



## ORIGINAL ARTICLE

## Factors Associated with Crack Cocaine and Alcohol Addicts: A Community-based Drug Treatment Service ('CAPS-AD') Case Study

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### KEYWORDS

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**ABSTRACT:** Drug addiction is a serious public health problem, related to several psychiatric and psychosocial problems. Drug users are generally inserted in a context of great social vulnerability, often associated with violence, poverty, and family conflicts. The effects on the cognitive sphere of drug user patients undergoing treatment at the Center for Psychosocial Care - Alcohol and Drugs (CAPS-AD), Rio de Janeiro, Brazil, with a diagnosis of crack dependence (CUD group - Drug Use Disorder) were evaluated. Cocaine and/or alcohol (AUD group - Alcohol Use Disorder), according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). This is a quantitative, exploratory, and descriptive research based on (sociodemographic research) and structured questionnaires (Frontal Assessment Battery, Mini-Mental State Examination, Obsessive-Compulsive Drinking Scale, Cocaine Obsessive-Compulsive Scale, Hamilton Depression Rating, Hamilton Anxiety Rating Scale). The results obtained after the application and interpretation of the questionnaires point to cognitive deterioration in drug users. At the same time, alcohol and drug users showed the worst results in the domains of attention/calculation, evocation memory and temporal/spatial orientation. The results obtained in the research showed that the users of alcohol and drugs participating in the research presented a worse result in the fields of attention/calculation, evocation memory and time/spatial orientation. This fact corroborates the hypothesis that the chronic use of alcohol and crack cocaine affects more directly prefrontal and temporal brain regions and the forebrain, areas responsible for abstract thoughts and planning, associations of thoughts and memories, attention, verbal fluency, memory visual, verbal memory, learning ability and executive functions.

### INTRODUCTION

Brazil has been undergoing profound transformations in the field of mental health since the late 1970s [1]. The hegemonic hospital-centric model was replaced by another model specialized in territorial services open to the community, such as Psychosocial Care Centers (CAPS) and Therapeutic Communities supported by outpatient clinics, which is a common form of long-term

residential treatment for substance use disorders, Community Centers, hospitalizations that still exist in psychiatric hospitals and those that occur in general hospitals, in addition to bodies that support the Family Health Strategy and other forms of health care [2]. This process, combined with the construction of expanded theoretical frameworks on the relationship between

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health and mental illness and practices of social inclusion of mental patients, more than producing changes in care, has been transforming the paradigm of mental health in Brazil. We call this process the Brazilian Psychiatric Reform [3].

The Brazilian Psychiatric Reform is a historical process resulting from the struggle of workers and users of mental health services. In 2001, Law 10,216 was enacted, which redirected the care model and provided for the rights of users of mental health services. Among other things, the law guarantees that social inclusion is one of the most important purposes of processing [4]. From there, a new national mental health policy begins, after numerous successful experiences in municipalities throughout Brazil. As a result, CAPS proliferated across the country, accompanied by the progressive reduction of beds in psychiatric hospitals [5].

In Brazil, the National Policy on Drugs established a new approach based on reducing vulnerability and risk factors and strengthening protection through therapeutic practices and strategies for social inclusion harm reduction and intersectoral partnerships [6]. Therefore, investments in this area were necessary to search for effective actions that consolidate the model of psychosocial care [7]. Thus, within the scope of the Unified Health System (SUS), the treatment of people with problems arising from the use or abuse of alcohol and other drugs is based on the Psychosocial Care Center for Alcohol and Other Drugs (CAPS-AD), whose principle is prevention and health promotion, interdisciplinarity, social reintegration, action in the community and replacement of former asylums [8]. They also include therapeutic and preventive activities, through individual assistance (drugs, psychotherapy, and guidance), group assistance (psychotherapy, operative group, social support activity), therapeutic workshops, home visits, assistance to families and community activities [9].

Regarding drugs, these can be defined as substances not produced by the organism that have the property of acting in the brain, modifying mental functions, such as judgment, mood, perception, and behavior in general [10, 11]. It should be noted that one of the aspects that should be highlighted is that the continuous use of any psychoactive substance produces brain diseases due to its

voluntary initial use. The consequence is that, from the moment that the person develops a dependence, the use becomes compulsive, destroying many of the best qualities of the individual, which can contribute to the destabilization of him with his family and with society [12].

The lack of public policies and effective treatments for crack addiction [13] encourages crack users to seek the combination of crack and other psychotropic drugs, in order to modulate the intensity or duration of the effects of this drug, either by reducing adverse consequences or intensifying and prolonging favorable effects [14-16].

Compared to the general population, drug addicts have greater difficulty performing tasks that use executive functions and planning, as well as activities that require impulse control or concept formation [17]. Compared to the general population, drug addicts have greater difficulty in performing tasks that use executive functions and planning, as well as activities that require impulse control or concept formation. This can be explained by the various neuropsychological damages that the acute or chronic use of psychotropic substances causes, such as bradypsychism; difficulty in processing information; damage to constructive praxis and visuospatial perception; the decrease in the ability to plan and organize tasks, to the detriment of abstraction; delay in learning and performance of executive functions; the loss of operational and episodic memory and finally the slowdown of reaction time [18]. Patients who have already had some of these damages caused by illicit drugs have reported, in research, that they feel a lack of motivation to change their lifestyle habits. This fact can be corroborated by changes in the abilities to plan and organize tasks, resulting in difficulty in making assertive decisions about maintaining their treatment, affecting their adherence and effectiveness [19].

Based on this context, research on human cognition becomes fundamental for understanding the cognitive and emotional effects of psychoactive substances. Chronic alcohol use is often associated with damage in the motor and cognitive areas, as well as, it has been shown that this use causes changes in the performance of certain brain functions. The main area of cognition that needs a more standardized and comprehensive assessment in these long-time alcoholic patients is

memory, which consists of the meaning that each organism registers facing exposure to actions or involvements [20].

Thus, it is a prominent fact that individuals who present for treatment due to alcohol and/or drug addiction present mild to severe deficits in abstract reasoning, executive functions, visuospatial skills, new learning, and memory [21]. Rigoni et al. [20] show that the chronic use of alcohol and/or drugs can cause a series of damages in neurocognitive functions, which may be correlated with learning problems, abstraction, problem-solving, visuospatial analysis and synthesis, psychomotor speed, speed of information processing and cognitive efficiency.

The analysis of this research consists of evaluating the possible effects on the cognitive sphere of patients using narcotics undergoing treatment at CAPS-AD in the city of Rio de Janeiro, using as a parameter/instrument the application of questionnaires that assess the cognitive quality of individuals undergoing clinical care.

## MATERIALS AND METHODS

This is a descriptive, cross-sectional study with a quantitative approach, where individuals were analyzed at the same historical moment, as well as the factor and effect of exposure, identifying the existence of associations between exposure and disease [22].

The target audience were alcohol and drug users treated at CAPS-AD, located in the city of Rio de Janeiro. The composition of the number of patients' participation was done on a consolidated basis of all those who met the criteria for inclusion in CAPSad III care that make up the entire care network (CAPSad III Antônio Carlos Mussum/UAA Cacildis; CAPSad III Miriam Makeba; CAPSad III Paulo Portela; and CAPSad III Raul Seixas). The type of sampling used was non-probabilistic and convenience. The sample was calculated using Excel software, with a confidence interval of 95%, error of 5% and expected prevalence of occurrence of the phenomenon of 50% and 50% of non-occurrence. This resulted in a sample of 112 patients who agreed to participate in the study, by signing the Informed Consent Form. There is also inference, which is the set of techniques, based on probability theory, which allows the

construction of probabilistic propositions about the population, based on the observation of some of its sample elements [23].

### *Eligibility criteria*

After identifying the subjects to participate in the research, they then composed the general picture of the research, with a representation of both genders, aged between 18 and 60 years, and who were being attended or hospitalized at CAPS-AD Antônio Carlos Mussum and CAPS-AD Júlio César de Carvalho. Those individuals diagnosed with crack dependence comprised the CUD (Cocaine Use Disorder) group. And those diagnosed with alcohol dependence formed the AUD group (Alcohol Use Disorder). Both groups were categorized according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) [24] and were abstinent for a minimum interval of 24 hours and a maximum of 90 days. In addition, patients should be able to read, write, as well as sign an informed consent form, accepting inclusion in the research project. Individuals with another psychiatric diagnosis (such as psychosis) or somewhat chronic organic disease, for example, diabetes or other metabolic disorders, were excluded.

The study also included healthy individuals who did not have a history and/or criteria for the diagnosis of chemical dependency or other mental disorders, therefore, not being users and/or chemical dependents or presenting neuropsychiatric disorders, matched by sociodemographic characteristics (age, gender, schooling, socioeconomic level, etc.) that were used as controls (CONT group).

### *Cognitive function test: Instruments*

The participants included in the study underwent a previous psychiatric clinical evaluation by the CAPS-AD medical team, confirming the criteria for the diagnosis of chemical dependency. Thus, a structured interview was carried out to collect sociodemographic information and patterns of substance use. Healthy persons who were approved to be involved in the study also underwent cognitive tests, in addition to signing the consent form to participate in the research.

The Frontal Assessment Battery (FAB) assesses six different domains of executive function: conceptualization, mental flexibility, motor programming, and sensitivity to interference, inhibitory control, and autonomy. Each item is scored from zero to three, totalling eighteen points for the maximum score [25].

For tracking the individual's mental status, the cognitive scale of the Mini-Mental Status Examination (MMSE) from the original Mini-Mental Status Examination was used. This scale evaluates no less than five cognitive functions: orientation, registration, attention and calculation, evocation, and language [26].

For the specific clinical evaluation of alcoholic patients and crack cocaine users, an examination was performed to assess the intense desire (craving) for the drug, and for both alcoholics and CUD, scales were applied to assess the levels of depression and anxiety.

Craving was scored with a brief scale composed of 5 items (1, 2, 4, 5 and 13) adapted from the Obsessive-Compulsive Drinking Scale (OCDS) [27] for AUD, and the Cocaine Obsessive-Compulsive Scale (OCCS) [28] for CUD. Questions on this brief scale are answered on a scale ranging from 0 to 4, resulting in on a total score between 0 and 20.

The severity of depression symptoms was analyzed by a multiple-choice questionnaire (Hamilton Depression Rating Scale (HAM-D)). This appliance measures the severity of depression symptoms such as low mood, insomnia, agitation, anxiety, and weight loss. The examiner must choose among the possible answers to each question by interviewing the patient and observing the patient's symptoms. Each question has between 3 and 5 possible answers that increase in severity. In the original scale, the first 17 questions contribute to the total score, while questions 18 to 21 provide additional information about depression (e.g., diurnal variation, paranoid symptoms) but are not included in the total scale score [29].

The level of anxiety symptoms was assessed using a structured multiple-choice questionnaire (Hamilton Anxiety Rating Scale (HAM-A)). The scale consists of 14 items, each defined by a series of symptoms, and measures both psychic anxiety (e.g., mental agitation and

psychological distress) and somatic anxiety (e.g., anxiety-related physical complaints) [30].

### **Statistical analysis**

To compare data on sociodemographic idiosyncrasy between the CONT, CUD and AUD groups, non-parametric tests (chi-square) were performed. In all analyses, a significance level of  $p < 0.05$  was used. SPSS Statistics Base 24.0 (SPSS Inc, USA) was used for statistical analysis.

## **RESULTS AND DISCUSSION**

### ***Sociodemographic characteristics of research participants***

The sociodemographic characteristics of the CONT, AUD, and CUD groups are presented in Table 1. Schooling measured by years of study differed between groups, possibly due to the higher proportion of patients with secondary education in the AUD group, in contrast to the prominent quantity of subjects with higher education in the CONT and CUD groups.

The work situation was significantly different between the groups due to the higher proportion of unemployment and informal work, in contrast to the lower proportion of formal work in the CUD and AUD groups.

There was also a significant difference in marital status, as there was a higher proportion of married or in a stable relationship in the CONT and AUD groups, unlike most of the CUD group, composed of patients who were single or widowed.

The AUD group had a mean age (of 40.48387) superior to the CUD group (31.06897) and CONT group (34.73077), but without a significant difference when comparing them.

The sociodemographic characteristics of crack/cocaine and alcohol users showed strong statistical significance in the questions (current work situation [ $p$ -value 0.001]), education level [ $p$ -value 0.002], and marital status [ $p$ -value 0.003]. In such a way, it demonstrates that the dependents are not able to work, and thus be able to have an adequate social and family life, as well as they do not educate themselves, and end up not being able to maintain family ties.

**Table 1.** Socio-demographic characteristics of crack/cocaine and alcohol users (n=112); CAPS, Rio de Janeiro, Brazil, 2022.

Socio-demographic characteristics	GROUPS						p-value <sup>(c)</sup>
	CONT		CUD		AUD		
	(n=52)		(n=29)		(n=31)		
	n	%	n	%	n	%	
<b>Sex</b>							0.207
Male	43	82.69	23	79.31	28	90.32	
Female	9	17.31	6	20.69	3	9.68	
<b>Age (years)</b>							0.246
18-30	20	38.46	11	37.93	4	12.90	
31-49	14	26.92	12	41.38	11	35.48	
50-60	18	34.62	6	20.69	16	51.62	
<b>Marital status</b>							0.003*
Single, separated or widowed	19	36.54	21	72.41	9	29.03	
Married or lives with partner	33	63.46	8	27.59	22	70.97	
<b>Level of schooling (in years)</b>							0.002*
<8 (never went to school to incomplete junior high school)	7	13.46	6	20.69	27	93.10	
≥8 (complete junior high school to complete higher education)	45	86.54	23	79.31	4	12.90	
<b>Considers him/herself religious</b>							0.233
Yes	49	94.23	11	37.93	22	70.96	
No	3	5.77	18	62.07	9	29.04	
<b>Current work situation</b>							0.001*
Does not work	0	0.0	5	16.13	8	25.81	
Works (formally or informally)	52	100.00	24	83.87	23	74.19	
<b>Individual monthly income</b>							0.414
<1 minimum salary <sup>(a)</sup>	0	0.0	19	65.52	15	48.39	
≥1 minimum salary	52	100.00	10	34.48	16	51.61	
<b>A place where lived/slept in the 30 previous days</b>							0.533
No fixed address and others <sup>(b)</sup>	0	0.0	18	62.07	23	74.19	
Lives in his/her own house, in a partner's, friends' or in a rented house	52	100.00	11	37.93	8	25.81	

<sup>(a)</sup>In 2022, the minimum salary corresponded to R\$ 1212,00 (Approximately 232 US dollars). <sup>(b)</sup>Living on the streets, in shelters run by the government, hospitals, and treatment services or in prison on the 30 previous days. <sup>(c)</sup>p-value = Chi-square test (95% confidence interval). (\* p-value ≤0.05)

### Patterns of substance use

In this study, regarding drug use patterns, patients in the CUD and AUD groups showed medium/high use of alcohol (dose/day) and crack cocaine (stones/day) are presented in Table 2. However, despite the seriousness, they did not show significant relevance (*p-value*).

Subjects in the CUD and AUD groups showed severe performance for the FAB test and moderately global cognitive performance for the MMSE test. The CONT

group was satisfactory in all analyses.

The scores for assessing depression (HAM-D) were within the range considered normal for the CONT group but in the severe range for the CUD group and moderate for the AUD group. As for the anxiety scale (HAM-A), it is within the range considered normal for the CONT group but presented with moderate anxiety for the CUD and AUD groups.

Craving scores measured by the 5-item OCDS scales for alcohol or OCCS scales for crack cocaine were of mild to moderate intensity in both substance use disorders. The average scores on these scales were like those found in previous studies [31, 32]. These differences could be expected in the crack cocaine and alcohol-dependent population as social and behavioural consequences

usually found in substance use disorders.

Early initiation of crack use (before age 16) was reported by 06 research participants in the CUD group and, within the AUD group, 14 also reported early initiation of alcohol use. The average number of stones consumed *per day* was 17.4.

**Table 2.** Patterns of substance use on CONT, CUD, and AUD groups (n=112); CAPS, Rio de Janeiro, Brazil, 2022.

Characteristics of crack cocaine and alcohol consumption among participants	GROUPS						p-value
	CONT (n=52)		CUD (n=29)		AUD (n=31)		
	average	SD	average	SD	average	SD	
Amount of use (daily)	0	0.0	17.4 rocks/day	17,4	14.6 drinks/day	8.6	
Age of onset of drug use (years)	-		18.9	7.7	23.3	9.1	
<b>Clinical examination</b>							
FAB <sup>(a)</sup>	17.15	1.14	5.73	1.16	7.3	3.7	0.3126
HAM-D <sup>(b)</sup>	5.5	3.4	25.19	5.33	14.1	3.2	0.1522
HAM-A <sup>(c)</sup>	4.8	1.2	16.1	6.6	18.6	5.3	0.4344
MMSE <sup>(d)</sup>	24	2.3	15.7	4.2	13.2	3.9	0.6117
Craving scores <sup>(e)</sup>	2.2	1.1	15.2	4.2	14.9	3.8	0.2156
	n	%	n	%	n	%	
<b>Age at onset of alcohol use (years)</b>							
<16	-		-		14	45.16	
>16	-		-		17	54.84	
<b>Age at onset of crack use (years)</b>							
<16	-		6	20.69	-		
>16	-		23	79.31	-		

<sup>(a)</sup>Frontal Assessment Battery (FAB); <sup>(b)</sup> Hamilton Depression Rating Scale (HAM-D); <sup>(c)</sup>Hamilton Anxiety Rating Scale (HAM-A); <sup>(d)</sup> Mini-Mental State Examination (MMSE); <sup>(e)</sup>Craving scores (Minimum 0-11, Mild 12-16, Moderate 17-22; Severe  $\geq 23$ ); Standard deviation (SD); p-value = Chi-square test (95% confidence interval).

### Analysis of crack cocaine and alcohol users and controls

The predominance of men in chemical dependency treatment services verified here is a reality also present in other studies [33, 34]. National surveys on drug use have shown that the consumption rate is higher among men [35, 36].

The II National survey on the use of psychotropic drugs in Brazil investigated alcohol dependence by gender and concluded that alcohol dependence is approximately three times higher among men than among women [36]. However, the comparison of data from the two surveys has shown an increase in drug use among women, with a predominance of medication use, such as

benzodiazepines and stimulants [35, 36].

Among crack cocaine users, the prejudice faced is a complicating factor in the search for drug addiction care services. Social stigma and feelings of guilt and shame lead women to avoid exposing their problems and, consequently, seek treatment [37]. A study on adherence to treatment for alcohol and crack cocaine addiction showed that, in addition to low demand for treatment, abandonment is also more prevalent among women [38]. In the present study, there was a lower proportion of women in the third-month group compared to the treatment initiation group (15.5% and 20.1%,

respectively), indicating an even lower prevalence of women in more advanced stages of treatment.

The low level of education found among those dependent on alcohol and crack cocaine is in line with other studies in the area [37,39-41], which associate drug use with poor school performance, in addition to a higher rate of absenteeism [42]. Here, however, the low level of education may also be related to the characteristics of the clientele that seeks health assistance services [43].

Regarding marital status, among the group that was starting treatment, most declared themselves to be unmarried (single, divorced, or widowed), while in the group in the third month of treatment, most declared themselves to be married, however with no difference significant. When asked who they lived with, most of the interviewees, in both groups, mentioned living with a family member or friend. Thus, although most individuals undergoing treatment at CAPS-AD are included among the lowest income strata, individuals who arrive at CAPS-AD treatment are, for the most part, people who have some social support network. And minimum living conditions, such as housing. Homeless people or public shelters accounted for only 1.5% of the sample. Another study also highlights that drug addicts with greater social commitment do not seem to reach health services and points to the need for municipalities to implement strategies to facilitate access, with greater involvement of community health agents, with the Harm Reduction Programs or with the Street Clinics, or other actions to bring the community closer to services<sup>13</sup>. In addition, the model in which the gateway to treatment is the Health Unit ends up making access more difficult for those in greater social vulnerability.

The main socioeconomic and demographic difference between the two studied groups was related to age. Studies that evaluated adherence to treatment for alcohol or crack cocaine addicts found that the length of stay in rehabilitation Centers is directly proportional to age [44]. Alcohol is a drug used by many poliusers to enhance or inhibit the effects of other drugs. Its ingestion, associated with crack or cocaine, for example, reinforces its effects, with the user tending to consume increasing doses of both when used in combination. In the case of crack cocaine consumption, alcohol is later used to reduce the

feeling of dry mouth and alleviate other undesirable effects [45]. In addition, an important characteristic of crack cocaine users is the simultaneous use of multiple drugs. Thus, the individual hardly consumes the drug in isolation, associating it mainly with alcohol, marijuana, and tobacco, which makes it difficult to measure the aggregate damage to these various associations [44].

Another relevant finding about crack was the prolonged time of its use by the respondents. Of those who claimed to have used the drug, most reported consumption for more than 10 years. The authors point out the changes that the drug has undergone over the years as the cause of this longevity of use. To increase profitability, diluents are added, resulting in more "impure" preparations and, consequently, with less addictive potential. Another feature is its greater fractionation, enabling lower prices and greater dissemination. Another factor pointed out is that, although intensified use is still the most prevalent, some individuals manage to develop unique strategies to maintain continued patterns of consumption at moderate levels [46].

The low number of drug-dependent women undergoing treatment at CAPS-AD reveals the importance of strategies, within the scope of primary care, that can create conditions for them, first, to access the service and, subsequently, to appropriate the necessary treatment, so that they can find the support they need for their recovery. In this sense, the service must consider the singularities of women, considering the aspects that permeate the universe of drug users. Likewise, attention is needed to the treatment process of younger patients, through the development and execution of specific actions that encompass attraction and maintenance in treatment.

Regarding drug use patterns, this study was able to demonstrate that most CAPS-AD patients use, throughout their lives, various types of psychoactive substances, some with sporadic use or experimentation characteristics, and others with characteristics of prolonged, frequent, and recent use, such as alcohol and crack cocaine.

Due to its easy access, alcohol, a licit drug, is the most consumed by CAPS-AD patients. There are several health problems already related to this drug. In this

sense, the importance of prevention actions for abuse of this drug in the general population is highlighted, as well as specific strategies that address the problem of abuse of licit drugs by CAPS-AD patients, even among those whose main motivator of a search for treatment were illicit drugs.

### CONCLUSIONS

The results obtained in the research showed that the users of alcohol and drugs participating in the research presented a worse result in the fields of attention/calculation, evocation memory and time/spatial orientation. This fact corroborates the hypothesis that the chronic use of alcohol and crack cocaine affects more directly prefrontal and temporal brain regions and the forebrain, areas responsible for abstract thoughts and planning, associations of thoughts and memories, attention, verbal fluency, memory visual, verbal memory, learning ability and executive functions.

The main contribution of this research is the production of information about the characteristics of the public served by the CAPS-AD, which can support the development of effective strategies for the treatment and detection of specific vulnerable groups. It is also important for revealing a repressed demand, that is, users who do not seek or, for various reasons, do not arrive at the CAPS-AD. Thus, new studies are needed to understand why certain groups, such as women and homeless people, do not access the CAPS-AD, and the reasons why groups with certain characteristics do not remain in treatment.

Reflecting the importance of the subject, it is expected that the issues raised in this study will be deepened in future studies, contributing to new debates on the subject, since drug addiction is a chronic disease, with difficult recovery. In addition, with the results of this study, it is expected that the health care offered by professionals working in the CAPS-AD, given their proximity to the patient and their role in health education actions, can provide better care. quality. and as comprehensive as possible, considering the factors described here that influence drug use, cause dependence, and make it difficult to abandon use.

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### ETHICAL CONSIDERATION

The present work had the approval of the Committee of Ethics in Research of the Sergio Arouca National School of Public Health (ENSP/FIOCRUZ).

### Conflicts of interest

The authors declare no conflicts of interest.

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