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BRIEF COMMUNICATION

Crack-cocaine users have less family cohesion than alcohol users

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Objective: Many studies correlate characteristics of family functioning and the development of drug addiction. This study sought to evaluate and compare the family environment styles of two groups of psychoactive substance users: 1) alcohol-only users and 2) crack-cocaine users.
Methods: Three hundred and sixty-four users of alcohol, crack-cocaine, and other drugs, recruited from research centers in four Brazilian capitals participated in this study. Subjects were evaluated through the Family Environment Scale and the Addiction Severity Index, 6th version (ASI-6). ASI-6 *t*-scores were compared by analysis of variance (ANOVA) and post-hoc tests. A final model was obtained using a logistic regression analysis. All analyses were adjusted for partner, age, and psychiatric *t*-score.
Results: We found a significant difference between groups in the cohesion subscale ($p = 0.044$). The post-hoc test revealed a difference of 1.06 points (95%CI 0.11-2.01) between groups 1 (6.45 ± 0.28) and 2 (5.38 ± 0.20). No significant between-group differences were observed in the other subscales. However, categorical analyses of variables regarding family dynamic showed that crack users more often reported that sometimes people in their family hit each other (30.4% vs. 13.2%, $p = 0.007$) and that people in their family frequently compared each other regarding work and/or school achievement (57.2% vs. 42.6%, $p = 0.041$).
Conclusion: These results suggest that families of crack-cocaine users are less cohesive than families of alcohol users. This type of family environment may affect treatment outcome, and should thus be adequately approached.

Keywords: Family; family relationships; cohesion; substance abuse; alcohol use; crack-cocaine use

Introduction

Environmental factors, especially the family environment, are strongly associated with onset of substance use.[1] Within the conceptual framework that integrates environment, behavior, social contexts, and individuals, these elements influence each other mutually by dynamic processes.[2] From a developmental perspective, substance use disorders (SUDs) arise from an interplay of genetic and environmental factors, both of which have family as a common entity.[3] In this respect, aspects related to family structure and the dynamics of family life serve as both protective and risk factors for initiation and further development of problem drug use.[2-5]

Once an SUD is established, it is known to adversely affect several aspects of family life, by factors such as the user's detachment and isolation from real life, aggressive behavior that may include physical violence, lack of interest in peer social activities not related to drug use, and a range of negative emotions (e.g., fear, anger, frustration, and resentment).[5-7] Such an unstable environment lacks the resources needed to provide social support, hindering the ability of family members to form healthy and fulfilling relationships, thereby affecting the mental and physical health of all individuals.[8] Conversely, family engagement in treatment has a direct impact on prognosis, as affection and support from the family may in turn improve treatment adherence and outcomes.[9]

In Brazil, it is estimated that 28 million people live with someone who has an SUD.[10] However, studies of families with SUDs are still scarce in the country. Some studies have reported impaired family functioning due to drug abuse by a family member. Vianna et al.[11] analyzed the family functioning of drug addicts compared to a control group and found that families with a substance abuser have problems in greater number and severity than do families without substance-abusing members. Given the large number of people in Brazil affected by the

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SUD of a family member or peer, it is relevant to further examine the family environment of substance abusers and determine whether there are differences in family environment depending on the substance of abuse. Within this context, the present study aimed to examine and compare the family environment of alcohol users and crack-cocaine users.

Methods

Study design

This was a multicenter cross-sectional study.

Sample

A total of 364 users of alcohol, crack cocaine, and other drugs were recruited from research centers located in four Brazilian state capitals: Porto Alegre (RS), Salvador (BA), São Paulo (SP), and Rio de Janeiro (RJ). The participants were selected by convenience sampling at the four centers for inpatient and outpatient treatment for substance abuse. The participating centers were selected by Secretaria Nacional de Políticas sobre Drogas (SENAD) also by convenience, taking into account their logistic capacity and research efficiency.

Participants and setting

Study participants were adults with a history of recent alcohol or drug use who were recruited from psychiatric inpatient units or outpatient clinics specializing in the treatment of substance abuse. Limited exclusion criteria were used so as to enable the investigators to evaluate and differentiate substance-abusing patients at different stages of substance use and treatment.

The inclusion criteria were age $>$ 18 years and having undergone evaluation or treatment in an outpatient and/or inpatient unit specializing in the treatment of substance abuse/addiction – for outpatients, at the beginning of treatment (maximum of 2 weeks) and with a history of alcohol or drug use in the past 30 days; for inpatients, within the first 10 days of admission, with the interview being conducted before admission.

Exclusion criteria were: presence of severe psychiatric disorders with symptoms at the time of interview (psychotic symptoms, severe cognitive deficits, altered state of consciousness, psychomotor agitation requiring restraint, severe withdrawal symptoms, or acute effects of substance use) that would preclude interview; or refusal to participate in the study or to give consent.

Instruments

Addiction Severity Index, 6th version (ASI-6)

The ASI-6 is a fairly complete and relatively brief instrument designed to provide important information on several potential problem areas in substance-abusing patients, which are often related to substance abuse and addiction. It is widely used in both research and clinical practice not only in the United States but also in other countries to evaluate adult users of alcohol and other drugs.

Family Environment Scale (FES)

The FES consists of 10 subscales that measure the actual, ideal, and expected social environment of families. The 10 subscales measure three underlying dimensions: Relationship, Personal Growth (or Achievement Orientation), and System Maintenance. The Relationship and System Maintenance dimensions basically reflect internal family functioning, while the Personal Growth dimension reflects the connections between the family and the larger social context. In the present study, we used the Real Form of the FES (Form R), designed to assess the current environment, to describe the actual family environment at the time of assessment. The scale consists of 90 statements designed to measure the perceptions of each family member of their actual family environment, i.e., the social and interpersonal family climate. Respondents are asked to score each statement about their family environment as true or false.

The participants' sociodemographic variables and psychiatric scores were evaluated using the ASI-6. Two groups (alcohol only and crack + other drugs) were defined using the ASI-6 and categorized on the basis of the d34, d35, and d36 variables of the interview.

These instruments have been validated in Brazil by the authors of the respective publications.[11,12]

Statistical analysis

Multiple logistic regression analysis was performed to determine which variables affected substance use and family cohesion. Scores were compared using post-hoc ANCOVA for significant mean differences. Data were expressed as mean $\pm$ standard deviation or median and interquartile range (IQR). Statistical analysis was performed in PASW version 18.0, and the level of significance was set at 5% ($p < 0.05$).

Ethical considerations

The study was approved by the institutional review board (IRB) of Hospital de Clínicas de Porto Alegre (GPPG-HCPA) and by the IRB of each participating research center. Ethical procedures were followed to ensure that the rights and well-being of participants were protected. Written informed consent was obtained from participants prior to their inclusion in the study.

Results

Sociodemographic characteristics

The main results are listed in Table 1. A total of 364 substance-abusing patients were included: 69 in the alcohol-only group and 295 in the crack + other drugs group. The two groups were similar in terms of educational attainment and sex, but differed significantly in age

($p < 0.001$). Alcohol-only users had a significantly higher mean age (47.8±8.8 years) than crack-cocaine users (crack + other drugs, 32.7±9.5 years). In addition, 67% of crack-cocaine users reported not having a partner, which differed significantly between the two groups ($p = 0.001$). The alcohol-only group had a higher gross income (median: $6,600, IQR: $2,000-$12,000) than the crack + other drugs group (median: $3,000, IQR: $1,050-$6,185) ($p < 0.05$). Crack-cocaine users also had significantly higher psychiatric scores (crack + other drugs, 50.8± 8.5) than alcohol-only users (48.0±7.5) ($p < 0.05$).

Characteristics related to alcohol and drug use

Table 2 shows the pattern of alcohol and drug use. For every 1-year increase in patient age, patients had a 12% greater chance of using only alcohol than using crack cocaine and other drugs. For every 1-day increase in alcohol use (variable unit), patients had a 4.2% greater chance of using only alcohol than using crack cocaine and other drugs. For every 1-year and every 1-day increase in drug use (variable unit), patients had, respectively, a 9.0% and a 7.6% lower chance of using only alcohol than using crack cocaine and other drugs. For every one-point increase in the Cohesion score, patients had a 27.7% greater chance of using only alcohol than using crack cocaine and other drugs.

Family Environment Scale (FES)

Table 3 shows the mean scores obtained by the two groups in each subscale evaluated. The Cohesion subscale, which is included in the Relationship dimension and refers to the degree of commitment, help, and support family members provide for one another, showed a significant difference in mean scores between the two

Table 1 Sociodemographic characteristics of alcohol and crack-cocaine users (n=364)

	Alcohol (n=69)	Crack cocaine (n=295)	p-value
Gender			
Male	55 (79.7)	248 (84.1)	0.488
Female	14 (20.3)	47 (15.9)	
Age (years)*	47.8 (8.8)	32.7 (9.5)	< **0.001**
Ethnicity			
White	42 (60.9)	147 (49.8)	0.129
Non-white	27 (39.1)	148 (50.2)	
Has partner			
Yes	38 (55.1)	97 (32.9)	**0.001**
No	31 (44.9)	198 (67.1)	
Outpatient treatment			
Yes	35 (50.7)	138 (46.8)	0.648
No	34 (49.3)	157 (53.2)	
Education (primary or secondary)			
Yes	47 (68.1)	219 (74.2)	0.378
No	22 (31.9)	76 (25.8)	
Income (last 6 months)†	6,600 (2,000-12,000)	3,000 (1,050-6,185)	**0.010**
Psychiatric *t*-score, ASI*	48.0 (7.5)	50.8 (8.5)	**0.012**

Data presented as n (%).
ASI = Addiction Severity Index.
Bold font indicates statistical significance.
* Variable presented as mean (standard deviation) and compared by the *t*-test for independent samples.
† Variable presented as median (interquartile interval) and compared by the Mann-Whitney test.

Table 2 Characteristics of alcohol, other drug, and medication intake (n=364)

	Total	Alcohol (n=69)	Crack cocaine (n=295)	p-value*
Years using alcohol†	9.9 (11.0-6.0)	20.0 (6.0-28.0)	4.0 (0.0-13.0)	< **0.001**
Years abusing alcohol‡	8.1 (10.0-4.0)	10.0 (4.0-23.0)	3.0 (0.0-10.0)	< **0.001**
Alcohol use in the last month (days)	11.6 (11.3-8.0)	20.0 (10.0-30.0)	5.0 (1.0-16.0)	< **0.001**
Binge drinking (days)	9.6 (11.4-4.0)	15.0 (4.0-26.0)	2.0 (0.0-15.0)	< **0.001**
Years of drug use and/or medication abuse†	8.9 (8.8-7.0)	0.0 (0.0-1.0)	10.0 (4.0-15.0)	< **0.001**
Drug or medication use in the last month (days)	13.1 (12.4-10.0)	0.0 (0.0-0.0)	15.0 (4.0-30.0)	< **0.001**

Data presented as median (quartile interval: 25th percentile-75th percentile).
Bold font indicates statistical significance.
* Mann-Whitney test.
† Regular use for 3 or more days per week;
‡ Abuse: five or more drinks a day for 3 or more days per week.

Table 3 Family functioning scores of alcohol and crack-cocaine users in the Family Environment Scale (n=364)

	Total	Alcohol (n=69)	Crack cocaine (n=295)	p-value*	p-value†
Cohesion	5.7 (1.8)	6.1 (1.5)	5.6 (1.9)	**0.044**	**0.035**
Expressiveness	5.6 (1.7)	5.8 (1.9)	5.6 (1.7)	0.499	0.271
Conflict	4.5 (1.5)	4.3 (1.3)	4.5 (1.5)	0.375	0.892
Independence	5.4 (1.6)	5.7 (1.5)	5.4 (1.6)	0.155	0.780
Achievement orientation	5.5 (1.7)	5.5 (1.6)	5.5 (1.8)	0.984	0.628
Intellectual-cultural orientation	5.0 (1.5)	5.1 (1.5)	5.0 (1.5)	0.549	**0.030**
Active-recreational orientation	4.7 (1.5)	4.8 (1.6)	4.7 (1.5)	0.671	0.467
Moral-religious emphasis	5.5 (1.6)	5.6 (1.5)	5.6 (1.6)	0.868	0.864
Organization	5.4 (1.8)	5.7 (2.2)	5.4 (1.8)	0.119	0.125
Control	5.4 (1.7)	5.6 (1.5)	5.3 (1.7)	0.327	0.245

Data presented as mean (standard deviation).
Bold font indicates statistical significance.
* *t*-test for independent samples.
† ANCOVA; analyses adjusted by income.
All analyses were adjusted for partner, age, and psychiatric *t*-score.

Table 4 Categorical variables of family dynamics among alcohol and crack-cocaine users (n=364)

	Alcohol (n=69)	Crack cocaine (n=295)	p-value*
We put a lot of effort in our activities at home	55 (80.9)	205 (69.5)	**<0.001**
How much a person earns is not important in my family	50 (73.5)	207 (70.2)	**<0.001**
People in my family rarely lose self-control	45 (67.2)	155 (52.7)	**0.044**
In our family to be punctual is very important	57 (83.8)	202 (69.2)	**0.023**
Sometimes people in my family hit each other	9 (13.2)	88 (30.4)	**0.007**
If there are any disagreement in our family we try really hard to temper things in order to maintain peace	60 (89.6)	220 (75.3)	**0.018**
We really get along with each other	54 (79.4)	183 (63.1)	**0.016**
People in my family are frequently compared to other people regarding work and/or school achievement	29 (42.6)	166 (57.2)	**0.041**

Data presented as n (%).
Bold font indicates statistical significance.
* Chi-square test.

groups (p = 0.044). In addition, post-hoc analysis revealed a difference of 1.06 points between the two groups for family cohesion. In all other subscales, there was no significant difference in mean scores between the two groups.

Family characteristics

The family characteristics of the two groups are shown in Table 4. In the alcohol-only group, 67% of patients reported that their family members hardly ever lose their tempers, as compared with 52% of patients in the crack + other drugs group. Most alcohol users (84%) reported that being on time is very important in their family, as compared with 69% of crack-cocaine users. In the alcohol-only group, only 13% of patients reported that their family members sometimes hit each other, while in the crack + other drugs group, 30% reported episodes of this type. Regarding family attempts to solve problems of interpersonal relationships, such as "if there is a disagreement in the family, they try to smooth things over and keep the peace," the results were significant in both groups ($p < 0.01$). In the alcohol-only group, 43% of patients reported that, in their family, family members are often compared with others as to how well they are doing at work or school, vs. 57% of patients in the crack + other drugs group.

Discussion

This is one of the first studies to evaluate the family environment in a multicenter sample of adult substance users in Brazil. The main finding was that crack-cocaine users seeking treatment, regardless of the use of other psychoactive substances, have less family cohesion than alcohol-only users. Family cohesion refers to the ability of family members to provide support for one another.[11] According to Cohen,[13] social support provides an individual with the psychological and material resources needed to cope with stressful life events. Thus, this result suggests that crack-cocaine users were more likely to perceive their families as lacking adequate resources for social support. Although no definite conclusion is yet possible, we hypothesize that these families already had weak emotional attachments before the initiation of substance use, and that the chronic use of a highly addictive drug, such as crack cocaine, may have driven the family members further apart.

The validation study of the FES for Portuguese has defined that the Cohesion subscale belongs to the Interpersonal Relationship dimension, which measures the degree of mutual help and support among family members. In that study, the authors reported a higher Cohesion score for Brazilian functional families as compared to families of five international studies and hypothesized that this might be due to cultural differences.[11] Literature data

suggest that an unstructured family environment is a risk factor for relapse in SUD and is associated with a greater severity of dependence.[14] The establishment of healthy emotional bonds between parents and children, for example, based on responsibilities, limits, support and affection, is a protective factor against drug use.[9] The present study showed that crack-cocaine users have poorer family functioning in relation to personal commitment and have weaker family ties than do alcohol-only users, which may contribute to low family cohesion and the choice of hard drugs, such as crack cocaine.

A further point of discussion is that the systematic use of crack cocaine interferes with several aspects of an individual's life, hindering interpersonal relationships and weakening social and family ties. Evidence shows that, in severe cases, interpersonal ties may be broken, leading to progressive isolation and marginalization of substance users.[6] Santis et al.,[15] in a study of cocaine users in Chile, found that 73% of the participants perceived their family as dysfunctional, reporting difficulty with communication and emotional attachment, few family rituals, and a weak hierarchical structure. Moura et al.[16] evaluated family problems among drug users in Brazil and found that crack-cocaine and cocaine users showed more problems, including arguing and difficulty in getting along with partners, than other drug users.[16] Crack-cocaine users also showed higher rates of occupational, family, and legal problems than other substance users,[17] and were more likely to be unmarried.[18] Given the importance of social support and the quality of social relationships for mental and physical health, this conflicting family atmosphere represents a risk factor for mental and clinical illness.[8]

Another important finding of the present study was a difference in psychiatric scores between the two groups, with crack-cocaine users showing higher scores for psychiatric disorders. Evidence shows that the family environment since childhood can be an important factor in the clinical manifestation and natural history of psychiatric diseases.[19] A study evaluating children with externalizing symptoms and/or conduct disorders, which are directly related to the use of psychoactive substances, showed an association of these conditions with the presence of family adversities.[20]

The present study also showed a higher frequency of aggressive behavior in the families of crack-cocaine users. Our findings are consistent with those of a recent study reporting high rates of occupational, family, and legal problems in populations of crack and cocaine users when compared to non-cocaine psychoactive substance users.[17] Other studies evaluating impulsivity and aggression in cocaine users have shown that, even without a diagnosis of antisocial personality disorder (APD), cocaine users are more impulsive and aggressive than controls.[21] In addition, individuals with a diagnosis of both SUD and APD have increased impulsivity.[21] Also worth noting are the long-term neurobiological and structural changes caused by crack-cocaine use, such as dysfunction of electrophysiological and metabolic activities in the prefrontal cortex.[22] Functional problems in this brain region can result in higher levels of impulsivity, which may in turn reinforce rigid, inflexible, and less adaptive responses to real-life events.[23]

This study has some limitations. First, not all Brazilian regions were included in our multicenter design, producing a sample that was not representative of the country as a whole. Second, the sample was limited to patients seeking treatment at specialized public facilities. Third, few women and few people facing legal problems were included in the study. Fourth, the research design did not include a control group, which prevented us from analyzing the family functioning of psychoactive substance users compared to families without substance-abusing members. Finally, due to the cross-sectional design of the study, it is not clear whether family cohesion problems occur as a cause or as a consequence of SUD. In this respect, we plan to conduct further studies involving all these populations to address this issue.

In conclusion, our results suggest that crack-dependent patients, regardless of whether they use other substances, have less family cohesion than alcohol-dependent patients. While confirmation is needed, we hypothesize that these families already had weak bonds between family members, which may have contributed to initiation of drug use. Moreover, the chronic and long-term use of a hard drug, such as crack cocaine, may have further disengaged family members from the drug users. In practice, these family circumstances may have an impact on recovery outcomes in drug-dependent patients. It is therefore important to understand the family system of drug-dependent patients in order to provide adequate treatment that is tailored to individual family problems as a therapeutic resource to enhance recovery. In the same vein, it is also important to identify the patient's family lifestyle so that treatment can be tailored to specific aspects related to family structure, thus engaging family members in the treatment process and potentially improving outcomes.

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Disclosure

The authors report no conflicts of interest.

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