Sexual risk behaviors in non-injecting substance-dependent Brazilian patients

Comportamientos sexuales de riesgo en pacientes brasileños dependientes de drogas no inyectables

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Resumen

Este estudio pretende evaluar los comportamientos sexuales de riesgo en pacientes dependientes de sustancias no inyectables admitidos en hospitalización especializada brasileña. Se realizó un estudio transversal con información sociodemográfica, información sobre el comportamiento sexual, droga de elección y se les aplicó el Short Alcohol Dependence Data, Drug Abuse Screening, Test for Nicotine Dependence. La muestra fueron 299 sujetos con distintos niveles de vulnerabilidad sexual medida combinando el número de parejas sexuales con la frecuencia de uso del condón en sus relaciones sexuales durante el último año. Los resultados muestran que entre los sujetos del grupo de alto riesgo aproximadamente un 39% tuvieron también una mayor prevalencia de otros comportamientos sexuales de riesgo, como sexo con prostitutas (RR1.96), experiencias homosexuales y experiencias homosexuales a cambio de drogas, historia de infecciones de transmisión sexual (RR1.39), realización de la prueba del VIH, uso de la píldora del día después (RR1.78) y aborto inducido. La probabilidad de que los usuarios de alcohol o cocaína tuvieran un comportamiento sexual de alto riesgo fue 2.47 y 1.66 veces respectivamente más alta que los consumidores de crack. Además, los usuarios con niveles sustanciales o graves de problemas de drogas tenían 3.64 veces mayor probabilidad de comportamiento sexual de alto riesgo. Identificar, prevenir y gestionar las conductas sexuales relacionadas con el consumo de alcohol y otras de drogas es una excelente oportunidad para fortalecer su tratamiento.

Palabras Clave: comportamiento sexual, trastornos relacionados con sustancias, preservativos, parejas sexuales, crack / cocaína.

Abstract

This study seeks to evaluate sexual risk behaviors in non-injecting substance-dependent patients admitted for specialized inpatient Brazilian care. A cross-sectional study using socio-demographic and sexual behavior information, drug of choice, Short Alcohol Dependence Data, Drug Abuse Screening, and Test for Nicotine Dependence was used in 299 subjects with different levels of sexual vulnerability as measured by the number of sexual partners in the last year and the frequency of condom use with intercourse/penetration. The findings showed that approximately 39% the subjects of the high risk sexual behavior group exhibited a higher prevalence of others sexual risk behaviors, including having sex with sex workers (RP=1.96), homosexual experiences, and homosexual experiences in exchange for drugs, history of STIs (RP=1.39), HIV testing, use of the morning–after pill (RP=1.78) and induced abortion. The probability of alcohol and cocaine snorted user having high risk sexual behaviors is 2.47 and 1.66 times respectively higher than crack users. In addition, users with substantial or severe levels of problems with drugs had a probability of 3.64 times greater of high risk sexual behaviors. Identifying, preventing, and managing these high risk sexual behaviors related to alcohol and other drugs are an excellent opportunity to bolster their treatment.

Key Words: sexual behavior, substance-related disorders, condoms, sexual partners, crack/cocaine

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Substance-dependent patients are a particularly complex population with regard to sexual risk behaviors. Within this population, sexual risks vary with the type of drug used, route of administration, social context, gender, sexual orientation, and type of sexual interaction (Celentano, Latimore, & Mehta, 2008). Many clinical reports, including a few Brazilian studies, have reported elevated rates of unprotected sex in this population (Malta et al., 2010; Nappo, Sanchez, & De Oliveira, 2011; Remy et al., 2013). Twenty-nine studies targeting substance-dependent patients were identified in a systematic review and meta-analysis conducted by Malta et al. (2010) with 13 063 participants in Brazil from 1999 to 2009. Those studies consistently recognized injecting drug user (IDUs) and needle sharing as key predictors of HIV-infection as well as engagement in sex work and male-to-male sex. The findings showed that the combined HIV prevalence across the studies aimed at drug users was 23.1% (95% confidence interval (CI): 16.7-30.2), and 38.3% of subjects with occasional partners never or almost never used condoms (Malta et al., 2010).

Programmes to prevent HIV transmission among drug users have focused primarily on IDUs. These programmes have produced measurable reductions in HIV incidence and prevalence (Booth et al., 2009; Do et al., 2012). However, the majority of substances abusers worldwide are non-injecting drug users (non-IDUs), and there has been a scarcity of HIV prevention interventions strategies targeting non-IDUs (Shoptaw et al., 2013).

This reality has become a new focus of research due to the role unprotected sex plays in the transmission of HIV and other sexually transmitted infections (STIs) in non-IDUs. With the advent of crack smoking in the early 1990s, this changed the technology of use of cocaine administration among users worldwide (Dickson-Gomez, McAuliffe, Rivas de Mendoza, Glasman, & Gaborit, 2012; Dunn & Laranjeira, 1999; Nappo et al., 2011). Among female Brazilian crack users, for example, the growing number of recorded cases of HIV infection may be associated with the development of sexual risk behaviors involving the exchange of sexual favors for drugs or money (Nappo et al., 2011). These users generally exchange sex when craving for drugs and leave the use of protection up to the client, engaging in several sexual activities per day in unsafe locations, and with multiple partners (Nappo et al., 2011).

While cocaine and heroin have been reported to both increase and depress sexual arousal in men and women, methamphetamine has been reported to increase libido and the number of sexual partners, particularly in men who have sex with men (Kopetz et al., 2010; Benotsch et al., 2012). Methamphetamine use among non-IDUs has been associated with a number of HIV risk behaviors, including sex with multiple partners and decreased condom use due to the loss of inhibitory control (Frohmader, Bateman, Lehman & Coolen, 2010; Wechsberg et al., 2010).

Drug users, in the context of the Club scene, are another population that has dramatically increased over the last two decades according to the latest World Drug Reports (UNODC, 2013). Some studies have documented a higher prevalence of inconsistent condom use and multiple sexual partners among club drug users compared with the general population (Ibanez, Kurtz, Surrat, & Inciardi, 2010; Zuckerman & Boyer, 2012). In a Brazilian study conducted by Remy et al. (2013) with 240 club drug users, 80% reported having used alcohol/drugs to make sex last longer, 52.5% reported having had unprotected sex, 63% reported having more than two sex partners, 40% reported having had anal sex, and 15% had exchanged money for sex or sex for money (sex trading) in the 12 months prior to the interview. Finally, 84% reported having had sex with a man who most likely had had sex with another man in the 12 months prior to the interview (Remy et al., 2013).

High levels of marijuana dependence and sexual risk behaviors have been reported among youths. Recent evidence suggests an association between marijuana use and erectile dysfunction in men and risky sexual behaviors such as premature sexual intercourse, non-condom use, and an increased number of sexual partners in men and women (Aversa et al., 2008; Eloi-Stiven, Channaveeraiah, Christos, Finkel, & Reddy, 2007; Hendershot, Magnan, & Bryan, 2010; Saso, 2002).

All of the above psychoactive substances cause impaired cognitive functioning, poor decision-making capacity, and diminished judgment and perception, which increase the susceptibility of engaging in sexual risk behaviors (Kopetz, Reynolds, Hart, Kruglanski, & Lejuez, 2010). Among drug users, greater perceived risk of HIV/STI and positive attitudes regarding the effects of condoms on sexual pleasure have been shown to be associated (Mitchell & Latimer, 2009; Weinstock, Lindan, Bolan, Kegeles, & Hearts, 1993) with an increased probability of reporting condom use. Common reasons for not using condoms include lower perceived risk of contracting HIV/STI, negative attitudes regarding the effects of condoms on pleasure, cravings, high sexual arousal, being under the influence of drugs, difficulty convincing partners to use condoms, and lack of condom availability (Mitchell & Latimer, 2009; Weinstock et al., 1993).

Despite the abundant of the literature on sexual behaviors and drug abuse, few studies in Brazil have explored the prevalence of unprotected sexual intercourse in non-IDUs and their associated sexual behaviors with respect to gender in a clinical setting (Barbosa Júnior, Szwarcwald, Pascom, & Souza Júnior, 2009; Bassols, Boni, & Pechansky, 2010; Cortez, Boer, & Baltieri, 2011; de Souza, Diaz, Sutmoller, & Bastos, 2002; Malta et al., 2010; Nunes, Andrade, Galvão-Castro, Bastos, & Reingold, 2007). This lack of information justifies expanding the available national evidence because such studies are necessary due to the unique characteristics and risky sexual practices among men and women with substance-related disorders (Dickson-Gomez et al., 2012; Nappo et

al., 2011; Wechsberg et al., 2010). There are also significant gender differences in substance-related epidemiology, social factors, characteristics, biological responses, progression and level of dependence, clinical consequences, co-occurring psychiatric disorders, and barriers to treatment entry, retention, and completion (Tuchman, 2010).

Our hypothesis is that the prevalence of high-risk sexual behaviors is high among psychoactive substance-dependent individuals and that such high-risk sexual behaviors correlate with the severity of dependence. The objective of this study was to evaluate high-risk sexual behaviors in a sample of substance-disorder patients admitted in an inpatient addiction unit.

Method

This study involved a cross-sectional design and was conducted at an inpatient addiction treatment unit in Sao Paulo, Brazil. The sample comprised consecutive admissions of 616 users of psychoactive substance aged 18 years of age or older with a confirmed clinical dependence diagnosis according to the DSM-IV-TR diagnosis criteria (American Psychiatric Association, 2000). Subjects were selected on the basis of having different levels of sexual vulnerability as measured by the number of sexual partners (up to 2 and 3 or more) in the last year and the frequency (always use or use sporadically / never uses) of condom use with intercourse/penetration (vaginal, anal, and/or oral). Analyses were conducted on the interviews provided by 299 participants. The remaining subjects were excluded due to risk behaviors sexual intermediary avoiding such extensive sample stratification.

A two-step cluster analysis was performed first, but it proved to be a poor indicator for real-world patients because it established a cutoff point of 25 sexual partners. Therefore, the groups were divided by assuming a cut-off point of two sexual partners, which corresponded to the sample's second tertile and 67% of the participants.

The subjects were separated into two groups, classified as low sexually vulnerable, composed by subjects who had up to two sexual partners and reported using condoms during every sexual encounter in the past year ($N = 181$), denominate GR1. And the other, classified as highly sexually vulnerable subjects who had three or more sexual partners in the past year and reported either never using condoms or using them sporadically ($N = 118$) the GR2.

The patients were interviewed up to two weeks after admission. Data collection was conducted by four members of the staff who were previously trained to apply the questionnaire of this study. No refusals were recorded. This study was approved by the Federal University of Sao Paulo (UNIFESP) Ethics Committee (protocol number 1193/09), and all the subjects signed an informed consent form. The patients did not receive any refunds or compensation for participating in this study.

A structured questionnaire containing socio-demographic information, sexual behavior information, Drug of choice (DOC), Short Alcohol Dependence Data (SADD), Drug Abuse Screening Test (DAST-20) and The Fagerström Test for Nicotine Dependence (FTND) was used. The socio-demographic data included age, educational level, ethnicity, marital status, monthly income, employment status, and religious affiliation.

Sexual behavior information. These questions assessed patients' sexual activity in the past 12 months; frequency of condom use (always, sometimes, never) with penetration (oral, vaginal and/or anal) in the past 12 months; number of lifetime sexual partners; lifetime history of sex with sex workers; sexual orientation (hetero, homo and bisexual); homosexual experiences in exchange for drugs in the past 12 months; history of STIs; HIV testing; induced abortion (in female patients; in male patients, induced abortion in a corresponding sexual partner); sexual intercourse per week; use of the morning-after pill in the lifetime (only for female gender); and age at the time of first intercourse with penetration. The formulated questions were based on two Brazilian research studies (Abdo, 2004; Berquó & Barbosa, 2008).

Drug of choice (DOC) refers to the misuser's preferred drug. This information was elicited directly by the question: "What is your drug of choice?" Although substance users often meet the diagnostic criteria for dependence on multiple drugs, DOC is usually included in the clinical status of the patient because it helps to identify user profiles for the provision of appropriate case management (Clark et al., 2012). Considered poly drug user the individual who failed to set his/her drug of choice and has more than three drugs (licit and illicit) abuse as their preference is considered as a poly drug user.

Characteristics related to the treatment of the substance-related disorder. The duration of substance abuse and the number of previous treatments excluding the present one were elicited.

Short Alcohol Dependence Data (SADD). The Short Alcohol Dependence Data (SADD) consisted of 15 questions related to severity of alcohol dependence. The severity was classified on a scale from 0 to 20 and was scored as follows: mild (0-9), moderate (10-19), and severe alcohol dependence (≥ 20). The Brazilian version of the SADD and the original English version are highly correlated, and the coefficient of internal consistency is 0.79 (Rosa-Oliveira et al., 2011).

Drug Abuse Screening Test (DAST-20). The Drug Abuse Screening Test (DAST) consisted of 20 questions related to drug use within the last year. The problem severity was classified on a scale from 0 to 20 and was scored as follows: 0 =

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no problem; from 1 to 5 = mild; 6 to 10 = moderate; 11 to 15 = substantial; and 16 to 20 = severe. The severity scale has been used in several studies, and measures of reliability and validity have been reported to be satisfactory in all the versions for utilization as a clinical and/or research tools (Yudko, Lozhkina & Fouts, 2007). In the latter study, the Cronbach's alpha of DAST was 0.92, which indicates excellent internal consistency (Diehl, Silva, & Laranjeira, 2013).

The Fagerström Test for Nicotine Dependence (FTND). This test consists of six items. The scores obtained on the test permit the classification of nicotine dependence into five levels: very low (0-2 points); low (3-4 points); moderate (5 points); high (6-7 points); and very high (8-10 points). The reliability index is excellent (0.87), and Cronbach's alpha coefficient ranges from 0.55 to 0.74 (Meneses-Gaya et al., 2009).

A descriptive data analysis was initially performed. For the categorical variables, the absolute and relative frequencies are presented, and for the numerical variables, the frequency measurements (mean, minimum, maximum, and standard deviation) are presented. Statistical analyses include chi-square test or Student's t-test for independent samples and logistic regression. Due to the dichotomous nature of the dependent variable and to facilitate the interpretation of the results, Prevalence ratio (PR) was used (Poisson regression model with robust estimation for the standard error). A significance level of 5% was used for al statistical tests. The Statistical Package for Social Science (SPSS Inc., Chicago, USA), version 17.0 was used for the analysis of the data.

Results

Socio-demographic Data

The socio-demographic characteristics of both groups are displayed in Table 1. The sample (N = 299) was divided in two groups of subjects classified as, low sexually vulnerable (GR1) 181 (60.5%) and highly sexually vulnerable (GR2) 118 (39.5%). The total sample was characterized predominantly by adults, Caucasian, unmarried, and Catholic, unemployed, and earned a minimum wage of less than $330 dollars. However, there were associations between group of risk sexual behaviour and education level (p < 0.001), race (p < 0.001), religion (p < 0.001), occupational status (p = 0.007) and salary range (p < 0.001).

There has been a predominance of individual with secondary school 53.4%, white 51.7%, Evangelical 58.6%, non-registered employee/liberal profession 58.8%, income (2 a 3 MW) 56.6% more than 7 MW 68.2%, among the group of highly vulnerable sexual behaviour (GR2). In contrast, the group with low vulnerable sexual behaviour (GR1) showed the highest percentage of illiterate 95.4%, Catholic 71.6%, totally unemployed 66.5%, and earned approximately USD 330 at the time of the study 76.4%.

Characteristics of substance use

The characteristics of substance use of the 299 participants are shown in Table 2. In the total sample the DOC the most frequent were 56.2% crack, 18.7% alcohol, and 16.4% cocaine. There were no reports of previous or current use of injectable drugs in this sample, although this was not an exclusion criterion. The tests for the evaluation of severity of dependence indicated that 31.8% of subjects exhibited high/very high FTND scores, 25.1% scored severe on the SADD, and 49.2% scored substantial on the DAST.

Associations were identified between the groups of sexual risk behavior and all variables related to the use of psychoactive substances. As show in Table 2, heterogeneous distributions were observed in both groups. In the GR2, the findings showed a higher percentage in the use of snorted cocaine (DOC) (69.4%), poly-drug user (70%), tobacco - very low/low/moderate (FTND) (56.2%), mild dependence (66.7%), severe dependence of alcohol (58.7%) (SAAD), and substantial /severe dependence of drug (DAST) (64.6%).

In contrast, the group with low sexually vulnerable (GR1) presented higher percentages of individuals the use of crack (DOC) (72.6%), non-smoker (FTND) (81.7%), does not use alcohol (SAAD) and (74.8%) no problem/low/moderate (91.5%) (DAST). The findings also showed that there were no significant differences between the two groups (data not displayed in table) in relation to the average time of use of psychoactive substances (GR1 15±9.8 versus GR2 14.7±9.4, p = 0.793) and the number of previous treatment for drug addiction (GR1 2.7±4.1 versus GR2 2.8±2.7, p = 0.915).

Characteristics of sexual behavior

The characteristics of sexual behaviour of the sample are shown in Table 3. Fifth-seven percent had sexual activity in the past 12 months. The distribution of sexual orientation in the sample was (94%) heterosexual, (4%) homosexual, and (2%) of bisexual.

The average age in the total sample at the time of first intercourse was (mean 14.6; *SD* 3.4) years old, and in the comparison between the groups, (GR1 15.2±3.2, versus GR2 14.2±3.4), no statistically significant difference was identified. The average number of sexual partners in the past year was 2.9. However, there was significant statistical difference between the two groups (GR1 0.4±0.7 versus GR2 6.7±5.1; p < 0.001).

Accordingly, the average number of sexual encounters per week was (Mean 4.5; *SD 4.9*), and when comparing the groups (GR1 3.2±2.5 versus GR2 5.4±5.9) a significant statistical difference (p < 0.001) was observed.

However, there were association between high risk sexual behaviour (GR2) and sexual activity in the last 12 months (p < 0.001), homosexual experience (p < 0.001), homosexual experiences in exchange sex for drugs (p < 0.001), history of STIs (p < 0.001), HIV testing (p < 0.001), induced abortion (p < 0.001) and, sex with sex worker (p < 0.001).

Table 1
Socio-demographic Characteristics of Sexual Risk Groups (N = 299)

| | Total | | Sexual risk group | | | | p value |
| | | | Up to 2 sexual partners in the last year and always uses condoms (n = 181) GR1 | | Three or more sexual partner in the last year and uses condoms sporadically or never uses condoms (n = 118) GR2 | | |
	N	%	N	%	N	%	
Gender							
Male	260	87.0	155	59.6	105	40.4	0.401
Female	39	13.0	26	66.7	13	33.3	
Marital status							
Single	180	60.2	116	64.4	64	35.6	
Married/stable union	68	22.7	35	51.5	33	48.5	0.169
Widowed/Divorced/Separated	51	17.1	30	58.8	21	41.2	
Educational level							
Illiterate	65	21.7	62	95.4	3	4.6	
Elementary school	130	43.5	72	55.4	58	44.6	**<0.001**
Secondary school	88	29.4	41	46.6	47	53.4	
Higher education/graduate education	16	5.4	6	37.5	10	62.5	
Ethnicity/skin color/race							
Non-white	148	49.5	108	73.0	40	27.0	**<0.001**
White	151	50.5	73	48.3	78	51.7	
Religion							
Catholic	176	58.9	126	71.6	50	28.4	
Evangelical	58	19.4	24	41.4	34	58.6	**<0.001**
Spiritist/Umbanda/Candomblé/Other	38	12.7	18	47.4	20	52.6	
Firm atheist/without religion	27	9.0	13	48.1	14	51.9	
Occupational status							
Retired	2	0.7	1	50.0	1	50.0	
Registered employee	36	12.0	19	52.8	17	47.2	**0.007[a]**
Non-registered employee/liberal profession	51	17,1	21	41.2	30	58.8	
Fully unemployed	206	68.9	137	66.5	69	33.5	
Homemaker	4	1.3	3	75.0	1	25.0	
Salary range							
Up to 1 MW	144	48.2	110	76.4	34	23.6	
2 to 3 MW	76	25.4	33	43.4	43	56.6	**<0.001**
4 to 5 MW	41	13.7	22	53.7	19	46.3	
6 to 7 MW	16	5.4	9	56.3	7	43.8	
More than 7 MW	22	7.4	7	31.8	15	68.2	

[p] Descriptive level of the chi-squared test [a] Descriptive level of the Fisher's exact test.

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Table 2
Characteristics of substance use and dependence and Sexual risk groups (N = 299)

| | Total | | Sexual risk group | | | | p |
| | | | Up to 2 sexual partners in the last year and always uses condoms (n = 181) GR1 | | Three or more sexual partner in the last year and uses condoms sporadically or never uses condoms (n = 118) GR2 | | |
	N	%	N	%	N	%	
DOC							
Alcohol	56	18,7	31	55.4	25	44.6	
Marijuana	15	5.0	9	60.0	6	40.0	
Snorted cocaine	49	16.4	15	30.6	34	69.4	<0.001[a]
Crack	168	56.2	122	72.6	46	27.4	
Poly Drug user	10	3.3	3	30.0	7	70.0	
Oral Opiates	1	0.3	1	100	-	-	
FTND							
Very low /Low/Moderate	73	24.4	32	43.8	41	56.2	
High/very high	95	31.8	42	44.2	53	55.8	**<0.001**
Non smoker	131	43.8	107	81.7	24	18.3	
SAAD							
Mild dependence	27	9.0	9	33.3	18	66.7	
Moderate dependence	42	14.0	25	59.5	17	40.5	**<0.001**
Severe dependence	75	25.1	31	41.3	44	58.7	
Does not use alcohol	155	51.8	116	74.8	39	25.2	
DAST							
No problem/low /Moderate level	118	39.5	108	91.5	10	8.5	**<0.001**
Substantial /severe level	147	49.2	52	35.4	95	64.6	
Does not use drugs	34	11.4	21	61.8	13	38.2	

[p] Descriptive level of the chi-squared test (test statistics; degrees of freedom). [a] Descriptive level of the Fisher's exact test.
Note. DOC=Drug of Choice; FTND= The Fagerström Test for Nicotine Dependence; SADD= Short Alcohol Dependence Data; DAST= Drug Abuse Screening Test

There was a high percentage of individuals without sexual intercourse in the last 12 months (99.2%), without homosexual experience (66.9%), without homosexual experiences in exchange sex for drugs (64.8%), without history of STIs 67.8%, without HIV testing (81.1%), without induced abortion (67.8%), without sex with sex worker (81%), predominantly in the group with low vulnerable sexual behaviour (GR1).

It is the higher percentage of individuals with some homosexual experience (92.9 %), in the group that showed sexual behavior vulnerability (GR2).

Highly Vulnerable Sexual Behaviour

According to the Poisson regression model (Figure 1), the variables that remaining significant were DOC, SAAD, DAST, history of STIs, sex with sex workers and use of the morning–after pill. Thus, it was observed that the likelihood of users of alcohol and cocaine snorted, it have high-risk sexual behavior is 2.47 and 1.66 times to users of crack/opiate/poly-drug respectively.

In relation to scores of DAST, note that those who did not present any risk or low and moderate level presented probabilities of having high-risk sexual behavior similar to those of who do not use drugs. On the other hand, those who have substantial or severe level presented likelihood 3.64 times greater. It was also noted that those who have sex with sex workers (males only), which made use of the morning-after pill and have a history of Sexual Transmitted Infection (STI) presented probabilities respectively of (96 %), (78%) and (39%) higher than those belonging to the group of high risky sexual behavior.

Table 3
Characteristics of Sexual Behavior and Sexual Risk Groups (N = 299)

| | Total | | Sexual risk group | | | | p. value |
| | | | Up to 2 sexual partners in the last year and always uses condoms (n = 181) GR1 | | Three or more sexual partner in the last year and uses condoms sporadically or never uses condoms (n = 118) GR2 | | |
	N	%	N	%	N	%	
Sexual activity in the past 12 months							
Yes	172	57.5	55	32.0	117	68.0	**<0.001**
No	127	42.5	126	99.2	1	0.8	
Sexual orientation							
Heterosexual	281	94.0	170	60.5	111	39.5	
Homosexual	12	4.0	7	58.3	5	41.7	1.000[b]
Bisexual	6	2.0	4	66.7	2	33.3	
Homosexual experience							
Never	239	79.9	160	66.9	79	33.1	
At least once	14	4.7	1	7.1	13	92.9	**<0.001**
More than once	46	15.4	20	43.5	26	56.5	
Homosexual experience in exchange for drugs							
Yes	32	10.7	8	25.0	24	75.0	**<0.001**
No	267	89.3	173	64.8	94	35.2	
History of STIs							
Yes	66	22.1	23	34.8	43	65.2	**<0.001**
No	233	77.9	158	67.8	75	32.2	
HIV testing							
Yes	167	55,9	74	44.3	93	55.7	**<0.001**
No	132	44,1	107	81.1	25	18.9	
Use of the morning-after pill							
Yes	12	4.0	4	33.3	8	66.7	0.069[a]
No	287	96.0	177	61.7	110	38.3	
Induced abortion							
Yes	66	22.1	23	34.8	43	65.2	**<0.001**
No	233	77.9	158	67.8	75	32.2	
Sex with sex workers							
Yes	136	45.5	49	36.0	87	64.0	**<0.001**
No	163	54.5	132	81.0	31	19.0	

[p] Descriptive level of the chi-squared test (test statistics; degrees of freedom). [a] Descriptive level of the Fisher's exact test. [b]

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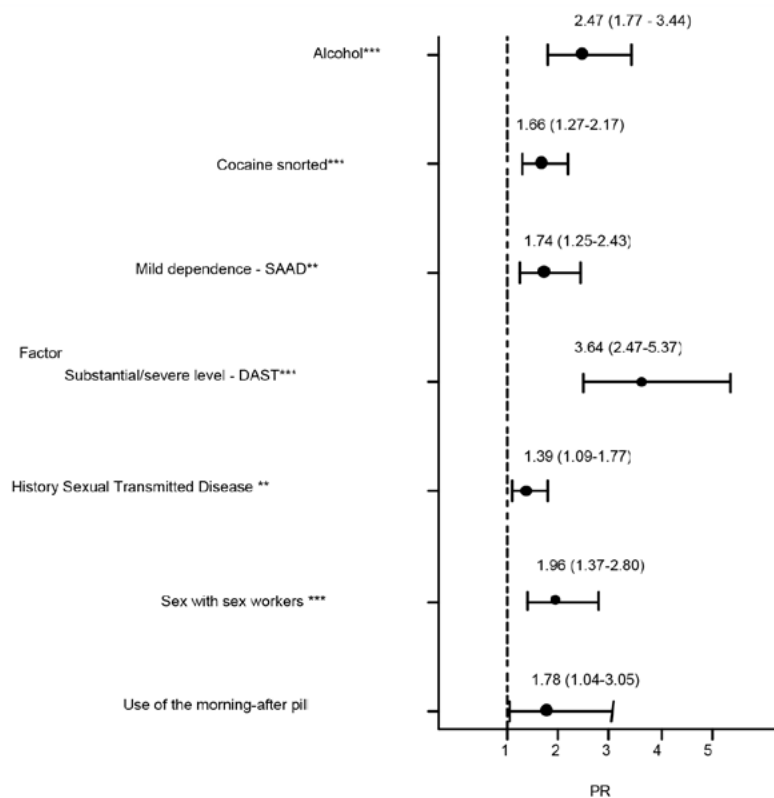
Figure 1. Factors associated to sexual risky behavior prevalence ratios and 95% Confidence Intervals obtained from a Poisson regression model with robust variance

Discussion

The purpose of this investigation was to evaluate high-risk sexual behaviors in a sample of substance-disorder patients admitted in an inpatient addiction unit. Socio-demographics characteristics of this sample are peculiar according to different levels of sexual risk behaviors. Evidence suggests that drug addicts are characterised in particular by a complex population because of the diversity of sexual risk behaviors that those users engage (social context, sexual orientation, and type of sexual interaction) (Celentano, Latimore, & Mehta, 2008).

Thirty-nine percent the subjects of the high risk sexual behavior group also exhibited a higher prevalence of risky behaviors including having sex with sex workers, homosexual experiences and homosexual experiences in exchange for drugs, history of STIs, HIV testing, use of the morning–after pill, induced abortion. These findings are similar to those presented in the literature (Harzke, Williams, & Bowen, 2009; Pallonen, Timpson, Williams, & Ross, 2009). Evidences show that high level of dependence on alcohol and illegal drugs increased the probability of belonging to the group with the highest sexual risk, independent of gender (Celentano et al., 2008; Dickson-Gomez et al., 2012; Mitchell et al., 2009).

The finding of the present study also indicated that this sample exhibited high rates of vulnerable sexual behavior:

non-use or inconsistent use of condoms; a high number of sexual partners over the course of a year, earlier onset of sexual activity; and multiple sexual encounters per week. Furthermore, other sexual behavior traits, such as homosexual experiences in exchange for drugs, earlier onset of sexual activity, and a larger number of sexual partners, were more frequent. Individual characteristics and treatment approaches can differentially affect outcomes (for example: safe sex, less use of drugs, reduces sex under the influence of drugs), and these differences have important clinical and treatment implications (Tuchman, 2012).

Many studies have identified high levels of sexual risk behaviors among crack users (Atkinson et al., 2010; de Souza et al., 2002; Dickson-Gomez et al., 2012), including sex with multiple partners, inconsistent or non-use of condoms, and high rates of exchanging sex for drugs (Dickson-Gomez et al., 2012; Pallonen et al., 2009; Schönnesson et al., 2008). In our sample, however, the high sexual risk group was observed in individual who snorted cocaine and the use of opiate and alcohol as their DOC. One reason for the difference may be that, although crack was statistically the most frequent DOC, this variable was associated with high-risk behavior group. (GR2). In addition, most individuals reported crack as their drug of choice

Data on frequency and patterns of psychoactive drug use were not collected in this study, since the authors were interes-

ted in assessing the associations with the DOC. However, the absence of this information may be considered one of limitations of this study since frequency and pattern of consumption tend to be less subjective measures that DOC. The increase in sexual behavior while intoxicated with snorted cocaine may be due to the direct pharmacological effects of the drug, which increase sexual desire. Alternatively, especially among long-term cocaine users, it may be due to the increased opportunities for sex that exist in the context of cocaine use (For example, opportunities for sexual behavior, expectations about the effects of the drug, social norms) (Kopetz et al., 2010; Wright, 2012). One of the damaging effects of cocaine use is compromised judgment capacity, which leads to hazardous sexual behaviors and increases the chances of contracting HIV (Dunn & Laranjeira, 1999; Kumar, 2011). Crack also has deleterious effects on perceived sexual desire and erectile function, though sexual behavior in crack users seems to be more frequently linked to "sex for crack" exchanges than sexual desire per se (Nappo et al., 2011).

Previous research has also linked alcohol dependence with an increased number of sexual partners, inconsistent condom use, and an increased incidence of STIs (Berbesí-Fernández, Montoya-Vélez, & Segura-Cardona, 2013; Espada, Morales, Orgilés, Piqueras, & Carballo, 2013). The effects of alcohol on the appraisal of sexual potential differed by partner risk condition. Some results have suggested that wives of alcoholic men are unknowingly placed at risk for indirect exposure to STIs as a result of their husbands' sexual risk behaviors (Hall, Fals-Stewart, & Fincham, 2008; Osborne & Cottler, 2012; Varma, Chandra, Callahan, Reich, & Cottler, 2010).

Interestingly, the present study found an association between FTND scores and the sexually vulnerable groups. As a rule, studies tend to focus on the relationship between smoking and sexual dysfunction, while the association of the former with high-risk sexual behavior has scarcely been addressed (Diehl et al., 2013; Zaazaa, Bella, & Shamloul, 2013). That scarcity notwithstanding, there are reports in the literature on the correlation between the exposure of oral mucosa to tobacco, which causes abrasions and makes it susceptible to human papilloma virus (HPV), and impaired reproductive health (Kazemi et al., 2013; Zil-A-Rubab et al., 2013). Furthermore, many studies have reported tobacco use by adolescents and young adults as a predictor of early sexual intercourse, unwanted pregnancy, infrequent condom use, receiving money for sexual services, and lifetime risk of contracting an STI (Hanna, Yi, Dufour, & Whitmore, 2001; Wu, Witkiewitz, McMahon, Dodge, & Conduct Problems Prevention Research Group, 2010).

This study was limited by its recruitment, which took place at only one tertiary service. Therefore, this convenience sample of patients may not be representative of the population of substance abusers because it is expected that only the most serious or highly motivated patients seek treatment.

In this sample, there were no injecting drug users, which is not surprising for a Brazilian population of drug abusers because this country does not have a prevalent "injecting culture". This trend has been especially prevalent since crack became available in the 1990s, which corresponded to the period during which the present sample initiated drug abuse (Dias et al., 2011). In addition, opioids, which are also known to be mainly used intravenously, are more expensive and less available in Brazil. Consequently, these factors may limit the external validity of these findings.

Nevertheless, the present sample could be considered similar to others that have been previously studied in the clinical setting in Brazil with respect to the prevalence of various drugs of choice and the sample profile. Among the illicit drugs, treatment demand for crack abuse has perhaps increased the most in recent years. Crack addiction is the most frequent cause of cocaine-related hospitalization. A national review study indicated that the profile of crack users included young, unemployed, unschooled, and poor individuals from broken families with many sexual vulnerability behaviors (Duailibi et al., 2008). This review study also demonstrated that the most frequent risk behaviors associated with crack/cocaine users are a high number of partners, unprotected sex, and trading sex for crack or for money to purchase the drug of choice (Duailibi et al., 2008).

Another limitation is that we did not investigate sex under the influence of substances; doing so is difficult, partly due to the ethical issues, the research methods used and also to the complexity of studying these dynamic associations. It is unknown whether hazardous sex is antecedent to or a result of drug use or if both behaviors are concurrently associated with other factors. In addition, the presence of psychiatric comorbidities (in either axis I or II) associated with substance dependence was not investigated by means of standardized instruments, for example, the Composite International Diagnostic Interview (CIDI) (Kessler et al., 1998). Although countless studies have indicated that the presence of psychiatric comorbidities in drug users is associated with a higher frequency of high-risk sexual behaviors (Meade & Sikkema, 2005; Newville & Haller, 2012). Even though investigating the presence of psychiatric comorbidities would have increased the relevance of the results of the present study, we decided not to include such efforts in the study protocol for practical reasons. We acknowledge that the selection of the DAST might represent another limitation in the present study. However, it is worth emphasizing that the Cronbach's alpha of this tool was 0.92 in a previous study conducted by our group (Diehl et al., 2013), which indicates excellent internal consistency. Additionally, in the present study, none of the scales data were represented as continuous variables. Instead, all of the scale data were represented as categorical variables only, which hindered any analysis of the internal consistency of the scales used. Finally, we recognize that issues related to HIV infection may strongly condition the sexual risk behavior in the study population. However, current informa-

tion on HIV status sample are not included. This can be considered another limitation of this study.

The clinical implication is that substance abuse is one of the strongest predictors of sexual risk behavior. Thus, treating substance abuse should focus on harm-reduction in reducing sexual risk behaviors. As such, the focus should be on identifying individuals for medical and/or behavioral treatments for substance abuse to reduce or eliminate substance-related sexual transmission behaviors in combination with HIV-prevention strategies in substance users to reduce sexual risk behaviors and related outcomes (e.g., HIV, STI) (Shoptaw et al., 2013). In addition, sexual health should be a part of the recovery process and should not be subject to discrimination. Because sexual health and its correlates, including responsibility, self-efficacy, the intentional use of condoms, and condom-use behaviors, are not directly addressed in alcohol and drug treatment centers, poor sexual health may contribute to treatment failure, leading to relapse and the consequent substantial risk of HIV exposure, STIs, and unplanned pregnancies. This relationship occurs because drugs affect the ability to make assertive decisions relative to the use of condoms, and casual sexual encounters may be related to increased opportunities for drug abuse (Harvey, 2009; Williams et al., 2008; Zule, Costenbader, Coomes, & Wechsberg, 2009).

Brief group interventions, such as positive choice interventions, educational interventions, and motivational interventions, have been found to increase condom use and the intention to use condoms and also to alter condom-use attitudes and beliefs in substance-related disorder patients (Harvey,2009). Some evidence for sexual risk reduction interventions for alcohol and drug addiction patients suggests that substance-dependent patients are diverse in terms of HIV status and substance of choice; as a result, interventions that can be tailored to meet the recipients' individual needs with respect to gender and sexual orientation are required. It is also important that such interventions be deliverable in a variety of venues and by different staff members (For example: social workers, counselors, nurses, outreach workers) who may not possess advanced clinical or psychological training (Harvey, 2009; Wright, 2012).

Although the literature is quite informative with respect to risk behaviors and infection rates for different blood-borne and sexually transmitted infections, this knowledge alone does not seem to be sufficient to change sexual behavior (Williams et al., 2008). Many patients come to treatment with feelings of guilt and shame related to their sexual behavior prior to recovery; if these feelings are not resolved, they can be a factor in relapse and non-compliance rates. Therefore, identifying, preventing, and managing these issues in alcohol and other drugs users are an excellent opportunity to bolster their treatment (Kopetz et al., 2010; Williams et al., 2008). Although this subject has been addressed as an overlying

topic, this study had several strengths once that included a large clinical sample of Brazilians with substance use disorders, one group of the population that is particularly underrepresented in the body of literature.

One of the possible implications of the present study concerns attempts to improve our understanding of high-risk sexual behaviors in drug users who are not undergoing treatment by accessing the use of other methods, such as community-based outreach methods, including establishing contacts with the local leadership in areas of poverty or areas that are difficult to access, e.g., as a function of their high risk of violence (Schwartz, Kelly, O'Grady, Mitchell, & Brown, 2011). These topics should be addressed in future research according to the number of drug users who seek treatment is still low, and many of users are marginalized as a result of untreated sexually transmitted diseases, such as hepatitis B and C, for which they seldom seek healthcare services (Malta et al., 2011).

The present sample exhibited traits related to the level of dependence, drug of choice and sexual behaviors that increased prevalence ratios of high-risk sexual behaviors.

Conflict of interest

None.

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