Mental disorder comorbidity in a public physical and mental health community-based care network specialized in alcohol and drugs

Comorbidade de transtorno mental em uma rede pública de atenção à saúde física e mental comunitária especializada em álcool e drogas

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ABSTRACT

Mental disorder comorbidity in substance use disorder patients is a common problem with health care implications. This study aimed to investigate mental disorder comorbidity in a physical and mental health community-based care network specialized in alcohol and drug dependence. This multicenter cross-sectional study included 103 substance use disorder patients from four Brazilian Referral Centers for Psycho-Social Care. Data were assessed by Mini International Neuropsychiatric Interview and Addiction Severity Index questionnaires. Unemployed single men between 30-59 years old characterized the sample and showed a significant correlation between alcohol, cocaine or *crack*, and cannabis dependence with some other serious mental disorders, but not among tobacco smokers. Mental disorder comorbidity is still common in some models of psychosocial care. It suggests that an unambiguous dual-diagnosis and a precise differentiation between primary mental disorders and substance use disorders must be a common clinical staff practice part of the routine in the different models of drug dependence care to obtain an effective mental health intervention for these individuals.

Keywords: substance-related disorders; mental disorders; comorbidity; primary health care.

RESUMO

A comorbidade de transtornos mentais em pacientes com transtornos por uso de substâncias é um problema comum com implicações para os cuidados de saúde. O objetivo deste estudo foi investigar a comorbidade de transtornos mentais em uma rede comunitária de atenção à saúde física e mental

especializada em alcoolismo e dependência química. Este estudo transversal multicêntrico incluiu 103 pacientes com transtornos por uso de substâncias de quatro centros brasileiros de referência para atenção psicossocial. Os dados foram avaliados por meio dos questionários Mini International Neuropsychiatric Interview e Addiction Severity Index. Homens solteiros desempregados, de 30 a 59 anos, caracterizaram a amostra e mostraram correlação significativa entre dependência de álcool, cocaína ou crack e cannabis com alguns outros transtornos mentais graves, mas não entre os fumantes de tabaco. A comorbidade de transtornos mentais ainda é comum em alguns modelos de atenção psicossocial. Sugere que um diagnóstico duplo inequívoco e uma diferenciação precisa entre transtornos mentais primários e transtornos por uso de substâncias deve ser uma prática comum do pessoal clínico como parte da rotina nos diferentes modelos de atenção à toxicodependência para obter uma intervenção na saúde dos indivíduos.

Palavras-chave: transtornos relacionados ao uso de substâncias; transtornos mentais; comorbidade; primeiros socorros.

INTRODUCTION

The increasing persistent, sporadic excessive psychoactive substances (or drugs) misuse, inconsistent with or unrelated to licit or acceptable medical practice, acting on the Central Nervous System (CNS) is considered in current society a serious public health concern. Around 275 million global population (aged 15-64 years old) have used illicit drugs in 2021. Among drug users, more than 36 million people developed substance use disorder (SUD) or dependence syndrome (also known as DSM-IV-TR substance dependence) (1).

In 2017, the III Brazilian National Alcohol and Drugs Survey (III BNADS) (2) reported that alcohol was the most used psychoactive substance in the country, with more than half of respondents (aged 12 years and older) reporting having consumed alcohol at some point in life. Moreover, approximately 2.3 million people met the criteria for alcohol dependence in the 12 months before the survey.

Although the prevalence of current tobacco use has dropped substantially in the population in recent years, the use of nicotine (the main psychoactive substance in tobacco smoke) remains in second place among ps. It is estimated that about 26.4 million Brazilians between 12 and 65 have consumed some tobacco product, corresponding to 17.3% of this population

group. Among individuals who consume cigarettes, it was estimated that about 23.5% of them had a high or very high degree of dependence, corresponding to about 4.9 million Brazilians (or 3.2% of the general population aged 12 to 65 years). Brazil, like other countries, also has high consumption and greater accessibility to cannabis (1; 2).

The III BNADS (2) reported that the most commonly used illicit substance in Brazil is marijuana: 7.7% of Brazilians aged between 12 and 65 have used it at least once. In second place is powder cocaine: 3.1% have already consumed the substance. And when observing a specific cut of recent time (referring to the 30 days prior to the interview), the highest prevalence was observed concerning the consumption of marijuana, used by approximately 2.2 million individuals.

Also, approximately 1.4 million people between 12 and 65 years old reported having used crack and similar drugs at some point in their lives, corresponding to 0.9% of the population studied. Brazil is the second largest consumer of cocaine hydrochloride (also known as cocaine) and the first of crack (a type of free-base smoking cocaine, also known as crack) worldwide. Brazil accounts for 20% of the world market for cocaine and its derivatives (1).

Several studies pointed beyond biological issues to other factors that contribute to drug use and diagnosis of mental disorders, inclu-

ding socioeconomic issues such as poverty, gender discrimination, racism, family violence, and marginalization (3). Dalpiaz (2014), in his study, demonstrates that bullying and cyberbullying can also significantly influence alcohol abuse by adolescents. Through testimonies of users of a CAPS AD (5), it showed that among the factors associated with the use of alcohol and other drugs, the social bond such as friends and companions is a risk factor that contributes to the use of these substances. In addition, the family's feelings of sadness, depression, parties, and substance use were also identified as risk factors.

SUD is a cluster of physiological, behavioral, and cognitive phenomena in which the use of a substance or a class of substances takes on a higher priority for a given individual than other behaviors that once had greater value (6). It has been associated with severe neuropsychiatric disturbances following long-term drug misuse that may lead to developing other mental disorders (such as mood and anxiety disorders or particular low-prevalence mental illnesses such as schizophrenia) (7). Furthermore, disentangling the symptoms of preexisting mental disorders and those overlapping of dependence may be difficult in treating patients with the diagnosis of SUDs.

On this basis, clinical staff worldwide consider the co-occurrence of dual mental disorders (also known as mental disorder comorbidity, MDC), simultaneously or sequentially, of SUD and other mental disorders as part of a complex set of closely related phenomena that can negatively influence the course and prognosis of both mental disorders (8). However, it is accepted that the diagnosis of comorbidity does not imply a cause-effect relationship between mental disorders but (for certain of these disorders) establishes major risk factors between each other and shows flexibility to cover associations between several mental disorders diagnoses from different etiologies, and with different clinical courses (9).

Therefore, a thorough identification of SUD and other mental disorders is very important to ensure a suitable treatment setting, accurate

prognosis, and increased chance of recovery for these MDC patients.

According to the current Brazilian public network of mental health care, treatment of patients with severe mental disorders occurs mainly in the primary healthcare services or the unified national health system, through the referral centers for psychosocial care (Portuguese acronym, CAPS). They are physical and mental health community-based care services, similarly to psychiatric care models practiced in other countries (10; 11), adopted by the Brazilian public mental health care plan to overcome the old hospital-centric model. In this current Brazilian mental health care model, there is a specialized service in CAPS for drug and alcohol dependence (CAPS AD) (12).

To the best of our knowledge, few researchers are addressing the MDC in the current Brazilian national policy on mental health. Our study investigates the prevalence and correlation of major risk factors associated with the co-occurrence of mental disorders in Brazilian CAPS AD.

METHOD

Study design and setting. This is an analytical cross-sectional study conducted from January 2013 to October 2013. The subjects were selected from the patients treated in four different CAPS AD (Ana Pitta, João Rosendo dos Santos, Santo Onofre, and Primavera) from the metropolitan area of Aracaju - a Northeast Brazilian city localized in the Brazilian state of Sergipe [10º 54' 40" S; 37º 04' 18" W]. In order to pre-testing the research instrument and questionnaire or interview schedule, a preliminary analysis of a small-scale version of the full-scale study was carried out considering the proportional allocation of each CAPS AD per population.

Subjects. A representative sample was stratified in the selected CAPS AD according to the number of patients allocated in each health unit. It included 103 randomly selected patients aged 18 years or more with a diagnosis of F19.2 according to the International Classification of Diseases and Related Health Problems 10th

Revision (ICD-10). F19.2 or dependence syndrome is a mental and behavioral disorder due to multiple drug use and other psychoactive substances (4).

In our study, we included patients dependent on some of the most used drugs in the world, i.e., alcohol, tobacco, cannabis, cocaine, and *crack*. Patients showing apparent symptoms of drug poisoning and/or disabilities to answer the questionnaire and/or who were transferred to another health unit during the treatment and/or in treatment for SUD for less than a month were excluded.

Measurements and outcome evaluation. The psychiatric structured diagnostic interview instruments employed in our study were the Brazilian versions of Mini International Neuropsychiatric Interview (M.I.N.I. Plus 5.0.0) and Addiction Severity Index (ASI-6) (11) applied to patients under the supervision of the psychiatric staff of each CAPS. Complementary data were collected from the medical records of patients.

Statistical analysis. Statistical analyses were conducted using the Statistical Package for Social Software Sciences (SPSS version 20.0, IBM Inc., Chicago, USA, 2008). Data were analyzed using the chi-square test (x^2) **to measure** the absolute frequency (n) and relative frequency (%), and Spearman´s rho correlation coefficient test (r_s), with a significance level of 0.05. Prevalence and comorbidities rates were calculated as percentage values, with 5% margin of error and 95% confidence intervals (CI).

The Ethics Committee of Federal University of Sergipe approved this study (CAAE 06771613.7.0000.5546). All patients signed a consent form after being informed about the stages of the study, benefits, and risks involved in the research.

RESULTS AND DISCUSSION

SUD is a complex and multifactorial mental disorder. Krueger et al. (2002) correlated personality and psychopathology conditions, typical in late adolescence and adulthood, with specific factors of each drug user to explain the etiology of SUD (12). According to these authors, differences in the externalization of these variables were mostly genetic, but genetic and environmental factors accounted for distinctions among phenotypes of personality and psychopathology linked to drug use and SUD development (12).

In this context, age at onset of drug use, primary mental disorder, previous drug experiences, drug effect expectancies, and some social-demographic conditions (e.g., gender, age, educational level, ethnicity, and occupational status) as important variables in the development of SUD (13, 14).

In our study, the social-demographic profile of the patients agreed with reports from other Brazilian mental healthcare services (15) and councils on alcohol & drugs in other countries (16). As shown in Table 1, the age group ranged from 18 to 66 years old for all our study patients, with mean age and median of 37.9 ± 9.1 and 44 years old, respectively. Single males, between 50 to 59 years old, that studied until 5th to 8th grade, were unemployed and actively looking for work or reported a lack of a formal labor relationship predominantly characterized our sample.

Men showed higher rates of drug use and SUD than females for all age groups assessed in our study. It probably was because females are less likely to seek treatment for SUD for multiple reasons, such as social stigma and drug use patterns. They prefer to seek treatment for SUD in mental health or primary care settings rather than in specialized treatment programs (17), which may have contributed to the lower prevalence of females observed in our study. However, despite our sample's low prevalence, some researchers suggest that females may be more susceptible to craving and relapse (18), which are key phases of the addiction cycle.

Although not shown in **Table 1**, no-white ethnicity (80.58%) was more prevalent in our sample independently of gender and age. It agrees with the Brazilian population's census data, in which no-white ethnicity [or race] showed the highest correlation with the no-excellence health system, educational program, and informal employment status (19).

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Table 1. Distribution of individuals (n=103) regarding the social-demographic profile, CAPS AD, January to October 2013.

Gender	f*
Male	94 (91.27)
Female	09 (08.73)
Age group, y	
19 and younger	02 (01.94)
20 ─┤ 29	12 (11.65)
30 ─┤ 39	23 (22.33)
40 ─┤ 49	29 (28.16)
50 ─┤ 59	31 (30.10)
60 ─┤ 69	06 (05.83)
Schooling	
Illiterate	17 (16.50)
1st to 4th grade	33 (32.04)
5th to 8th grade	45 (43.69)
1st and/or 2nd year of high school.	05 (04.85)
≥ 3rd year high school	03 (02.91)
Marital Status	
Married	24 (23.30)
Single	63 (61.17)
Divorced	10 (09.71)
Widowed	06 (05.83)
Employment Status	
Full-time or Part-time	18 (17.48)
Unemployed and actively looking for work	31 (30.10)
Outside the labor market	20 (19.42)
Informal Work (irregular and no fixed schedule)	34 (33.01)

*f, absolute and relative frequency (%); CAPS AD: Psychosocial Care Center Alcohol and Drugs

Another independent variable evaluated was the percentage of illiterate patients and the high level of school dropout before high school (75.73%). The influence of the level of education on the development of SUD is controversial among researchers. Some evidence suggests that poor education is a risk factor for multiple drug use and SUD development in childhood and adolescence, leading to anti-conventional behavior such as early school leaving and removal from the labor market. Other researchers suggest that early drug use causes school dropout and low educational attainment (20). Regardless of the direction, or bi-direction, of these relationships, our study was in accordance with these theoretical paradigms.

According to Lander et al. (2013), drug use and SUD also increase the likelihood of

unemployment and decreases the chance of finding and holding down a job (21). On the contrary, unemployment is a significant risk factor for drug use and SUD development. In our study, the patients predominantly showed irregular income sources (82.52%). Between those unemployed and outside the labor market, 49.51% of patients were financially supported by friends and/or family (26.21%) and by the Public Social Security Program (23.30%) such as the unemployment insurance (16.51%) and the retirement or disability benefits (6.79%) (data not shown).

Furthermore, a small sample percentage was married at the time of our study or had been married before data collection, but most of our sample was single. Serious and devastating problems in a spousal relationship arise when drug use and SUD are involved. Some of them are feelings of abandonment, anger, violence, lack of intimacy, money problems, co-dependence and sexual issues. Drug misuse can also affect children and other family members, which can have a long-lasting impact on future relationships and personal development. No married/cohabiting status has been considered an important potential risk factor for drug use recidivism and SUD treatment completion failure (22,23).

The early-onset drug misuse and the type of related psychoactive substances are two other important potential risk factors for SUD development (24). The onset of drug use was mainly observed in adolescence's early and late stages (Table 2). Alcohol and tobacco were more frequently reported as the first drug used in all age groups.

Table 2. Distribution of individuals* (n = 103) regarding onset age and first drug used, CAPS AD, January to October 2013

Age group	Alcohol	Tobacco	Cocaine/*crack*	Cannabis	Total
05 ⊣ 09	10 (09.71)	06 (05.83)	-	-	16 (15.53)
10 ⊣ 14	28 (27.18)	06 (05.83)	01 (00.97)	07 (06.80)	42 (40.78)
15 ⊣ 19	26 (25.24)	07 (06.80)	-	03 (02.91)	36 (34.95)
20 ⊣ 29	09 (08.74)	-	-	-	09 (08.74)
Total	73 (70.87)	19 (18.45)	01 (00.97)	10 (09.70)	103 (100.00)

*absolute and relative frequency (%). CAPS AD: Psychosocial Care Center Alcohol and Drugs

About the age at onset of drug use, alcohol was used earlier than tobacco, often in age groups of 10⊣ 14 and 15⊣ 19 years old, respectively. Although less often, 15.53% of patients reported having used alcohol and tobacco in childhood (in age 5⊣ 9 years old) (Tables 2 and 3). Even though children and adolescents are considered a vulnerable group for SUD development, alcohol and tobacco are often licit drugs with dependence-producing properties indiscriminately consumed worldwide as part of family customs and social youth development.

On the contrary, cannabis and cocaine or *crack* evaluated in this study showed a similar age at onset use (often in the age group of 10⊣ 14 years old); but less often related to the first drug used (only in 10.67% of cases).

Table 3. Distribution of individuals* (n = 103) regarding the different drug use patterns, CAPS AD, January to October 2013.

Drugs	First use	Lifetime use	Dependence	Usage under treatment
Alcohol	73 (70.87)	103 (100.00)	83 (80.58)	51 (61.45)
Tobacco	19 (18.46)	69 (66.99)	45 (65.22)	41 (91.11)
Cocaine/*crack*	01 (00.97)	52 (50.49)	45 (86.54)	36 (80.00)
Cannabis	10 (09.70)	42 (40.78)	08 (19.05)	07 (87.50)

*absolute and relative frequency (%). CAPS AD: Psychosocial Care Center Alcohol and Drugs

Alcohol and tobacco are the drugs most consumed worldwide (1). As shown in Table 3, everyone in the sample used alcohol at least once in his or her lifetime, and more than two-thirds of patients were tobacco smoking. Furthermore, a high prevalence of SUD was observed among alcohol and tobacco users. On the other hand, half of the patients used cocaine or *crack* at least once in their lifetime, and 86.54% were diagnosed with SUD. Based upon the US National Surveys on Drug Use and Health (NSDUH) (2000-2002) (25), the risk of developing SUD was higher for adolescent recent-onset users of the different types of cocaine administered by different routes (oral ingestion, intravenous injection, nasal inhalation [snorting], or smoking). Similar findings were observed in other Brazilian surveys that reported cocaine or *crack* dependence in more than 70% of psychiatric patients (26). Since the 90s, the Brazilian population has observed a gradual and heavy increase in crack use. It is estimated that millions of Brazilians have been suffering from cocaine and *crack* dependence (27). Dependence on alcohol, tobacco and cocaine or *crack* could also be associated to their positive reinforcing potential to induce repeated self-administration without the need of external factors or apparent cause, involving feelings of pleasure and happiness, as well as intensity and length of drug withdrawal symptoms and their tolerance effects.

On the other hand, although 40.78% of patients reported having used cannabis at least once, in their lifetime, less than 20% of cannabis users were seeking treatment for SUD. This is in disagreement with the increasing number of individuals requiring treatment for cannabis dependence in Europe, North America, Africa, and Oceania (1). However, current information on treatment admission for cannabis dependence in South America is scarce. Cannabis is one of the most used recreational drugs worldwide, but only long-term and heavy cannabis users usually seek SUD treatment (1). In the Brazilian population, the age at onset of cannabis use is similar to the United States, but SUD starts later, probably because the negative effects of cannabis only become perceived after long--term and heavy use (28).

Furthermore, individuals diagnosed with cannabis dependence, especially adolescents, often suffer from MDC (29). In this study, cannabis was never used alone but always concomitantly with other drugs (Table 1). These findings suggest that cannabis users and those diagnosed with cannabis dependence are more likely to seek treatment primarily for cocaine or *crack*, tobacco, and alcohol dependence than for the negative effect of cannabis misuse.

Despite the likely correlation between early age at onset of drug use and SUD development observed in our study, the mean age at onset of seeking treatment for SUD in our sample was 37.9 ± 9.1 according to the age range of approximately 30 years and older, usually observed in the different studies on SUD treatment worldwide (15,29)

The use of multiple drugs is a common practice among drug users, usually related to reducing craving and/or withdrawal syndrome induced by others (30). In this study, the use

of more than one drug (Table 1) was observed in 61.17% of individuals, concomitantly or interchangeably. In these cases, alcohol was the most used psychoactive substance associated with other recreational drugs (53.40%). Alcohol was mainly used along with tobacco and cocaine or *crack*, likely due to the increase in the pharmacokinetic disposition of cocaine or *crack* in the presence of ethanol. It was also used with cannabis, tobacco/cocaine or *crack*, tobacco/cannabis/cocaine or *crack*. Another important pattern of multiple drug use was observed in 32.04% of cocaine or *crack* users. In these cases, cocaine or *crack* users also used tobacco or cannabis, likely to decrease the typical dysphoric or "bad" effects of the cocaine or *crack* and increase (or prolong) its positive or "good" effects (30). We observed that 43.69% of tobacco users and 7.77% of cannabis users were associated with multiple drug use.

Regarding the treatment completion, more than 60% of alcohol dependents and at least 80% of other patients treated for SUD kept using drugs. Furthermore, most individuals (85.44%) (data not shown) had already been treated for SUD at least once in their lifetime. Similar to our findings, some researchers have suggested that poor engagement and/or non-adherence to medical care could be related to the co-occurrence of mental disorders in patients treated for SUD (31,15).

The coexistence of two (or more) mental disorders, independently of one another, in patients with the diagnosis of SUD and the negative effect of dual-diagnosis on clinical management of these patients has been reported for many years and is still a significant concern in medical care. The prevalence of MDC has been high in the general population and higher among individuals seeking treatment for SUDs worldwide (32). National surveys based on the general population of different countries found at least two mental disorders in 35.3% to 45.0% of individuals over 12 months. In these cases, the number of individuals seeking treatment in the different settings of the health care system increased according to the number of mental disorders coexisting, ranging from 30.6% with

only one mental disorder to 76.1% with more than three mental disorders (33).

The diagnosis of SUD and at least one other mental disorder simultaneously or sequentially was observed in 94.17% of individuals. As shown in Table 4, moderate to a high incidence of one (or more) mental disorders were reported in these stratified sampling.

Regarding the mental disorder type most frequently observed among patients, mood disorders such as major depressive disorder, generalized anxiety disorder, and bipolar affective disorder showed the highest prevalence, like the findings of national epidemiological surveys of other countries (4,34).

Table 4. Distribution of individuals (n = 103) regarding mental disorder diagnosis, CAPS AD, January to October 2013

Mental disorder diagnosis	f*
Major depressive	72 (69.90)
Generalized anxiety	65 (63.11)
Bipolar affective	49 (47.57)
Psychotic Syndrome	45 (43.69)
Borderline Personality	45 (43.69)
Post-traumatic stress	38 (36.89)
Agoraphobia	35 (33.98)
Panic	32 (31.07)
Obsessive compulsive	23 (22.33)
Social Phobia	20 (19.42)
Only SUD	06 (05.83)

*f, absolute and relative frequency (%). CAPS AD: Psychosocial Care Center Alcohol and Drugs

Furthermore, we found statistically significant correlations between different mental disorders and some of the main Brazilian drugs misused (Table 5), consistent with the findings of these epidemiological surveys.

Our findings showed weak to moderate incidence and significant correlations between alcohol dependence and borderline personality disorder and between alcohol dependence and some major mood disorders, such as major de-

pressive disorder and bipolar affective disorder - one of the mental disorders most associated with SUD worldwide. On the other hand, although our study reported a moderate incidence of generalized anxiety and other major anxiety disorders, such as obsessive-compulsive disorder, panic disorder, and psychotic syndrome, no significant statistical association (p>0.05) with alcohol dependence was observed. It agrees with other Brazilian studies (35,36) but disagrees with other surveys around the world (37). According to Gómez-Coronado et al. (2018), differences in the prevalence of MDC between different studies could be attributed to (i) problems in distinguishing drug-induced and independent mental disorders, (ii) problems in separating mental disorders from the symptoms of intoxication or withdrawal, (iii) the choice of diagnostic instruments, (iv) the skills of the interviewers, and (v) differences in the study samples (36).

The neurobiological mechanisms of comorbidity between SUD and other mental disorders have often been correlated with disrupting drug effects in the multiple neurotransmitter systems. In this context, some studies suggest that heavy alcohol use decreases brain monoamine neurotransmitter levels and may be a risk factor for serious mental disorders, including alcohol dependence, anxiety disorder, major depressive disorder, and impulse control disorder. Other researchers observed a reciprocal cause-effect relationship between alcohol dependence and other serious mental disorders (37).

Positive correlations ($rs \geq 0.290$) were also observed between cocaine or *crack* dependence and almost all of the mental disorders most frequently observed in this study (Table 5), showing no significant statistical association only with panic disorder. Cocaine or *crack* dependence usually coexists with severe mood and anxiety disorders.

Table 5. Distribution of individuals (n = 103) and comorbidity correlationb between psychoactive substance and major mental disorders, CAPS AD, January to October 2013

Mental disorder	Alcohol		Tobacco		Cocaine/*crack*		Cannabis	
Major depressive	65 (63.11)a	0.374b+ p=0.000c	33 (32.04)	0.066 p=0.509	26 (25.24)	-0.233+ p=0.018	06 (05.82)	0.032 p=0.746
Generalized anxiety	55 (53.40)	0.133 p=0.179	28 (27.18)	-0.016 p=0.871	23 (22.33)	-0.219+ p=0.026	05 (04.85)	-0.004 p=0.971
Bipolar affective	35 (33.98)	-0.220+ p=0.025	18 (17.48)	-0.134 p=0.179	31 (30.10)	0.376+ p=0.000	05 (04.85)	0.087 p=0.384
Psychotic Syndrome	34 (33.01)	-0.112 p=0.260	18 (17.48)	-0.066 p=0.511	27 (26.21)	0.290+ p=0.003	07 (06.80)	0.256+ p=0.009
Borderline Personality	32 (31.07)	-0.211+ p=0.032	19 (18.45)	-0.026 p=0.794	34 (33.01)	0.566+ p=0.000	05 (04.85)	0.110 p=0.268
Panic	27 (26.21)	0.064 p=0.518	11 (10.68)	-0.126 p=0.204	13 (12.62)	-0.041 p=0.677	08 (07.77)	0.432+ p=0.000
Obsessive compulsive	19 (18.45)	0.027 p=0.783	07 (06.80)	-0.143 p=0.149	17 (16.50)	0.327+ p=0.001	06 (05.82)	0.367+ p=0.000

aabsolute and relative frequency (%); br$_s$; cp values ≤0.05, statistically significant. CAPS AD: Psychosocial Care Center Alcohol and Drugs

+Strongest correlations by Spearman´s rho coefficient for two discrete variables.

Kalivas (2004) correlated the primary effect of different types of cocaine in the brain dopaminergic pathway with a moderate incidence of MDC among its users. Blocking presynaptic dopamine transporter, the different types of cocaine increase monoamine levels in the synaptic cleft and continuously activate postsynaptic dopamine receptors. In the long-term, these compounds alter receptors' expression resulting in serious mental disorders, including major depressive disorder, suicide ideation, anxiety disorder, aggression, and schizophrenia. Some researchers suggested that this neuronal regulation could also be associated with developing serious mental disorders, including cocaine or *crack* dependence (38).

In our study, generalized anxiety episodes and psychotic disorder were observed in approximately 20% of interviewees diagnosed with cocaine or *crack* dependence. Long-term cocaine or *crack* use may lead to transient psychotic symptoms, such as paranoia or hallucinations. Mancebo et al. (2009) observed that regular cocaine or *crack* users even experimenting with primary paranoia episodes have an increased risk of other psychosis disorders or psychotic syndrome (39).

Significant correlations were also observed between regular cocaine or *crack* misuse and obsessive-compulsive disorder. Bardeen et al. (2014) observed that symptoms of obsessive-compulsive disorder are developed, maintained, or exacerbated after intaking certain stimulant drugs (e.g. cocaine or methamphetamine) (40). Furthermore, the strongest correlation between mental disorders and drug misuse was observed between cocaine or *crack* dependence and borderline personality disorder. According to Spradlin et al. (2014), a borderline personality disorder is particularly common among cocaine-dependent patients, although it is an additional risk factor for negative clinical outcomes. The mechanisms underlying this risk with the drug dependence frequently observed remain unclear (41).

Among cannabis dependents, we observed the lowest incidence of the mental disorder compared with other drugs, showing significant correlation (p≤0.01) with obsessive-compulsive disorder, psychotic syndrome, and panic disorder. Individuals with severe obsessive-compulsive disorder symptoms are more likely to cannabis misuse, but there is not a positive correlation between frequency and quantity of cannabis use. Furthermore, this association was independent of the coexistence of other mental disorders such as anxiety, depression, and stress (42). According to Aubina et al. (2013) and our findings, this SUD has been related to higher obsessive-compulsive disorder severity and treatment non-compliance in patients with preexisting schizophrenia or other psychotic syndrome diagnoses (43).

Heavy and long-term cannabis use has often been correlated with increased odds of panic episodes. In this case, panic episodes may have been induced by cannabis use or maybe a withdrawal symptom of cannabis dependence.

Due to complex psychopathological mechanisms, tobacco smoking among patients with mental disorders is well established and more frequent than in the general population. Tobacco dependence and other mental disorders coexistence increase the risk of smoking-related morbidity and mortality. Furthermore, the neurobiological and psychosocial factors linked to smoking are strongly related to other mental disorders, notably depression and schizophrenia (44). However, no statistically significant correlation was observed with any of the assessed mental disorders.

The main limitations of our study were its epidemiological design and sample size. In order to explain patterns of mental comorbidity occurrence and etiology, we employed a cross-sectional observational study. However, cross-section design captures information based on data gathered at one specific point in time, and then the causal effect between measurements and outcome cannot be described (i.e. whether the outcome followed exposure in time or exposure resulted from the outcome) with minimum distortion or er-

ror. Furthermore, data gathered represent the patients treated in Brazilian public physical and mental health community-based care services, specializing in alcohol and drugs, from Sergipe, and generalization or application to the greater population should be done with caution.

Contrastingly, data were collected from multiple outcomes and exposures assessment, containing complete psychiatric diagnostic assessment, clinical representative sample, and MDC measurement among patients with a diagnosis of SUD from mental health community-based primary care services.

CONCLUSION

The co-occurrence of SUD and other mental disorders is still common in the current Brazilian physical and mental health community-based care model, compromising the diagnosis, treatment, and prognosis of mental health in psychiatric patients. It suggests that an unambiguous dual-diagnosis and a precise differentiation between primary mental disorders and SUDs must be a common clinical staff practice part of the routine in the different models of drug dependence care to obtain an effective mental health intervention for these individuals.

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