorders) non-  
39  
40 substance use psychiatric disorders (non-SUD) were diagnosed using the  
41  
42 Spanish Psychiatric Research Interview for Substance and Mental Disorders  
43  
44 (PRISM) (Torrens *et al.*, 2004). The PRISM differentiates between the expected  
45  
46 effects of intoxication and withdrawal, and between primary (independent) and  
47  
48 substance-induced disorders (Hasin *et al.*, 1998). The PRISM was administered  
49  
50 by trained psychologists or psychiatrists in all studies to assess patient  
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52 demographics, and “current” (previous 12 months) and “past” (criteria were met  
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3 before the previous 12 months). Lifetime disorder categories were created for  
4  
5 the purpose of this paper.  
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7 Test-retest reliability (Hasin *et al.*, 2006), inter-rater reliability (Morgello *et*  
8  
9 *al.*, 2006) and validity (Torrens *et al.*, 2004) to diagnose psychiatric disorders  
10  
11 among substance users, have been demonstrated using the PRISM.  
12  
13

14 In addition to SUD and Non-SUD diagnoses, the following variables were  
15  
16 included from each study: participants' sex, age, civil status, highest level of  
17  
18 education attained, employment status, living arrangements, drug use history,  
19  
20 HIV and hepatitis C virus (HCV) status.  
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## 25 **Statistical Analysis**

### 26 ***Procedure***

27  
28 Data were analysed using SPSS version 22. Descriptive statistics were  
29  
30 calculated using frequencies and percentages for categorical data and means  
31  
32 and standard deviations (SD) for continuous data. Odds ratios (OR) and 95%  
33  
34 confidence intervals (CI) were calculated using binary logistic regression.  
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38 Differences by gender of participant in demographics, lifetime substance use  
39  
40 and non-SUD psychiatric disorders are presented in Table 1, with and without  
41  
42 adjusting for study setting and age. Tables 2 and 3 describe the associations  
43  
44 between lifetime non-SUD psychiatric disorders and substance use disorders,  
45  
46 independently for females and males. Tables 4 and 5 describe the factors  
47  
48 associated with lifetime non-SUD for females and males, respectively.  
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## 54 **Results**

### 55 **Demographics**



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3 The majority of the sample was male (68%). The mean age of participants was  
4  
5 28.6 years (SD 7.1). After adjusting for age and study, females were  
6  
7 significantly more likely to be married or cohabiting than males; were less likely  
8  
9 to be employed or studying; or to have ever been imprisoned than males (Table  
10  
11 1). Women were over twice as likely to be squatting or homeless as men  
12  
13 (compared to living alone). However, once the data were adjusted for age and  
14  
15 study, the gender difference was no longer significant.  
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### 20 21 **Substance Use**

22  
23 There were no differences by gender in the age of first use of cocaine, heroin or  
24  
25 alcohol; or in the onset of habitual substance use. After adjusting for age and  
26  
27 study, females were significantly older than males when they first used  
28  
29 cannabis (Table 1). Almost 60% of males and 53% of females had ever  
30  
31 injected drugs. Approximately 20% of males and females were HIV  
32  
33 seropositive. There was no difference in the prevalence of HCV status between  
34  
35 males and females (39% vs 48%). Females were less likely than males to meet  
36  
37 criteria for any (abuse or dependence) substance use disorder, for poly  
38  
39 substance use disorder and for heroin, cannabis and alcohol abuse or  
40  
41 dependence disorders. Males met criteria for a significantly greater number of  
42  
43 lifetime substance use disorders than females (3.6 vs. 3.1) (Table 1).  
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### 49 50 **Axis I psychiatric disorders (non-SUD)**

51  
52 The incidence of any Axis 1 psychiatric (non-SUD) disorder was 41.8%, with  
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54 major depressive disorder (17%) being the most common. The odds of having  
55  
56 any non-SUD were over two times greater for females than males even after  
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3 adjusting for age and study (Table 1). After adjusting for age and study, females  
4  
5 were over twice as likely as males to meet criteria for any mood disorder  
6  
7 (including over two times as likely to meet criteria for major depressive  
8  
9 disorder); almost two times as likely to meet criteria for any anxiety disorder  
10  
11 (including over four times as likely to meet criteria for specific phobia, and over  
12  
13 three times as likely to meet criteria for panic disorder with agoraphobia and  
14  
15 PTSD); and over three times as likely to meet criteria for an eating disorder.  
16  
17 Females were less likely to meet criteria for attention deficit disorder than males  
18  
19 after adjusting for age and study. There were no differences by sex for the  
20  
21 proportion of participants meeting criteria for any substance induced disorders  
22  
23 (Table 1).  
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27 After adjusting for age and study, women who met criteria for a lifetime  
28  
29 Axis I non-SUD psychiatric disorder were more likely than those who did not to  
30  
31 have ever been in prison or to be HCV seropositive (Table 2); and for men  
32  
33 lower educational attainment or ever been in prison (marginally significant) were  
34  
35 associated with a lifetime Axis I non-SUD psychiatric disorder (Table 3).  
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#### 40 **Axis II personality disorders**

41  
42 Over a fifth of the sample met criteria for antisocial or borderline personality  
43  
44 disorders. **After adjusting for age and study, women were more likely than men**  
45  
46 **to meet criteria for borderline personality disorder, and less likely than men to**  
47  
48 **meet criteria for antisocial personality disorder** (Table 1).  
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#### 53 **Associations between specific lifetime SUD and psychiatric disorders**

#### 54 **(non-SUD) by sex**

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3 Tables 4 and 5 describe the associations between specific SUD and psychiatric  
4 disorders (non-SUD) for women and men respectively. For women, alcohol or  
5 hallucinogen disorders increased the odds of having a mood disorder; cocaine  
6 and hallucinogen disorders increased the odds of having an anxiety disorder; a  
7 hallucinogen disorder increased the odds of having an eating disorder; sedative  
8 and stimulant disorders increased the odds of having a psychotic disorder;  
9 opiates, cocaine, cannabis and poly substance disorders increased the odds of  
10 having an antisocial or borderline personality disorder; and alcohol, cocaine,  
11 stimulants, cannabis, hallucinogens and poly substance disorders increased the  
12 odds of having a substance induced disorder. For men, cocaine and poly  
13 substance use disorders increased the odds of having a mood disorder; a  
14 stimulant disorder increased the odds of having an anxiety disorder; stimulant  
15 and hallucinogen disorders increased the odds of having an eating disorder; an  
16 alcohol disorder increased the odds of having a psychotic disorder; all  
17 substance use disorders (including poly substance use disorder) increased the  
18 odds of having an antisocial or borderline personality disorder; and cocaine and  
19 hallucinogen disorders increased the odds of having a substance induced  
20 disorder.  
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### 45 Discussion

46 Men were more likely than women to meet criteria for any substance use  
47 disorder, for poly substance use disorder and for heroin, cannabis and alcohol  
48 abuse or dependence disorders. They were also more likely to report a greater  
49 number of lifetime substance use disorders than females.  
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3 Co-occurring disorders among people who use substances recruited  
4 from in and out of treatment settings is common. Over 4 in 10 participants  
5 (almost 4 in 10 men and over 5 in 10 women) included in the studies met  
6 criteria for any lifetime axis 1 psychiatric (non-SUD) disorder, and over 2 in 10  
7 men and women met criteria for any lifetime antisocial or borderline personality  
8 disorder. The prevalence of any lifetime (non-SUD) axis I substance-induced  
9 disorders was substantially lower (15%) than primary or independent psychiatric  
10 disorders (64%). While lifetime mood and anxiety disorders were more likely to  
11 be independent disorders, psychotic disorders although less prevalent, were  
12 more likely to be substance induced disorders. Contrary to other studies (Niciu  
13 *et al.*, 2009; Schuckit *et al.*, 2007), the current did not report significantly higher  
14 rates of substance-induced disorders among men. It is important for clinicians to  
15 distinguish between psychiatric disorders that are independent and those that  
16 are substance-induced have different risk factors, prognosis and treatment  
17 outcomes, with recent research highlighting an increased risk for relapse  
18 following treatment for those with substance induced versus independent major  
19 depressive disorder (Connor *et al.*, 2014; Foulds *et al.*, 2015; Langas *et al.*,  
20 2012; Samet *et al.*, 2013; Torrens *et al.*, 2011). As a result, substance induced  
21 and independent psychiatric disorders may require different interventions and  
22 treatment approaches.

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48 Women were more likely than men to have ever had any mood disorder;  
49 any anxiety disorder; any eating disorder or borderline personality disorder; and  
50 men were more likely than females to have ever had antisocial personality  
51 disorder or attention deficit disorder. Potential explanations for these gender  
52 differences have include that women who use substances have often

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3 experienced greater adverse events in childhood and adulthood (including  
4 abuse, intimate partner violence, sex trading) than men who use substances  
5 (Afifi *et al.*, 2012; Choo *et al.*, 2014; Verona *et al.*, 2015; Gilchrist *et al.*, 2015)  
6  
7 which may contribute to the higher prevalence of mood and anxiety disorders.  
8  
9 In addition, a greater proportion of women report higher depression and anxiety  
10 disorders in childhood and adolescence than men, which is a risk factor for a  
11 recurrent episode (Gilchrist and Gunn, 2007). Perhaps as a result of these  
12 issues, several studies have reported that for women, psychiatric disorders are  
13 more likely to predate the substance use disorder (Kessler, 2004).  
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23 The odds of having a personality disorder in the current study were  
24 higher for both men and women with polysubstance use disorders. For men  
25 personality disorders were associated with alcohol and drug use disorders,  
26 whereas for women they were associated with opiate, cocaine and cannabis  
27 use disorders. We found that borderline personality was more prevalent among  
28 females than males, and antisocial personality disorder was more prevalent  
29 among males than females. Lewis and Grenyer (2009) stress the role of trauma  
30 in the “etiology and phenomenology” of borderline personality disorder. Zanarini  
31 *et al.* (2005) found a higher prevalence of adulthood physical and sexual abuse  
32 among people with borderline personality disorder compared to patients with  
33 another personality disorders. It has been suggested that the lower prevalence  
34 of antisocial personality disorder among women may be underestimated “due to  
35 the requirement of childhood conduct disorder symptoms” (Dolan and Völlm,  
36 2009, pp. 2) for a diagnosis. This includes physical aggression in adolescence  
37 that may result in more males than females being diagnosed.  
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3 Women who met criteria for a lifetime Axis I non-SUD psychiatric  
4 disorder were more likely to have ever been imprisoned or to be HCV  
5 seropositive. The increased prevalence of psychiatric disorders among men  
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10 and women who use substances in the criminal justice service have been  
11 reported (eg. Prins, 2014; Torrens *et al.*, 2015). While data were not collected  
12 on whether participants had received treatment for HCV, Martin-Santos *et al.*  
13 (2015) suggest that “both the hepatitis C infection and antiviral treatment  
14 (especially when using the pro-inflammatory cytokine interferon  $\alpha$ ), are  
15 highly associated with depression, where female gender constitutes a risk  
16 factor”. Also women who have experienced trauma report higher rates of  
17 depression (eg. Trevillion *et al.*, 2012) and injecting risk behaviours (eg.  
18 Khalsa *et al.*, 2008) attributed to hepatitis C acquisition, which may contribute  
19 to this finding.  
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32 Similar to other studies, we found that men who met criteria for a lifetime  
33 Axis I non-SUD psychiatric disorder were more likely to only have a primary  
34 education, to have ever been in prison (marginally significant) or to be  
35 unemployed or receiving benefits (Krausz *et al.*, 2013; Greenberg and  
36 Rosenheck, 2014).  
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### 45 **Strengths and limitations**

46  
47 This secondary analysis is limited as it includes five cross-sectional studies,  
48 therefore it was not possible to determine causality only associations. Despite  
49 these limitations, the study included a large sample size allowing sufficient  
50 power to examine differences between men and women. Finally, an additional  
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3 strength of the methodology is the use of the gold standard PRISM which was  
4  
5 used to assess disorders.  
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### 8 9 **Implications for practice**

10 Being female does not predict the outcome of substance use treatment  
11  
12 (Greenfield *et al.*, 2007). However, comorbid psychiatric disorders and sexual  
13  
14 and physical abuse, both of which are higher among female than male  
15  
16 substance users, are associated with poorer treatment outcomes (Greenfield *et*  
17  
18 *al.*, 2002; Flynn and Brown, 2008; Boden and Moos, 2009; Magura *et al.*, 2009).  
19  
20 Treatment systems are often separated for mental health and substance abuse  
21  
22 (Saitz *et al.*, 2008). Evidence supports the integration of treatment for people  
23  
24 who use substances with co-existing psychiatric disorders (Kelly and Daley,  
25  
26 2013). While women-only treatment is not necessarily more effective than  
27  
28 mixed-gender treatment, some greater effectiveness has been demonstrated by  
29  
30 treatments that address problems more common to women or that are designed  
31  
32 for specific subgroups of this population (Greenfield *et al.*, 2009).  
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### 41 **Conclusions**

42 Our results show that psychiatric disorders are common among people who use  
43  
44 substances. Gender differences were reported for various disorders. Around 5  
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46 in 10 men and 6 in 10 women recruited from out of treatment had an Axis I non-  
47  
48 SUD psychiatric disorder, highlighting the need to increase access to both  
49  
50 substance use and mental health treatment for people who use substances,  
51  
52 especially those not in treatment. Integrated treatment should be provided to  
53  
54 address psychiatric comorbidity among people who use substances, and  
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gender specific approaches considered to improve outcomes for this population.

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## References

- Afifi, T. O., Henriksen, C. A., Asmundson, G. J. and Sareen, J. (2012), "Childhood maltreatment and substance use disorders among men and women in a nationally representative sample". *Canadian Journal of Psychiatry*, Vol. 57 No.11, pp. 677-686.
- Astals, M., Domingo-Salvany, A., Castillo, C., Tato, J., Vázquez, J.M., Martín-Santos, R. and Torrens, M. (2008), "Impact of substance dependence and dual diagnosis on the quality of life of heroin users seeking treatment". *Substance Use and Misuse*, Vol. 43 No. 5, pp. 612-632.
- Back, S. E. (2007), "Substance abuse in women: does gender matter?" *Psychiatric Times*, Vol. 24 No. 1, pp. 48.
- Boden, M. T., and Moos, R. (2009), "Dually diagnosed patients' responses to substance use disorder treatment". *Journal of Substance Abuse Treatment*, Vol. 37 No. 4, pp. 335-345.
- Choo, E.K., Benz, M., Rybarczyk, M., Broderick, K., Linden, J., Boudreaux, E.D. and Ranney, M. (2014), "The Intersecting Roles of Violence, Gender, and Substance Use in the Emergency Department: A Research Agenda". *Academic Emergency Medicine*. Vol. 21 No 12, pp. 1447–1452.
- Conner, K.R., Gamble, S.A., Bagge, C.L., He, H., Swogger, M.T., Watts, A. and Houston, R.J. (2014), "Substance-induced depression and independent depression in proximal risk for suicidal behavior". *Journal of Studies on Alcohol and Drugs*. Vol.75 No. 2, pp. 567-572.
- de la Fuente, H.L., Brugal Puig, M.T., Ballesta Gómez, R., Bravo Poetela, M.J., Barrio Anta, G., Domingo Salvany, A., Silva do Rosario, T., Ambrós Hortensi, M. (2005) "Cohort study methodology of the ITINERE Project on

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3 heroin users in three Spanish cities and main characteristics of the  
4 participants]". *Revista Espanola de Salud Pública*, Vol. 79 No. 4, pp. 475-  
5  
6  
7 491.

8  
9 DeLorenze, G.N., Tsai, A.L., Horberg, M.A. and Quesenberry, C.P. (2014),  
10  
11 "Cost of care for HIV-infected patients with co-occurring substance use  
12 disorder or psychiatric disease: report from a large, integrated health plan".  
13  
14  
15  
16  
17  
18  
19  
20  
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53  
54  
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56  
57  
58  
59  
60

*AIDS Research and Treatment*, pp. 2014: 570546.

Dolan, M. and Völlm, B. (2009), *Antisocial personality disorder and psychopathy in women: a literature review on the reliability and validity of assessment instruments. International Journal of Law and Psychiatry. Vol. 32 No. 1, pp. 2-9.*

Foulds, J.A., Douglas Sellman, J., Adamson, S.J., Boden, J.M., Mulder, R.T. and Joyce, P.R. (2015), "Depression outcome in alcohol dependent patients: an evaluation of the role of independent and substance-induced depression and other predictors." *Journal of Affective Disorders. Vol. 15 No.174, pp.503-510.*

Flynn, P.M. and Brown, B.S. (2008), "Co-occurring disorders in substance abuse treatment: Issues and prospects". *Journal of Substance Abuse Treatment. Vol. 34 No. 1, pp. 36-47.*

Gilchrist, G. and Gunn, J. (2007), "Observational studies of depression in primary care: what do we know?" *BMC Family Practice. Vol. 8:28.*

Gilchrist, G., Singleton, N., Donmalls, M. and Jones, A. (2015), "Prevalence and factors associated with sex trading in the year prior to entering treatment for drug misuse in England". *Drug and Alcohol Dependence. Vol. 152, pp. 116-122.*

1  
2  
3 Greenfield, S.F. (2002), "Women and alcohol use disorders" *Harvard Review of*  
4  
5 *Psychiatry*. Vol. 10 No. 2, pp.76-85.

6  
7 Greenfield, S.F., Brooks, A.J., Gordon, S.M., Green, C.A., Kropp, F., McHugh,  
8  
9 R.K., Lincoln, M., Hien, D. and Miele, G.M. (2007), "Substance abuse  
10  
11 treatment entry, retention, and outcome in women: a review of the  
12  
13 literature". *Drug and Alcohol Dependence*. Vol. 86 No. 1, pp. 1-21.

14  
15  
16 Greenfield, S.F. and Grella, C.E. (2009), "What is "women-focused" treatment  
17  
18 for substance use disorders?" *Psychiatric Services*. Vol. 60 No. 7, pp. 880-  
19  
20 882.

21  
22  
23 Greenberg, G.A. and Rosenheck, R.A. (2014), "Psychiatric correlates of past  
24  
25 incarceration in the national co-morbidity study replication". *Criminal*  
26  
27 *Behavior and Mental Health*. Vol. 24 No. 1, pp. 8–35.

28  
29 Hasin, D.S., Trautman, K.D. and Endicott, J. (1998), "Psychiatric Research  
30  
31 Interview for Substance and Mental Disorders: Phenomenologically based  
32  
33 diagnosis in patients who abuse alcohol or drugs". *Psychopharmacology*  
34  
35 *Bulletin*. Vol. 34 No. 1, pp. 3-8.

36  
37  
38 Hasin, D., Nunes, E. and Meydan, J. (2004), "Comorbidity of alcohol, drug, and  
39  
40 psychiatric disorders: epidemiology", in Kranzler, H.R. and Tinsley, J.A.  
41  
42 (Ed.), *Dual Diagnosis and Treatment: Substance Abuse and Comorbid*  
43  
44 *Disorders*, Marcel Dekker, New York, NY, pp. 1–34

45  
46  
47 Hasin, D., Samet, S., Nunes, E., Meydan, J., Matseoane, K. and Waxman, R.  
48  
49 (2006), "Diagnosis of comorbid psychiatric disorders in substance users  
50  
51 assessed with the Psychiatric Research Interview for Substance and  
52  
53 Mental Disorders for DSM-IV". *American Journal of Psychiatry*. Vol. 163  
54  
55 No. 4, 689-696.  
56  
57  
58  
59  
60

- 1  
2  
3 Kelly, T.M., & Daley, D.C. (2013), "Integrated treatment of substance use and  
4  
5 psychiatric disorders". *Social Work in Public Health*. Vol. 28 No. 3-4, pp.  
6  
7 388-406.  
8
- 9  
10 Kessler, R.C. (2004), "The epidemiology of dual diagnosis". *Biological*  
11  
12 *Psychiatry*. Vol. 56 No. 10, pp. 730-737.  
13
- 14 Khalsa, J.H., Treisman, G., McCance-Katz, E. and Tedaldi, E. (2008), "Medical  
15  
16 consequences of drug abuse and co-occurring infections: research at the  
17  
18 National Institute on Drug Abuse". *Substance Abuse*. Vol. 29 No. 3, pp. 5-  
19  
20 16.  
21
- 22  
23 Kingston, E.F., Marel, C. and Mills, K.L. (2016), "A systematic review of the  
24  
25 prevalence of comorbid mental health disorders in people presenting for  
26  
27 substance use treatment in Australia" *Drug and Alcohol Review*. DOI:  
28  
29 10.1111/dar.12448  
30
- 31  
32 Krausz, R.M., Clarkson, A.F., Strehlau, V., Torchalla, I., Li, K. and Schuetz,  
33  
34 C.G. (2013), "Mental disorder, service use, and barriers to care among 500  
35  
36 homeless people in 3 different urban settings". *Social Psychiatry and*  
37  
38 *Psychiatric Epidemiology*. Vol. 48 No. 8, pp. 1235–1243.  
39
- 40  
41 Langås, A.M., Malt, U.F. and Opjordsmoen, S. (2013), "Independent versus  
42  
43 substance-induced major depressive disorders in first-admission patients  
44  
45 with substance use disorders: an exploratory study". *Journal of Affective*  
46  
47 *Disorders*. Vol. 144 No. 3, pp. 279-283.  
48
- 49  
50 Lewis, K.L. and Grenyer, B.F. (2009), "Borderline personality or complex  
51  
52 posttraumatic stress disorder? An update on the controversy". *Harvard*  
53  
54 *Review of Psychiatry*. Vol. 17 No. 5, pp. 322-328.  
55  
56  
57  
58  
59  
60

1  
2  
3 Magura, S., Lee, J.D., Hershberger, J., Joseph, H., Marsch, L., Shropshire, C.  
4  
5 and Rosenblum, A. (2009), "Buprenorphine and methadone maintenance  
6  
7 in jail and post-release: a randomized clinical trial". *Drug and Alcohol*  
8  
9 *Dependence*. Vol. 99 No. 1, pp. 222-230.

10  
11 Martín-Santos, R., Torrens, M., Poudevida, S., Langhor, K., Cuyas, E., Pacific,  
12  
13 R., Farré, M., Pichini, S. and de la Torre Fornell, R. (2010), "5-HTTLPR  
14  
15 polymorphism, mood disorders and MDMA use in a 3-year follow-up  
16  
17 study". *Addiction Biology*. Vol. 15 No. 1, pp. 15-22.

18  
19 Martin-Santos, R., Egmond, E., Caverro, M., Mariño, Z., Subira, S., Navines,  
20  
21 R., Forns, X. and Valdes, M. (2015), "Chronic hepatitis C, depression  
22  
23 and gender: a state of art". *Advances in Dual Diagnosis*. Vol. 8 No. 4,  
24  
25 pp. 193-210.

26  
27 Morgello, S., Holzer, C.E., Ryan, E., Young, C., Naseer, M., Castellon, S.A.,  
28  
29 Frol, A.B., Hampton-Atkinson, J., Gelman, B.B., Grant, I. and Singer, E.J.  
30  
31 (2006), "Interrater reliability of the Psychiatric Research Interview for  
32  
33 Substance and Mental Disorders in an HIV-infected cohort: experience of  
34  
35 the National NeuroAIDS Tissue Consortium". *International Journal of*  
36  
37 *Methods in Psychiatry Research*. Vol. 15 No. 3, pp. 131-138.

38  
39 Niciu, M.J., Chan, G., Gelernter, J., Arias, A.J., Douglas, K., Weiss, R., Anton,  
40  
41 R.F., Farrer, L., Cubells, J.F. and Kranzler, H.R. (2009) "Subtypes of major  
42  
43 depression in substance dependence". *Addiction*. Vol. 104 No. 10, pp.  
44  
45 1700–1709.

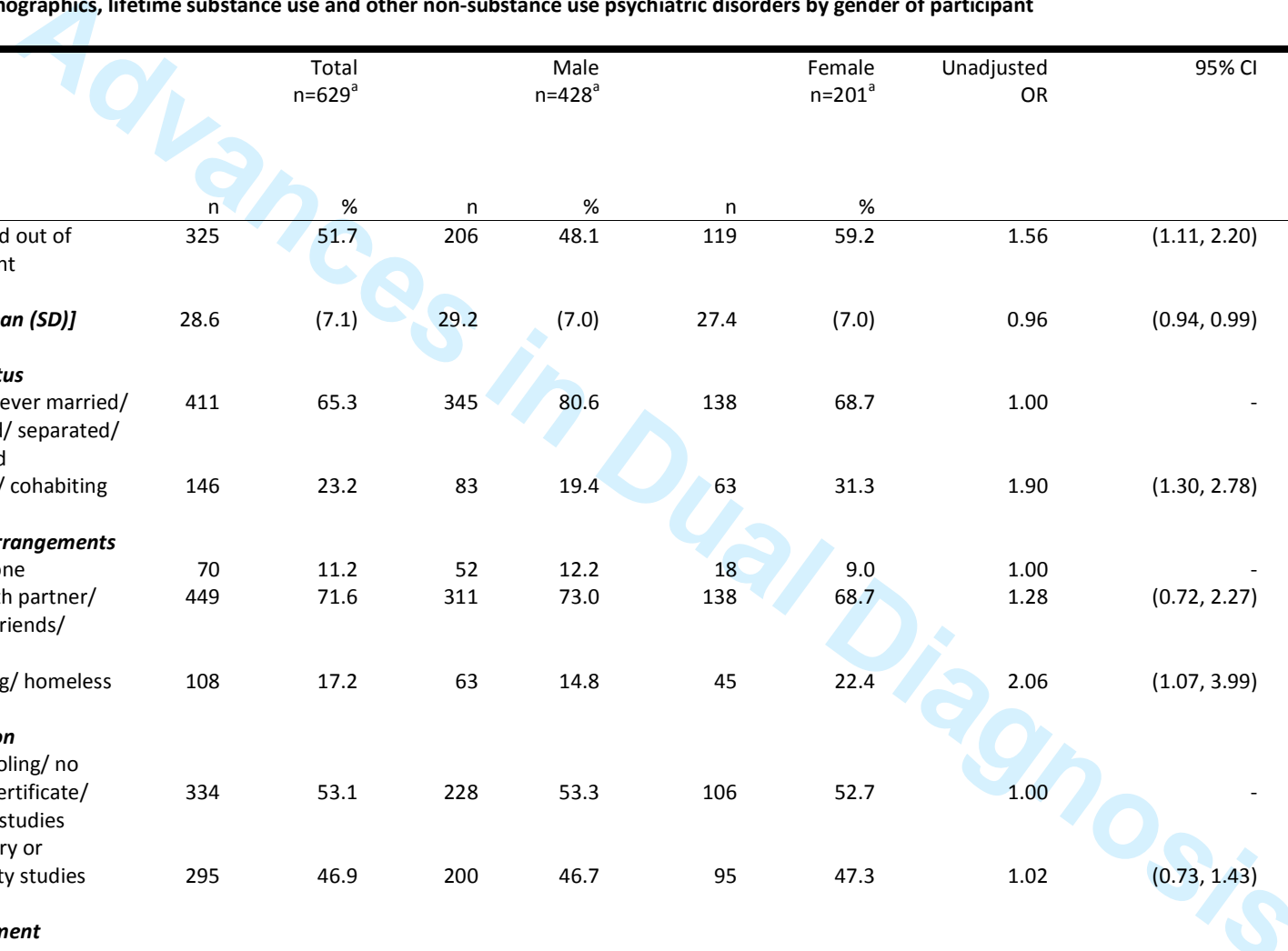
46  
47 Nocon, A., Berge, D., Astals, M., Martín-Santos, R. and Torrens, M. (2007),  
48  
49 "Dual diagnosis in an inpatient drug-abuse detoxification unit". *European*  
50  
51 *Addiction Research*. Vol. 13 No. 4, pp. 192-200.

- 1  
2  
3 Prins, S.J. (2014), "Prevalence of mental illnesses in U.S. state prisons: A  
4  
5 systematic review". *Psychiatric Services*. Vol. 65 No. 7, pp. 862–872.  
6  
7 Pulido, J., Brugal, M.T., de la Fuente, L., Ballesta, R., Barrio, G., Bravo,  
8  
9 M.J., Domingo-Salvany, A., Castellano, Y. and Fernández, F. (2009),  
10  
11 "[Recruitment methodology and characteristics of a cohort of young  
12  
13 regular cocaine users in three Spanish cities (the Itinere-cocaine  
14  
15 Project)]". *Gaceta Sanitaria*. Vol. 23 No. 3, pp. 200-207.  
16  
17  
18 Saitz, R., Larson, M. J., LaBelle, C., Richardson, J. and Samet, J.H. (2008),  
19  
20 "The case for chronic disease management for addiction". *Journal of*  
21  
22 *Addiction Medicine*. Vol. 2 No. 2, 55-65.  
23  
24  
25 Samet, S., Fenton, M.C., Nunes, E., Greenstein, E., Aharonovich, E. and Hasin,  
26  
27 D. (2013), "Effects of independent and substance-induced major  
28  
29 depressive disorder on remission and relapse of alcohol, cocaine and  
30  
31 heroin dependence". *Addiction*. Vol. 108 No. 1, pp. 115-123.  
32  
33  
34 Schuckit, M.A., Smith, T.L., Danko, G.P., Pierson, J., Trim, R., Nurnberger, J.I.,  
35  
36 Kramer, J., Kuperman, S., Bierut, L.J. and Hesselbrock, V. (2007), "A  
37  
38 comparison of factors associated with substance-induced versus  
39  
40 independent depressions". *Journal of Studies on Alcohol and Drugs*. Vol.  
41  
42 68 No. 6, pp. 805–812.  
43  
44  
45 Sordo, L., Chahua, M., Bravo, M.J., Barrio, G., Brugal, M.T., Domingo-Salvany,  
46  
47 A., Molist, G. and De la Fuente, L. (2012), "Depression among regular  
48  
49 heroin users: the influence of gender". *Addictive Behaviors*. Vol. 37 No. 1,  
50  
51 pp. 148-152.  
52  
53  
54  
55  
56  
57  
58  
59  
60

- 1  
2  
3 Trevillion, K., Oram, S., Feder, G. and Howard, L.M. (2012), "Experiences of  
4  
5 Domestic Violence and Mental Disorders: A Systematic Review and Meta-  
6  
7 Analysis". *PLoS ONE*. Vol. 7 No. 12, e51740.  
8
- 9  
10 Torrens, M., Serrano, D., Astals, M., Pérez-Domínguez, G. and Martín-Santos,  
11  
12 R. (2004), "Diagnosing comorbid psychiatric disorders in substance  
13  
14 abusers: Validity of the Spanish versions of the psychiatric research  
15  
16 interview for substance and mental disorders and the structured clinical  
17  
18 interview for DSM-IV". *American Journal of Psychiatry*. Vol. 161 No. 7, pp.  
19  
20 1231-1237.  
21
- 22  
23 Torrens, M., Gilchrist, G. and Domingo-Salvany, A. (2011), "Psychiatric  
24  
25 comorbidity in illicit drug users: substance-induced versus independent  
26  
27 disorders. *Drug and Alcohol Dependence*. Vol. 113 No. 2-3, pp. 147-156.  
28
- 29  
30 Torrens, M., Mestre-Pintó, J. and Domingo-Salvany, A. (2015), "*Comorbidity of*  
31  
32 *substance use and mental disorders in Europe*". European Monitoring  
33  
34 Centre for Drugs and Drug Addiction, Luxembourg.  
35
- 36  
37 Verona, E., Murphy, B. and Javdani, S. (2015), "Gendered Pathways: Violent  
38  
39 Childhood Maltreatment, Sex Exchange, and Drug Use". *Psychology of*  
40  
41 *Violence*. pii: a0039126.  
42
- 43  
44 Whiteford, H.A., Degenhardt, L., Rehm, J., Baxter, A.J., Ferrari, A.J., Erskine,  
45  
46 H.E., Charlson, F.J., Norman, R.E., Flaxman, A.D., Johns, N., Burstein, R.,  
47  
48 Murray, C.J. and Vos, T. (2013), "Global burden of disease attributable to  
49  
50 mental and substance use disorders: findings from the Global Burden of  
51  
52 Disease Study 2010". *Lancet*. Vol. 382 No. 9904, pp.1575-1586.  
53  
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Table 1. Demographics, lifetime substance use and other non-substance use psychiatric disorders by gender of participant

	Total n=629 <sup>a</sup>		Male n=428 <sup>a</sup>		Female n=201 <sup>a</sup>		Unadjusted OR	95% CI	Adjusted OR for study <sup>(1-5)</sup> & age	95% CI
	n	%	n	%	n	%				
Recruited out of treatment	325	51.7	206	48.1	119	59.2	1.56	(1.11, 2.20)	1.24	(0.81, 1.90)
<b>Age [mean (SD)]</b>	28.6	(7.1)	29.2	(7.0)	27.4	(7.0)	0.96	(0.94, 0.99)	0.98	(0.95, 1.01)
<b>Civil status</b>										
Single/Never married/ Divorced/ separated/ widowed	411	65.3	345	80.6	138	68.7	1.00	-	1.00	-
Married/ cohabiting	146	23.2	83	19.4	63	31.3	1.90	(1.30, 2.78)	2.31	(1.55, 3.45)
<b>Living arrangements</b>										
Lives Alone	70	11.2	52	12.2	18	9.0	1.00	-	1.00	-
Lives with partner/ family/ friends/ flatmate	449	71.6	311	73.0	138	68.7	1.28	(0.72, 2.27)	1.09	(0.60, 1.95)
Squatting/ homeless	108	17.2	63	14.8	45	22.4	2.06	(1.07, 3.99)	1.56	(0.79, 3.10)
<b>Education</b>										
No schooling/ no school certificate/ primary studies	334	53.1	228	53.3	106	52.7	1.00	-	1.00	-
Secondary or University studies	295	46.9	200	46.7	95	47.3	1.02	(0.73, 1.43)	0.95	(0.65, 1.35)
<b>Employment</b>										
Not working or Studying	335	53.5	216	50.7	119	59.5	1.00	-	1.00	-



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	Total n=629 <sup>a</sup>		Male n=428 <sup>a</sup>		Female n=201 <sup>a</sup>		Unadjusted OR	95% CI	Adjusted OR for study <sup>(1-5)</sup> & age	95% CI
	n	%	n	%	n	%				
Working or studying	291	46.5	210	49.3	81	40.5	0.70	(0.50, 0.98)	0.69	(0.49, 0.98)
Ever imprisoned	417	70.4	268	62.8	87	43.5	0.46	(0.33, 0.64)	0.47	(0.32, 0.69)
<b>Age first used [mean (SD)]<sup>b-d</sup></b>										
Cannabis	15.6	(3.1)	15.4	(3.1)	15.9	(2.9)	1.05	(0.97, 1.11)	1.09	(1.03, 1.16)
Heroin	19.8	(5.2)	19.8	(5.0)	19.9	(5.6)	1.00	(0.97, 1.04)	1.04	(0.99, 1.08)
Alcohol	15.0	(3.1)	14.9	(3.2)	15.4	(2.9)	1.00	(0.95, 1.07)	1.00	(0.93, 1.06)
Cocaine	18.7	(4.9)	18.9	(5.1)	18.2	(4.4)	0.97	(0.93, 1.00)	1.01	(0.96, 1.05)
Hallucinogen	18.1	(3.6)	18.1	(3.4)	18.3	(4.3)	1.01	(0.92, 1.12)	1.04	(0.93, 1.15)
Injected in lifetime	627	99.7	255	59.9	106	52.7	0.75	(0.53, 1.05)	0.97	(0.66, 1.43)
HIV	588	93.5	79	19.5	36	19.8	1.02	(0.66, 1.58)	1.23	(0.78, 1.95)
Hepatitis C	264	45.3	193	48.0	71	39.2	0.70	(0.49, 0.999)	0.85	(0.58, 1.25)
<b>Lifetime substance abuse or dependence disorders (SUD)<sup>g</sup></b>										
Any SUD	589	93.6	409	95.6	180	89.6	0.40	(0.21, 0.76)	0.54	(0.27, 1.10)
Poly SUD <sup>e</sup>	528	83.9	373	87.1	155	77.1	0.50	(0.32, 0.77)	0.55	(0.34, 0.88)
Opiates <sup>f</sup>	450	71.5	317	74.1	133	66.2	0.69	(0.48, 0.99)	1.57	(0.71, 3.48)
Cocaine	476	75.7	330	77.1	146	72.6	0.79	(0.54, 1.16)	0.82	(0.55, 1.24)
Stimulant	209	33.2	145	33.9	64	31.8	0.91	(0.64, 1.30)	0.84	(0.58, 1.23)
Hallucinogen	143	22.7	103	24.1	40	19.9	0.65	(0.42, 1.00)	0.78	(0.52, 1.18)
Cannabis	331	52.6	252	58.9	79	39.3	0.45	(0.32, 0.64)	0.46	(0.32, 0.65)
Sedatives	201	32.2	132	30.8	69	34.3	1.17	(0.82, 1.67)	1.41	(0.93, 2.12)
Alcohol	305	48.5	223	52.1	82	40.8	0.63	(0.45, 0.89)	0.61	(0.42, 0.86)

	Total n=629 <sup>a</sup>		Male n=428 <sup>a</sup>		Female n=201 <sup>a</sup>		Unadjusted OR	95% CI	Adjusted OR for study <sup>(1-5)</sup> & age	95% CI
	n	%	n	%	n	%				
Number SUD <sup>b</sup> [mean (SD)]	3.4	(1.9)	3.6	(1.8)	3.1	(1.9)	0.87	(0.79, 0.95)	0.86	(0.78, 0.96)
<b>Psychiatric non-SUD disorders<sup>b</sup></b>										
Any Axis 1 psychiatric (Non-SUD) disorder	263	41.8	154	36.0	109	54.2	2.11	(1.50, 2.96)	2.09	(1.48, 2.96)
Any substance induced disorder	95	15.1	58	13.6	37	18.4	1.44	(0.92, 2.26)	1.34	(0.85, 2.12)
<b>Any mood disorder</b>	170	27.0	94	22.0	76	37.8	2.16	(1.50, 3.11)	2.13	(1.46, 3.11)
Dysthymia	11	1.7	8	1.9	3	1.5	0.79	(0.21, 3.03)	1.12	(0.20, 6.24)
Major depressive disorder	107	17.0	55	12.9	52	25.9	2.37	(1.55, 3.62)	2.42	(1.57, 3.72)
Hipomania	1	0.2	1	0.2	0	0	-	-	-	-
Substance induced affective disorder	63	10.0	39	9.1	24	11.9	1.35	(0.79, 2.32)	1.27	(0.73, 2.21)
<b>Any anxiety disorder</b>	97	15.4	55	12.9	42	20.9	1.79	(1.15, 2.79)	1.86	(1.19, 2.92)
General anxiety	3	0.5	1	0.2	2	1.0	4.29	(0.39, 47.61)	3.80	(0.34, 42.19)

Advances in Dual Diagnosis

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	Total n=629 <sup>a</sup>		Male n=428 <sup>a</sup>		Female n=201 <sup>a</sup>		Unadjusted OR	95% CI	Adjusted OR for study <sup>(1-5)</sup> & age	95% CI
	n	%	n	%	n	%				
disorder										
Specific phobia	25	4.0	9	2.1	16	8.5	4.30	(1.88, 9.83)	4.73	(2.05, 10.96)
Social phobia	21	3.3	19	4.4	5	2.5	0.55	(0.20, 1.49)	0.61	(0.22, 1.67)
Panic disorder	32	5.1	19	4.4	13	6.5	1.49	(0.72, 3.08)	1.58	(0.76, 3.31)
Obsessive compulsive	7	1.1	7	1.6	0	0	-	-	-	-
PTSD	19	3.0	7	1.6	12	6.0	3.82	(1.48, 9.85)	4.31	(1.65, 11.28)
Substance induced anxiety disorder	7	1.1	5	1.2	2	1.0	-			
<b>Any psychotic disorder</b>	44	7.0	30	7.0	14	7.0	0.99	(0.52, 1.92)	1.05	(0.54, 2.06)
Schizophrenia	11	1.7	10	2.3	1	0.5	0.21	(0.03, 1.64)	0.23	(0.03, 1.85)
Schizoaffective	1	0.2	1	0.2	0	0	-	-	-	-
Lifetime Psychotic disorder	13	2.1	12	2.8	1	0.5	-	-	-	-
Substanced induced psychotic disorder	31	4.9	18	4.2	13	6.5	1.57	(0.76, 3.28)	1.53	(0.73, 3.21)
<b>Attention deficit disorder</b>	50	7.9	41	9.6	9	4.5	0.44	(0.21, 0.93)	0.37	(0.17, 0.78)
<b>Any eating disorder</b>	33	5.2	13	3.0	20	10.0	3.53	(1.72, 7.25)	3.01	(1.45, 6.25)
Anorexia	10	1.6	2	0.5	8	4	8.83	(1.86, 41.97)	8.58	(1.77, 41.54)
Bulimia	13	2.1	2	0.5	11	5.5	12.33	(2.71, 56.17)	10.35	(2.25, 47.58)

	Total n=629 <sup>a</sup>		Male n=428 <sup>a</sup>		Female n=201 <sup>a</sup>		Unadjusted OR	95% CI	Adjusted OR for study <sup>(1-5)</sup> & age	95% CI
	n	%	n	%	n	%				
Eating disorder NOS <sup>h</sup>	14	2.2	10	2.3	4	2.0	0.85	(0.26, 2.74)	0.66	(0.20, 2.20)
<b>Antisocial or borderline personality disorder</b>	144	22.9	101	23.6	43	21.4	0.88	(0.59, 1.32)	0.84	(0.55, 1.29)
Antisocial	104	16.5	79	18.5	25	12.4	0.63	(0.39, 1.02)	0.59	(0.36, 0.96)
Borderline	67	10.7	34	7.9	33	16.4	2.28	(1.36, 3.80)	2.29	(1.37, 3.84)

**Footnotes**

**Extremely low cell count for some variables precluded statistical analysis.**

<sup>1</sup> Nocon A, Berge D, Astals M, Martín-Santosa R, Torrens M. Dual diagnosis in an inpatient drug-abuse detoxification unit. *Eur Addict Res.* 2007,13(4):192-200.

<sup>2</sup> Astals M, Domingo-Salvany A, Castillo C, Tato J, Vázquez JM, Martín-Santos R, Torrens M. Impact of substance dependence and dual diagnosis on the quality of life of heroin users seeking treatment. *Subst Use Misuse.* 2008,43(5):612-632.

<sup>3</sup> Rodríguez-Llera MC, Domingo-Salvany A, Brugal MT, Silva TC, Sánchez-Niubó A, Torrens M, ITINERE Investigators. Psychiatric comorbidity in young heroin users *Drug Alcohol Depend.* 2006,84(1):48-55

<sup>4</sup> Herrero MJ, Domingo-Salvany A, Torrens M, Brugal MT. the ITINERE Investigators. Psychiatric comorbidity in young cocaine users: induced versus independent disorders. *Addiction.* 2008,103(2):284-293.

<sup>5</sup> Martín-Santos R, Torrens M, Poudevida S, Langhor K, Cuyas E, Pacific R, Farré M, Pichini S, de la Torre Fornell R. 5-HTTLPR polymorphism, mood disorders and MDMA use in a 3-year follow-up study. *Addict Biol.* 2010,15:15-22.

<sup>a</sup> Discrepancies in totals due to missing responses

<sup>b</sup> For young heroin and young cocaine users, the age of first alcohol and cannabis use was calculated from the youngest age of the following two variables: age began chronic use (i.e. ≥ 4 days a week during a month for cannabis, and ≥ 5 drinks per day for ≥ 4 days a week during a month for alcohol) and age began using most of the day for 3 consecutive days for cannabis, and using ≥ 5 drinks for 3 consecutive days for alcohol

<sup>c</sup> With the exception of Ecstasy users and inpatient detoxification patients where age of first use of any substance was calculated, age of habitual use refers to the youngest age of the following two variables: age began chronic use (i.e. ≥ 4 days a week during a month for drugs, and ≥ 5 drinks per day for ≥ 4 days a week during a month for alcohol) and age began using most of the day for 3 consecutive days for drugs, and using ≥ 5 drinks for 3 consecutive days for alcohol

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<sup>d</sup> Any substance abuse or dependence includes heroin, methadone and other opiates (analgesics), cocaine, stimulants, hallucinogens, cannabis, sedatives, alcohol and other drugs

<sup>e</sup> Poly substance abuse/dependence is abuse/dependence of more than one substance

<sup>f</sup> Any opiate abuse or dependence includes heroin, methadone and other opiates (analgesics)

<sup>g</sup> SUD: Substance use (abuse or dependence) disorder/s

<sup>h</sup> NOS: Not otherwise specified



**Table 2. Factors associated with Lifetime Axis I Non Substance Use Disorder (non-SUD) among females who use substances**

	No lifetime Axis 1 non SUD	Lifetime Axis 1 non SUD	Unadjusted OR and 95% CI	OR and 95% CI Adjusted for age and study
<b>Demographics</b>				
<i>Marital status</i>				
Single/Never married/ Divorced/Separated/Widowed	72.8%	65.1%	1.00	1.00
Married/Cohabiting	27.2%	24.9%	0.70 (0.28, 1.28)	0.71 (0.38, 1.31)
<i>Highest level of education attained</i>				
Secondary school or university studies (versus no or primary schooling)	46.7%	47.7%	1.04 (0.60, 1.81)	1.06 (0.59, 1.88)
<i>Employment</i>				
Working or studying	42.4%	38.9%	0.86 (0.49, 1.52)	0.86 (0.48, 1.55)
<i>Criminal history</i>				
Ever in prison	33.0%	52.3%	2.23 (1.25, 3.97)	2.57 (1.35, 4.86)
<i>Living arrangements</i>				
Lives alone	5.4%	11.9%	1.00	1.00
Flatmate/family	72.8%	65.1%	0.41 (0.14, 1.21)	0.41 (0.14, 1.21)
Squatting/homeless	21.8%	22.9%	0.48 (0.15, 1.58)	0.50 (0.15, 1.68)
<i>Blood borne virus status</i>				
HIV	17.3%	21.8%	1.33 (0.63, 2.81)	1.36 (0.62, 2.96)
Hepatitis C	28.4%	48.0%	2.33 (1.24, 4.34)	3.05 (1.48, 6.29)
<i>Recruited from out of treatment settings</i>	58.7%	59.6%	1.04 (0.59, 1.83)	1.99 (0.58, 6.80)

**Table 3. Factors associated with Lifetime Axis I Non Substance Use Disorder (non-SUD) among males who use substances**

	No lifetime Axis 1 non SUD	Lifetime Axis 1 non SUD	Unadjusted OR and 95% CI	OR and 95% CI Adjusted for age and study
<i>Marital status</i>				
Single/Never married/ Divorced/Separated/Widowed	78.1%	85.1%	1.00	1.00
Married/Cohabiting	21.9%	14.9%	1.60 (0.94, 2.71)	1.56 (0.90, 2.57)
<i>Highest level of education attained</i>				
Secondary school or university studies (versus no or primary schooling)	50.0%	40.9%	0.69 (0.46, 1.03)	0.63 (0.42, 0.95)
<i>Employment</i>				
Working or studying	52.9%	42.8%	0.66 (0.45, 0.99)	0.67 (0.45, 1.01)
<i>Criminal history</i>				
Ever in prison	60.4%	66.9%	1.32 (0.87, 2.00)	1.51 (0.98, 2.34)
<i>Living arrangements</i>				
Lives alone	12.4%	11.8%	1.00	1.00
Flatmate/family	74.5%	70.4%	0.99 (0.53, 1.84)	0.85 (0.50, 1.80)
Squatting/ homeless	13.1%	17.7%	1.42 (0.66, 3.03)	1.32 (0.59, 2.92)
<i>Blood borne virus status</i>				
HIV	21.2%	16.3%	0.72 (0.43, 1.23)	0.75 (0.44, 1.29)
Hepatitis C	46.1%	51.4%	1.23 (0.82, 1.86)	1.40 (0.91, 2.17)
<i>Recruited from out of treatment settings</i>	46.4%	51.3%	1.22 (0.82, 1.81)	0.79 (0.32, 1.94)

**Table 4. Associations between specific Lifetime Substance Use Disorders and Non Substance Use Disorder among females who use substances**

Lifetime substance use disorders OR (95%CI)	Lifetime (non-substance use) psychiatric disorders OR (95%CI)					
	Mood	Anxiety	Eating	Psychotic	Antisocial and/or borderline personality	Any substance induced
Alcohol	1.84 (1.03, 3.29)	1.82 (0.92, 3.60)	1.21 (0.48, 3.07)	1.10 (0.37, 3.28)	1.71 (0.87, 3.37)	2.92 (1.40, 6.11)
Opiates	1.58 (0.85, 2.93)	1.58 (0.74, 3.37)	0.59 (0.23, 1.50)	7.26 (0.93, 56.71)	2.68 (1.17, 6.16)	1.75 (0.77, 3.95)
Cocaine	1.36 (0.71, 2.60)	2.67 (1.06, 6.76)	2.28 (0.64, 8.13)	5.28 (0.67, 41.35)	10.34 (2.41, 44.43)	2.81 (1.03, 7.63)
Sedatives	1.44 (0.79, 2.61)	1.40 (0.70, 2.82)	0.45 (0.14, 1.39)	3.81 (1.22, 11.86)	1.93 (0.97, 3.85)	1.93 (0.89, 3.78)
Stimulants	1.31 (0.71, 2.40)	1.62 (0.80, 3.28)	2.35 (0.93, 5.98)	3.12 (1.03, 9.41)	1.54 (0.77, 3.11)	2.12 (1.02, 4.39)
Cannabis	1.32 (0.74, 2.36)	1.06 (0.53, 2.13)	1.62 (0.64, 4.10)	3.01 (0.97, 9.34)	4.47 (2.18, 9.20)	3.66 (1.73, 7.74)
Hallucinogens	2.13 (1.06, 4.29)	2.19 (1.01, 4.75)	3.10 (1.17, 8.21)	0.65 (0.14, 3.05)	1.80 (0.82, 3.93)	2.75 (1.25, 6.06)
Poly substance	1.52 (0.75, 3.09)	2.57 (0.95, 6.98)	0.88 (0.30, 2.56)	-	7.91 (1.83, 34.11)	6.42 (1.48, 7.80)

**Footnote: Extremely low cell count for some variables precluded statistical analysis.**

**Table 5. Associations between specific Lifetime Substance Use Disorders and Non Substance Use Disorder among males who use substances**

Lifetime substance use disorders OR (95%CI)	Lifetime (non-substance use) psychiatric disorders OR (95%CI)					
	Mood	Anxiety	Eating	Psychotic	Antisocial and/or borderline personality	Any substance induced
Alcohol	1.32 (0.83, 2.10)	1.22 (0.69, 2.15)	2.11 (0.64, 6.97)	2.70 (1.17, 6.20)	2.89 (1.77, 4.69)	1.60 (0.91, 2.83)
Opiates	0.73 (0.44, 1.21)	1.03 (0.54, 1.97)	0.78 (0.24, 2.59)	1.82 (0.68, 4.86)	2.18(1.21, 3.91)	0.82 (0.45, 1.51)
Cocaine	2.13 (1.13, 4.02)	0.95 (0.49, 1.86)	0.99 (0.27, 3.67)	1.53 (0.57, 4.09)	3.35 (1.67, 6.73)	4.60 (1.62, 13.04)
Sedatives	1.07 (0.65, 1.74)	1.74 (0.97, 3.11)	1.00 (0.30, 3.30)	0.96 (0.43, 2.15)	3.88 (2.43, 6.20)	1.57 (0.89, 2.79)
Stimulants	1.21 (0.75, 1.95)	1.91 (1.08, 3.39)	3.25 (1.04, 10.11)	0.83 (0.37, 1.85)	3.33 (2.10, 5.28)	1.71 (0.98, 3.01)
Cannabis	1.38 (0.86, 2.23)	1.83 (0.99, 3.39)	0.81 (0.27, 2.45)	0.59 (0.28, 1.24)	1.91 (1.18, 3.08)	1.39 (0.78, 2.47)
Hallucinogens	1.57 (0.94, 2.61)	1.49 (0.80, 2.78)	3.88 (1.27, 11.81)	0.78 (0.31, 1.95)	2.58 (1.59, 4.20)	2.38 (1.33, 4.26)
Poly substance	4.06 (1.43, 11.53)	2.02 (0.70, 5.83)	1.80 (0.23, 14.08)	4.55 (0.61, 34.11)	19.78 (2.70, 144.88)	-

**Footnote: Extremely low cell count for some variables precluded statistical analysis.**