

Bipolar disorder and substance use disorders. Madrid study on the prevalence of dual disorders/pathology

Trastorno bipolar y trastorno por uso de sustancias. Estudio Madrid sobre prevalencia de patología dual

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Abstract

Given its prevalence and impact on public health, the comorbidity of bipolar and substance use disorders is one of the most relevant of dual diagnoses. The objective was to evaluate the characteristics of patients from community mental health and substance abuse centres in Madrid. The sample consisted of 837 outpatients from mental health and substance abuse centres. We used the Mini International Neuropsychiatric Interview (MINI) and Personality Disorder Questionnaire (PDQ4+) to evaluate axis I and II disorders. Of these patients, 174 had a lifetime bipolar disorder, 83 had bipolar disorder type I and 91 had type II. Most patients had dual pathology. Of the 208 participants from the mental health centres, 21 had bipolar disorder and 13 (61.9%) were considered dually-diagnosed patients, while 33.2% of non-bipolar patients had a dual diagnoses ($p = 0.03$). Of the 629 participants from the substance abuse centres, 153 patients (24.3%) had a bipolar diagnosis. Bipolar dual patients had higher rates of alcohol and cocaine dependence than non-bipolar patients. Moreover, age at onset of alcohol use was earlier in bipolar dually-diagnosed patients than in other alcoholics. Bipolar dually-diagnosed patients had higher personality and anxiety disorder comorbidities and greater suicide risk. Thus, alcohol and cocaine are the drugs most associated with bipolar disorder. Given the nature of the study, the type of relationship between these disorders cannot be determined.

Keywords: Dual diagnosis, prevalence, bipolar disorder, alcohol, cocaine, cannabis, opioids.

Resumen

La comorbilidad entre trastorno bipolar y trastorno por uso de sustancias (TUS) es de las más relevantes dentro del espectro de la patología dual por su prevalencia y sus repercusiones evolutivas y sociosanitarias. Nuestro objetivo fue estudiar las características de los pacientes con diagnóstico de trastorno bipolar y trastorno por uso de sustancias procedentes del Estudio Madrid sobre prevalencia de patología dual en sujetos en tratamiento en el servicio sanitario público. La muestra procede de pacientes en tratamiento en las redes públicas de salud mental y de tratamiento para las adicciones de la Comunidad de Madrid. Los sujetos fueron evaluados con la entrevista Mini International Neuropsychiatric Interview (MINI) para el diagnóstico de los trastornos mentales y con la escala Personality Disorder Questionnaire (PDQ) para el diagnóstico de los trastornos de personalidad. De los 837 pacientes incluidos, 174 tenían un diagnóstico a lo largo de la vida de trastorno bipolar, 83 con trastorno bipolar tipo I y 91 del tipo II. La mayoría de ellos tenían algún diagnóstico de TUS. En la red de salud mental, de los 208 participantes, 21 tenían un diagnóstico de trastorno bipolar, de estos el 13 (61.9%) tenían un diagnóstico de TUS y se consideraron duales, mientras que en el resto de los pacientes de salud mental el 33.2% tenían un diagnóstico comórbido de TUS ($p = 0.03$). En los centros de drogas, de los 629 pacientes valorados, un 24.3% ($n = 153$) tenían un diagnóstico de trastorno bipolar. El subgrupo de pacientes con trastorno bipolar tenía mayor prevalencia de adicción al alcohol y a la cocaína que el resto de los pacientes. Además, la edad de inicio en el consumo de alcohol era más precoz entre los adictos bipolares que entre los adictos no bipolares. Los bipolares duales era un subgrupo con mayor comorbilidad con trastornos de personalidad, otros trastornos mentales como trastornos de ansiedad y mayor riesgo de suicidio. Estos datos apoyan que el alcohol principalmente y la cocaína son las drogas más relacionadas con la presencia de un trastorno bipolar, pero al ser un estudio transversal no se pueden extraer conclusiones etiológicas.

Palabras clave: Patología dual, prevalencia, trastorno bipolar, alcohol, cocaína, cannabis, opiáceos.

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Dual diagnosis is defined as the presence of an addiction disorder and a lifetime mental disorder. Important epidemiological studies of both the general population (Kessler, Nelson, McGonagle, Edlund, Frank & Leaf, 1996; Regier et al., 1990) and of clinical samples (Weaver et al., 2003) highlight that this concurrence is common. Comorbidity affects both clinical presentation and outcome, impacts the therapeutic approach due to less scientific evidence on the most suitable treatment, and is associated with lower adherence to treatment, higher use of health services and greater functional impairment (González-Pinto et al., 2006; González-Pinto, Reed, Novick, Bertsch & Haro, 2010; Lagerberg et al., 2010).

In the Epidemiologic Catchment Area (ECA) study of the general population, the axis I mental disorder most associated with drug use was bipolar disorder (Regier et al., 1990), confirmed by other studies of the general population, such as the National Comorbidity Survey (NCS) or the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) and subsequent clinical studies (Kessler, Rubinow, Holmes, Abelson & Zhao, 1997; Grant et al., 2005; Merikangas et al., 2007; Cassidy, Ahearn, Carroll, 2001; Simon et al., 2004). Different explanations may account for this high prevalence, such as the self-medication hypothesis, shared vulnerability factors or substance use as a risk factor (Levin & Hennessy, 2004). Differences in reward processing have been described as impacting vulnerability to addiction (Singh et al., 2013). Clinical factors have also been considered, as patients show higher use during manic episodes, possibly in relation to these patients' search for pleasure and their disinhibited and impulsive conduct characteristic of a manic episode, while they show lesser use during depressive episodes (Levin & Hennessy, 2004; Trost et al., 2014). Greater impulsivity is considered characteristic of bipolar disorders (Powers et al., 2013). Therefore, it is convenient to study the prevalence of lifetime and current addictions among this group, given that these can be quite variable, depending on the patient's clinical status (McElroy et al., 2001). It is possible that the abovementioned explanatory models are not mutually exclusive, due to the existence of data supporting the different hypotheses and the applicability of different explanations to a given patient.

In general, results show that bipolar patients have higher substance use for all substances, but some drugs may have differential effects on emotional regulation and may be more related to provoking changes in these patients' mood; these patients may be more likely to use these due to possible positive short-term effects on their mood (Merikangas et al., 2008). However, it is unclear whether bipolar patients have a preference for certain drugs, or whether there is a higher prevalence of certain addictions, or whether changes exist in usage patterns depending on one's emotional state.

The purpose of this study was to evaluate the relationship between drug dependency and bipolar disorder diagnosis in a sample of outpatients receiving treatment through the mental health and drug abuse network of the Community of Madrid, as part of study on the prevalence of dual diagnosis in this Community, described in other articles (Arias et al., 2013a).

Methodology

Sample

Patients were selected consecutively by their own therapists at the Drug Addiction Treatment Centres (DATCs) of the Community of Madrid and the Madrid City Council and in the Mental Health Centres (MHCs) of the Community of Madrid. Therefore, both first-time patients and returning patients seeking treatment were included. Participants were comprised of 81 interviewers (psychiatrists, psychologists or general practitioners broadly experienced with addictions) from 64 drug treatment centres and 17 mental health centres from the Community of Madrid. All interviewers underwent training on the administration of the structured interview. Participants signed an informed consent form. The Ethical Research Committee of the Gregorio Marañón Hospital in Madrid approved the study. The participation percentage was 87.2%.

Methods

The structured Mini International Neuropsychiatric Interview (MINI) was used to detect the presence of mental disorders, enabling diagnosis in accordance with DSM-IV and CIE-10 criteria (Sheehan et al., 1997). This interview allows for exploring the main axis I current and lifetime psychiatric disorders. It is comparable with longer interviews, such as the SCID-I and the CIDI, with acceptably high degrees of validity and reliability, yet requires less time to complete and briefer training periods for clinical interviewers (Sheehan et al., 1998; Amorim, Lecrubier, Weiller, Hergueta & Sheehan, 1998; Lecrubier et al., 1997). Lifetime mental disorders that were not evaluated by this instrument were explored during the clinical interview. Bipolar disorder type I was established if the MINI interview met requirements of at least one manic episode currently or in the past, and bipolar disorder type II was established if requirements were met of at least one current or past hypomanic episode and major depressive disorder but without meeting criteria of manic episodes.

The PDQ4+ (Personality Disorder Questionnaire) (Spanish adaptation by Calvo, Caseras, Gutierrez y Torrubia, 2002) was used for diagnosing personality disorders. This instrument combines the speed and convenience of a self-administered questionnaire with the control of effects of mood state inherent to an interview. It is a solid diagnostic tool aligned with DSM-IV criteria when the clinical significance scale is administered.

Statistical analysis

The following descriptive parameters were calculated for all variables: mean and standard deviation for statistics adjusted to a normal distribution (Shapiro-Wilk test) and the median and interquartile range for statistics not adjusted to a normal distribution. Qualitative variables were expressed as relative frequencies in percentage. Both groups were compared using the chi-squared test (χ^2) or Fisher's exact test, as applicable, for categorical variables and using the Student's t-distribution or Mann-Whitney U for quantitative variables. The main variable is calculated at the 95% confidence interval level. Tests are considered significant if $p < 0.05$.

To evaluate factors that may influence predicting the presence of a bipolar disorder, a multivariate logistic regression model is used including all of those factors that may affect the dependent variable. Model selection criteria include parameters with $p < 0.1$ to enter and those with $p < 0.05$ to exit, although all confounding factors that modify their β or that of other parameters by over 20% are used. Furthermore, the corresponding interactions are tested, including only significant ones. When the presence of linearity or colinearity are detected, stratified data are displayed, adjusted for the main possible confounders. Statistical analysis is generated using SPSS v.17 software.

Results

Patients included totalled 837: 208 (24.9%) were from MHCs and 629 (75.1%) from DATCs. Of the 837 patients evaluated, 710 were diagnosed with some type of lifetime substance use disorder (SUD) (including alcohol, excluding tobacco). There were 127 participants (15.2%) without SUDs. Of the total sample, 174 patients were diagnosed a lifetime bipolar disorder (BD) (20.8% of the total sample), 83 were diagnosed a type I BD and 91 were diagnosed a type II BD.

Sociodemographic characteristics.

Table 1 displays the sociodemographic characteristics of bipolar patients. They were younger than the rest of the sample (36.4 years of age, SD = 9.2 compared with 38.9 years of age, SD = 10.4, $p = 0.004$) with a male majority, though this differed depending on whether they came from MHCs or DATCs.

Prevalence of both current and lifetime substance use disorders (SUDs) in the sample of bipolar patients (Table 2)

Given the majority of patients from DATCs, a high percentage of SUDs existed amongst bipolar patients. There were differences in the prevalence of abuse or dependence on alcohol, cocaine, cannabis and tobacco among bipolar and non-bipolar groups. There were no differences as to

Table 1. Characteristics of patients diagnosed with lifetime bipolar disorder ($n = 174$)

Age (years)	36.4 (SD = 9.2)
Male	126 (72.8%)
Unmarried	106 (61.6%)
Married	38 (22.1%)
Other	28 (16.3%)
Primary education	78 (45.6%)
Secondary education	69 (40.4%)
University degree	23 (13.5%)
Employed	80 (46.2%)
Unemployed	55 (31.8%)
Other	38 (21.0%)
Living with family of origin	85 (48.9%)
Living with own family	43 (24.7%)
Living alone	29 (16.7%)
Other	17 (9.8%)
Treatment centre:	
Mental Health ($n = 208$)	21 (10.1% of the total of MHCs)
Drug Addiction Treatment Centres ($n = 629$)	153 (24.3% of the total of DATCs)
Medical pathology	57 (32.9%)
Bipolar disorder subtypes:	
Type I	83 (47.7%)
Type II	91 (52.3%)

Note. SD = Standard Deviation

dependency on opioids. In addition, age at onset of alcohol use was lower in the group of bipolar patients than in non-bipolar addicts. Furthermore, there was a higher prevalence of a history of intravenous opioid use among these bipolar patients.

Personality Disorder (PD) diagnoses

There was a predominance of PD diagnoses among the bipolar disorder group compared with the non-bipolar disorder group ($n = 113$, 64.9% vs. $n = 301$, 45.4%, respectively, $p = 0.001$), with significant differences for all of the personality disorders evaluated. Likewise, when grouped by different clusters, there existed predominance of cluster A, B and C in the BD group.

Logistic regression model

A predictive logistic regression model was carried out for the presence of BD (Table 3). When adjusted for age, gender and other drugs, only addiction to cocaine as a risk factor (OR = 1.65, $p = 0.01$) and addiction to alcohol as a risk factor (OR = 2.2, $p = 0.001$) remained as predictive variables in the model. Given that this regression model showed problems of colinearity due to the relationship between the different addictions, a stratified analysis was performed to detect the presence or non-presence of addiction to alcohol and cocaine. The relationship between alcohol and BD remained statistically significant both in cocaine addiction as well as in non-addicts to cocaine. Similar results were ob-

Table 2. Substance use disorder and personality disorder in the sample of bipolar patients (n = 174)

Drug	Bipolar	Non-bipolar
Alcohol or SUD currently*	143 (82.2%)	438 (66.1%)
Lifetime*	165 (94.8%)	545 (82.2%)
Alcohol currently*	92 (52.9%)	255 (38.5%)
Lifetime*	134 (77.0%)	394 (59.4%)
SUD currently (w/out alcohol)*	121 (69.5%)	355 (53.5%)
Lifetime*	145 (83.3%)	470 (70.9%)
Cocaine currently*	94 (54.0%)	271 (40.9%)
Lifetime*	121 (69.5%)	367 (55.4%)
Opioids currently+	18 (10.3%)	82 (12.4%)
Lifetime+	45 (25.9%)	167 (25.2%)
Cannabis currently**	39 (22.4%)	94 (14.2%)
Lifetime**	90 (51.7%)	263 (39.7%)
Sedatives currently+	8 (4.6%)	29 (4.4%)
Lifetime****	32 (18.4%)	87 (13.1%)
Tobacco lifetime*	118 (67.8%)	372 (56.1%)
Single SUD diagnosis lifetime	34 (19.5%)	135 (20.4%)
Multiple SUD diagnosis	131 (75.3%)	410 (61.8%)
Intravenous opioid use (n = 44)**	35 (79.5%)	102 (60.4%)
Age at onset of use:		
Alcohol***	15.3 (SD = 4.2)	16.5 (SD = 6.1)
Cocaine+	20.3 (SD = 6.2)	21.2 (SD = 6.5)
Cannabis****	15.5 (SD = 3.5)	16.4 (SD = 4.5)
Opioids+	18.8 (SD = 6.1)	20.0 (SD = 5.6)
Personality disorders*	113 (64.9%)	301 (45.4%)

Note. SUD = Substance Use Disorder. SD = Standard Deviation.

+ = Not significant in comparison with the non-bipolar group. * = $p < 0.001$. ** = $p < 0.01$. *** = $p < 0.05$. **** = $p < 0.08$.

Table 3. Predictive logistic regression model for the presence of bipolar disorder

Variable	β coefficient	OR	P
Age	0.02	0.98	0.05
Gender (female)	0.56	1.74	0.01
Lifetime cocaine	0.50	1.65	0.01
Lifetime alcohol	0.78	2.2	0.0001

Note. Chi-squared of the model = 34.9, $df = 4$, $p = 0.001$.

tained as regards cocaine addiction when stratified for the presence of alcohol, though these differences were not statistically significant, but without differences between alcohol addicts and non-addicts to alcohol.

Comparison between bipolar disorders type I and type II

Objective differences between these groups were not found. The slightly higher percentage of addictions in the bipolar type I group was statistically no significant.

Characteristics of bipolar patients addicted to alcohol

Of the 174 bipolar patients, 92 were diagnosed a current alcohol use disorder and 134 a lifetime disorder. There was

a predomination of males (79.1%) in this subgroup compared with non-addicts to alcohol (65.9%, $p = 0.05$), a higher prevalence of cocaine dependency and a greater frequency of personality disorders in cluster A. There were only 20 patients with a lifetime dependency on alcohol without other concomitant SUDs, with a majority of females in this small group (11 females, 55% and 9 males, 45%). Meanwhile, there was a majority of males in the alcohol dependency group with other addictions (95 males, 84.1% and 18 females, 15.9%, $p = 0.02$ compared with bipolar patients not addicted to alcohol).

Characteristics of bipolar patients addicted to cocaine

There were 94 patients with a current dependency and 121 with a lifetime dependency on cocaine. There were predominantly more males compared with other bipolars ($p = 0.03$), lower education level ($p = 0.05$), higher unemployment rate ($p = 0.05$), greater use of opioids and sedatives and a higher prevalence of personality disorders in cluster B (53.2% vs. 37.5%, $p = 0.04$).

Bipolar patients in the mental health network

Of the 208 patients from the mental health network, 21 were diagnosed with BD. Of these, 13 (61.9%) were dual

Table 4. *Bipolar disorders (n = 21) in the mental health network (n = 208) and bipolar disorders (n = 153) in the drug addiction treatment network (n = 629)*

	Mental health network	Drug addiction treatment network
Age	42.7 years (SD = 13.3)+	35.6 years (SD = 8.2)**
Males (total of bipolars)	8 (38.1%)+	118 (77.6%)*
Females	13 (61.9%)	34 (22.4%)
Males (dually-diagnosed bipolars)	7 (53.8%)	
Females	6 (46.2%)	
Alcohol or SUD currently	8 (38.1%)+	
Lifetime	13 (61.9%)+	
Alcohol currently	5 (23.8%)+	87 (56.9%)**
Lifetime	10 (47.6%)*	124 (81.0%)**
SUD currently (w/out alcohol)+	5 (23.8%)+	116 (75.8%)+
Lifetime+	8 (38.1%)+	
Cocaine currently	4 (19.0%)*	90 (58.8%)+
Lifetime	4 (19.0%)+	117 (76.5%)+
Opioids currently	0	18 (11.8%)+
Lifetime	0	45 (29.4%)+
Cannabis currently	3 (14.3%)+	36 (23.5%)+
Lifetime	5 (23.8%)+	85 (55.6%)+
Sedatives currently	0	8 (5.2%)+
Lifetime	1 (4.8%)	31 (20.3%)+
Personality disorders*	16 (76.2%)*	97 (63.4%)**
Anxiety disorders		98 (64.1%)**
Bipolar disorder subtype		
Type I	9 (4.3% of Mental Health patients)	74 (11.8% of drug addiction treatment patients)
Type II	11 (5.3%)	80 (12.7%)
Age at onset of use:		
Alcohol	16.4 (SD = 3.2)+	15.2 (SD = 4.2)*
Cannabis		15.3 (SD = 3.3)****

Note. SUD = Substance Use Disorder. SD = Standard Deviation.

+ = Not significant in comparison with the non-bipolar group. * = $p < 0.05$. ** = $p < 0.01$. *** = $p < 0.001$. **** = $p < 0.07$.

lly-diagnosed (compared with 62, 33.2% in the non-bipolar patients, $p = 0.03$). There were predominantly more females in the bipolar subgroup but without differences in comparison with the remaining patients from the MHCs. However, there were slightly more males among dually-diagnosed patients (of the 13 dual diagnosis patients, 7 were male (53.8%) and 6 were female). As occurs in the general sample, the drugs most associated with this diagnosis were alcohol and cocaine, and there was a greater number of patients with PD (Table 4).

Bipolar patients in the drug addiction treatment network

Of the 629 subjects from the drug addiction treatment network, 153 were bipolar (24.3%). Although there were more males in this subgroup, the percentage of females was higher than in the rest of the sample from the drug addiction treatment centres. The presence of BD was associated with alcohol dependency and with a higher frequency of PD and diagnoses of anxiety disorders (Table 4).

When comparing bipolar patients from the drug addiction treatment and mental health networks, there were more males in the drug addiction treatment network ($p = 0.001$), with a worse employment status and higher unemployment rate ($p = 0.001$), more patients with a comorbid medical pathology ($p = 0.05$) and more diagnoses of disorders due to the use of alcohol, cocaine and cannabis. There were no differences as to prevalence of comorbid PD.

Bipolar disorder and risk of suicide

Patients with BD had a higher prevalence of risk of suicide as assessed by the MINI than the rest of the patients ($p = 0.001$) and the rest of the dually-diagnosed patients ($p = 0.006$). When stratified for the presence of lifetime disorders due to the use of alcohol, cocaine and cannabis, the prevalence of the risk of suicide was always higher in the group of bipolar patients compared with non-bipolar patients, but in the presence of any SUD the prevalence of risk of suicide was even higher. The risk of suicide in these bipolar patients was associated with the presence of a greater number of PDs

(2.9, SD = 2.8 vs. 1.9, SD = 2.7, $p = 0.01$), higher number of axis I diagnoses (3.6, SD = 1.9 vs. 2.4, SD = 1.5, $p = 0.001$), higher number of SUD diagnoses (2.9, SD = 1.6 vs. 2.4, SD = 1.4) and tending toward a younger age of onset of tobacco use (13.6 years of age, SD = 3.1 vs. 15.1, SD = 6.0, $p = 0.08$) than bipolar patients without risk of suicide.

Discussion

There exists an association between BD and SUDs, mainly an association with alcohol and cocaine, in the sample of patients in treatment. A high percentage of bipolar patients in treatment through the mental health network - up to 62% - were diagnosed with SUDs during their lifetime. Other clinical samples have yielded similar figures, such as a prevalence of SUDs of 54% (Yatham, Kauer-Sant'Anna, Bond, Lam & Torres, 2009), 59% in a sample of manic patients (Frank, Boland, Novick, Bizzarri & Rucci, 2007) or 72% of SUDs during one's lifetime in hospitalized bipolar patients (Bauer et al., 2005). On another hand, up to a quarter of addicts seeking treatment at drug treatment centres have a bipolar disorder. This is similar to other clinical samples (Nallet et al., 2013; Van Zaane, Van den Berg, Draisma, Nolen & Van den Brink, 2012).

Sociodemographic characteristics coincide with those of dually-diagnosed patients, with predominantly younger males (Tondo et al., 1999; Sonne & Brady, 1999). However, this male majority is less prominent in the mental health network and there is a significantly higher number of females in the drug addiction treatment network with this type of dual pathology than with the remaining diagnoses. Therefore, we may consider that the usual differences common to gender as regards dual pathology are mitigated in the case of dual bipolar patients (Frye et al., 2003).

The drugs most associated with bipolar disorder were dependence on alcohol, cocaine and cannabis, by order of magnitude of the difference compared with non-bipolar patients. These drugs are frequently described in relationship with BD (Cerullo & Strakowski, 2007; Merikangas et al., 2008; Salloum et al., 2005). In addition, as regards alcohol, the age at onset of alcohol use of patients with BD is younger, possibly suggesting a causal role for alcohol use. However, the transversal nature of this study does not allow for establishing other ethological relationships. Both alcohol and cocaine use have been considered substances that may induce pathological affective states, but these substances may also help short-term regulation of negative emotional states, though with a more prejudicial long-term impact. Likewise, the use of these substances increases during manic episodes due to the elation and disinhibition characteristic of these. Therefore, the combination of cocaine and alcohol appears to have a special link with bipolar disorder due to their specific effects on affective states (Pacini et al., 2010) and it has been suggested that they are associated with different

clinical symptoms (Mitchell, Brown & Rush, 2007). Other researchers suggest that a prolonged exposure to alcohol of some bipolar patients with mild disorders would result in more clinically relevant symptoms of the illness (Cerullo & Strakowski, 2007). Other authors observe relationships between the types of clinical symptoms of mania and the specific use of drugs such as alcohol or cannabis (Güclü, Şenormanci, Aydin, Erkiran & Köktürk, 2014) or a differential use of drugs such as cocaine, alcohol or cannabis depending on the type of bipolar disorder (mixed, hypomanic, mania or depression) (Maremmani et al., 2012). The strong association between bipolar disorder and alcohol dependence has also been related with the possible existence of genetic factors common to both (Carmiol et al., 2015).

In another study we carried out with the subgroup of psychotic patients, we found a relationship between psychosis and addiction to cannabis (Arias et al., 2013b). Together with the data from the current study, there appears to be a certain specificity between different substances and different diagnoses of mental disorders.

The high prevalence of PD diagnoses in these dually-diagnosed patients support other studies that highlight a high comorbidity in dually-diagnosed bipolar patients, but also raises the question as to whether there may be problems in the differential diagnosis between PD, the symptoms inherent to SUDs and BP, as pointed out by some authors (Levin & Hennessy, 2004; Stewart & El-Mallakh, 2007). It is possible that too many patients of this sample are diagnosed with a BD for having diagnosed as such those with changes in mood that are inherent to their SUDs or BD. Likewise, it is possible that too many patients of this sample are diagnosed with a PD due to the instrument used. In any case, the use of structured interviews may minimize this bias and, likewise, it has also been pointed out that, in recognition of the difficulty inherent to diagnosing these types of symptoms and the need for achieving a suitable diagnosis to differentiate affective and behavioural symptoms of BDs, PDs and SUDs, comorbidity between these symptoms is frequent with other PDs or axis I disorders, such as anxiety disorders (Bauer et al., 2005; Merikangas et al., 2007; Mantere et al., 2006; Merikangas et al., 2011; Mazza et al., 2009). Therefore, comorbidity of BD with PD, such as a borderline personality disorder, is associated with a greater risk of SUD (Hidalgo-Mazzei, Walsh, Rosenstein & Zimmerman, 2015).

Literature does not clarify which BD subtype is more related with SUDs. Some authors point out that patients with type I BD usually have more addictive behaviours (Merikangas et al., 2008) but other authors mention that addicted patients are more likely to have hypomanic or mixed symptoms (Do & Mezuk, 2013; Himmelhoch, Mulla, Neil, Detre & Kupfer, 1976; Keller et al., 1986; Mazza et al., 2009). Our study did not find differences in the prevalence of different SUDs, though the prevalence of SUD was slightly higher in type I BD. Given the small number of bipolar patients from

the mental health network, we cannot draw conclusions as to differences between bipolar disorder subtypes across both treatment networks.

Our data suggest that this subgroup of bipolar patients with addictions have a higher risk of suicide than other patients with mental disorders or addicts undergoing treatment, highlighting the greater clinical seriousness of this subgroup of dually-diagnosed patients. The increased risk of suicide amongst dually-diagnosed patients has already been researched (Carrà, Bartoli, Crocamo, Brady & Clerici, 2014; Comtois, Russo, Roy-Byrne & Ries, 2004; González-Pinto et al., 2006). Furthermore, the patient subgroup with risk of suicide is associated with higher comorbidity with axis I, with other SUDs and a higher number of concomitant PDs, wherefore they comprise a patient subgroup that requires special follow-up and proper management of all of these comorbidities.

Another relevant aspect of this study is the different profiles of the dually-diagnosed bipolar patients across the two public treatment networks. The drug addiction treatment network had more bipolar patients with a higher addictive comorbidity and other axis I disorders, though, surprisingly, not with axis II disorders, with a predominance of males, lower employment rates and poorer medical conditions. The data presented in this project can be extrapolated to the bipolar population of the drug addiction treatment centres, though a larger sample size would be required to extrapolate said data to the mental health network.

A limitation of the study is its transversal nature, which does not allow for inferring causal relationships. Most of the patients have polydrug use, wherefore solid conclusions cannot be drawn as to the effect of any particular drug. The sample is comprised of patients undergoing treatment, wherefore the data cannot be extrapolated to the general population, and the existence of comorbidity with other disorders may favour seeking treatment. The use of the MINI as the diagnostic interview might not be the most suitable for this population, given that it does not distinguish between induced main symptoms as other diagnostic interviews do and might fail to perform a suitable differential diagnosis; it was chosen for the simplicity of its administration, given the high number of researchers involved. The sample from the mental health network is quite small. Given that most patients with bipolar disorder seek treatment through the latter network, it is possible that the characteristics of our sample fail to represent bipolar patients in treatment, but rather of addicts in treatment with comorbidity with a bipolar disorder.

One of the strengths is the considerable sample size, especially as regards patients from the drug addiction treatment network, wherefore we consider it to represent addicts that seek treatment at drug treatment centres. In addition, the use of the structured interview increases diagnostic reliability.

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Conflict of interests

The authors declare the inexistence of conflicts of interest.

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