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ORIGINAL ARTICLE

Sexual compulsivity, anxiety, depression, and sexual risk behavior among treatment-seeking men in São Paulo, Brazil

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Objective: There is a lack of studies on negative mood states and sexual risk behavior in men of all sexual orientations who seek treatment for excessive sexual behavior (ESB). We aim to examine sexual compulsivity (SC), anxiety, depression, and sexual risk behavior in a treatment-seeking sample of men and controls.
Methods: We enrolled 88 (37 [42%] gay or bisexual and 51 [58%] heterosexual) ESB outpatients and 64 controls. Assessments included the Sexual Compulsivity Scale (SCS), the Beck Anxiety Inventory (BAI), the Beck Depression Inventory (BDI), and sexual risk behaviors.
Results: Compared to controls, ESB outpatients showed increased SC, anxiety, and depression, which were correlated. Regarding sex with casual partners, ESB outpatients reported more sexual intercourse, a greater number of partners, more anal intercourse, and unprotected anal intercourse. Anxiety, depression, and SC were associated with protected vaginal intercourse with a main partner, whereas they were associated with unprotected anal intercourse with a casual partner. Depression was associated with unprotected vaginal intercourse with a casual partner. Condomless anal intercourse was predicted by SC and was also reported by the heterosexual ESB outpatients (36%).
Conclusion: The data contribute to the field by providing information on men of all sexual orientations who are searching for mental healthcare. The connections among these psychopathological factors and sexual risk behavior have implications for public health, clinicians, and research.

Keywords: Sexual compulsivity; affect; anxiety; depression; HIV; sexual risk behavior

Introduction

Since 2013, when the proposed diagnostic criteria for hypersexual disorder were not included in the DSM-5,[1] an increasing number of studies have aimed to better investigate individuals who seek treatment for excessive sexual behaviors (ESB) in an attempt to overcome the controversial issues surrounding the explanatory models of ESB. Studies indicate that the main alteration in individuals with ESB is impulsivity,[2,3] which supports the diagnostic criteria of excessive sexual drive in the ICD-10.[2,4] Other studies have noted that the main psychopathological changes include developing a compulsion to deal with anxiety, similar to the obsessive-compulsive disorder (OCD) mechanism,[5,6] which favors the current proposed diagnostic criteria for it in the ICD-11 as a compulsive sexual behavior disorder.[7] Some data support the idea of ESB functioning similarly to addiction,[8] which involves both impulsivity and compulsivity influences, favoring the diagnostic criteria for sexual addiction.[9] The new hypersexual disorder criteria were conceptualized based on animal studies in which the interaction of alterations of brain monoamine metabolism and testosterone receptors resulted in a hyperactivation of sexual desire,[10] which is supported by new studies.[11] Despite the differences, all theories of ESB note that, beyond presenting excessive and repetitive sexual thoughts, urges, and behaviors within a specific time frame, these individuals are reporting distress due to the symptoms and experiencing negative outcomes in the main areas of life, such as work, health, and relationships.

Due to its impulsivity and loss-of-control aspects,[12] ESB has been identified as predictive of risky sexual behavior in a variety of populations in the United States, particularly among gay and bisexual men.[13,14] Specifically, these studies have identified connections between sexual compulsivity (SC) and numerous negative sexual outcomes, such as condomless anal sex with multiple casual partners, a higher incidence of human immunodeficiency virus (HIV) and other sexually transmitted infections (STIs),[15,16] and intentionally seeking out condomless anal sex.[17] However, these studies have assessed SC symptoms in broad populations of individuals instead of treatment-seeking samples.

For some individuals with ESB, their sexual behavior does not involve sexual partners, but rather is focused on

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excessive masturbation and/or use of pornography. However, typically more than half of those with ESB report problems involving compulsive sex with casual partners[18] and in one study of gay and bisexual men with SC, 92% reported that sex with casual partners was out of their control.[19] Individuals with ESB who engage in multiple casual sexual encounters with consenting adults run the highest risk for the most severe medical morbidity and mortality associated with ESB, which is the transmission of STIs, including HIV.[17,20,21] Research in the United States has shown that higher scores on a commonly used measure of ESB, the Sexual Compulsivity Scale (SCS), predict sex with more casual partners, greater risk-taking behavior (e.g., low condom use and increased anal sex), and acquisition of STIs.[3,22] Unfortunately, data is scarce on the connections between ESB and sexual risk behavior in straight men.[13,23] The little extant data has not involved treatment-seeking samples of individuals with ESB and has presented very limited descriptions.

Negative mood states, particularly anxious and depressive moods, have been associated with ESB.[24] Behaviors such as encounters with multiple casual sex partners and increased masturbation have been reported in men suffering from these negative mood states.[25] Such negative state moods are thought to serve as triggers for ESB[26] and may facilitate more episodes of condomless sex, increasing the risk of contracting HIV and STIs. However, other researchers have found that only a minority (15-25%) of individuals report increased sexual behavior when experiencing anxiety or depression.[27]

Some data suggest that experiencing anxiety, depression, or anger may impact sexual decision making in negative ways.[28] Conversely, other studies have found that some people experiencing negative mood states may make decisions to avert risk.[29] Regarding sexual risk taking, these data would suggest that individuals experiencing depression or anxiety would be less likely to engage in sexual risk behavior. However, Mustanski[28] found that increases in anxiety were related to more sexual risk taking in some gay and bisexual men and hypothesized that the arousal components of anxiety may be linked to feelings of excitement that might potentiate risky behavior.

While a relevant body of studies on ESB has been conducted in the United States, empirical data about ESB in Brazil and other parts of the world are very limited, compromising the generalization of knowledge, since sexual behavior is related to cultural variations. There is a particular scarcity of studies about the impact of ESB and negative mood on HIV risk behavior in treatment-seeking samples.

The goal of the present study was to examine ESB, anxiety, depression, and sexual risk behavior among ESB outpatients and controls in the capital of the state of São Paulo, Brazil. Based on evidence from the United States, we hypothesized that individuals with ESB would present an increased severity of anxiety and depression and report more sexual risk behaviors than controls. We also hypothesized that the severity of anxiety, depression, and ESB would be positively associated with sexual risk behavior.

Method

Participants and procedures

This paper presents data from a study conducted at the Ambulatório de Impulso Sexual Excessivo e Prevenção de Desfechos Negativos Associados ao Comportamento Sexual (AISEP), Instituto de Psiquiatria (IPq), Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo (USP). Participants were recruited through advertisements in the institution and the nearby community via several media outlets, such as radio, magazines, and journals. The first wave of recruitment targeted participants with ESB symptoms, and those who sought treatment for ESB were eligible for the study if they were classified as having an excessive sexual drive based on ICD-10 criterion F52.7, which means that they complain of an excessive sexual drive that often leads to ESB,[4] and a sex addiction based on Goodman's criteria, which means that there is a maladaptive ESB leading to clinical impairment or distress manifested in the same 12-month period by three or more of the following: tolerance (escalating sexual behavior); withdrawal (physical and/or psychological symptoms, such as experiencing abstinence); frequent sexual behavior; unsuccessful control; wasting time in preparation for sexual activity; reduced social or occupational activities; and continuance despite negative outcomes.[9] A second wave of recruitment targeted participants without ESB symptoms. Individuals who sought participation as controls were eligible if they did not meet criteria for excessive sexual drive based on the ICD-10 criterion F52.7 or for a sex addiction based on Goodman's criteria. In addition, participants had to be 18 years of age or older, literate, and had to have lived in Brazil for the last 10 years. Exclusion criteria for the study included a diagnosis of any of the following disorders: paraphilias (ICD-10 F65), gender identity disorder (ICD-10 F64), schizophrenia, schizotypal and delusional disorders (ICD-10 F20-F29), current manic or hypomanic episode (F 30.0, F31.0, and F 31.1, F 31.2), and other mental disorders due to brain dysfunction or injury or physical disease (ICD-10 F0.6).

A total of 204 individuals responded to the study advertisements during the first wave and 130 came for the screening interview. Of these, 114 men and 10 women were considered eligible and were enrolled in the study, but 26 men did not complete all of the assessments for a variety of reasons, including moving to another city, searching for treatment for a different comorbid condition, or difficulty understanding the self-response measures. A total of 121 individuals sought to participate as controls and 78 came for the screened interview. However, five of these met the criteria for excessive sexual drive and sexual addiction and were excluded from the control sample. The remaining 73 candidates, 64 men and nine women, were considered eligible as controls and were enrolled in the study. In this paper, we report data from the 88 males who fulfilled the criteria for excessive sexual drive and sexual addiction, whom we will call ESB outpatients, and 64 males who did not fulfill the criteria for excessive sexual drive and sexual addiction, whom we will call controls. All of the

study assessments were completed from October 2010 to November 2011.

All participants provided informed consent and completed a one-time 2-hour assessment that consisted of standardized self-response measures and a psychiatric assessment. Participants completed the measures on their own using a paper and pencil version. Research assistants provided an overview of the self-report measures and gathered sociodemographic data. A psychiatrist conducted the clinical interview to investigate eligibility criteria. Controls received financial support for transportation. Treatment was offered to those with ESB. This study was reviewed and approved by the ethics committee of the Hospital das Clínicas, Faculdade de Medicina, USP.

Measures

Participants were asked to report their age, gender, legal marital status, race, years of education, employment, family monthly income, sexual orientation, and HIV serological status.

Excessive sexual behavior (ESB) measure

The SCS was developed to evaluate trends of recurring sexual cognitions and compulsivity.[30] The scale consists of 10 statements (e.g., "My sexual thoughts and behaviors are causing problems in my life.") that are rated on a four-point scale from 1 = not at all like me, to 4 = very much like me. It is a widely used measure of ESB. The Brazilian version has been shown to have good reliability (Cronbach's alpha of 0.95).[31]

Psychopathology measures

The Portuguese version of the Beck Anxiety Inventory (BAI) was validated for use in Brazil[32] and has been found to be reliable (Cronbach's alpha = 0.76). This is a 21-item self-reported scale designed to measure the severity of symptoms of anxiety with the following four-point response scale: 0 = absolutely not, 1 = slight, 2 = moderately, and 3 = severely. The Portuguese version of the Beck Depression Inventory (BDI) was validated for use in Brazil (Cronbach's alpha = 0.81)[33] This is a 21-item self-reported scale designed to measure the severity of depressive symptoms, such as mild, moderate, and severe.

Sexual risk behavior

A Sexual Behavior Risk Assessment was developed by the first author of this paper based on previous research[34,35] to collect information on sexual behavior with main and casual partners, including the monthly frequency of anal and vaginal intercourse, condom use, and number of casual partners. The Sexual Behavior Risk Assessment was designed as a self-report questionnaire to assess sexual risk behavior in the prior six months This questionnaire was piloted with 20 individuals to check semantic and content issues and had a Cronbach's alpha of 83.35%. It also included complementary items about engaging in sex under the influence of alcohol and drugs.

Statistical analysis

Statistical analyses were performed using STATA version 10 with a significance level of $p < 0.05$. Descriptive statistics are presented as proportions for categorical variables and means and standard deviations for continuous variables. Group comparisons were made using chi-square tests or odds ratios and 95% confidence interval (95%CI) for categorical variables, and *t*-tests for continuous variables.

To test our first hypothesis that ESB outpatients would report increased severity of anxiety and depression and more sexual risk behaviors than controls, we examined differences in participant characteristics, anxiety, depression and SC scores, and sexual behavior between ESB outpatients and controls. To test our second hypothesis that the severity of anxiety, depression, and SC would be positively associated with sexual risk behavior, we performed a bivariate statistical analysis and then logistic regression models in order to examine the relative contributions of negative mood states (anxiety, depression) and SC on sexual risk behavior, namely: 1) condomless anal intercourse with a main partner; 2) condomless vaginal intercourse with a main partner; 3) condomless anal intercourse with a casual partner; and 4) condomless vaginal intercourse with a casual partner. All the models were adjusted for age, race, legal marital status, sexual orientation, and serological status.

Results

Participant characteristics are presented in Table 1. ESB outpatients were significantly older than controls ($t_{(150)} = 2.53$; $p = 0.006$). The age of the ESB outpatients ranged between 21 and 66 years old and the age of the controls ranged between 18 and 59 years old. More ESB outpatients than controls were Caucasian ($\chi^2_{(2)} = 8.20$; $p = 0.01$). Regarding sexual identity, more ESB outpatients reported being gay or bisexual than controls ($\chi^2_{(1)} = 12.10$; $p = 0.001$) and more ESB outpatients were employed ($\chi^2_{(2)} = 16.66$; $p < 0.001$). There was a marginal difference in marital status between ESB outpatients and controls, with ESB outpatients more likely to be married ($\chi^2_{(2)} = 4.64$; $p < 0.09$).

ESB outpatients had higher SC ($t_{(150)} = 19.30$; $p < 0.001$), anxiety ($t_{(150)} = 4.51$; $p < 0.001$), and depression scores ($t_{(149)} = 8.88$; $p < 0.001$) than controls. We found significant correlations between SC and depression (ESB outpatients: $r = 0.38$; $p < 0.001$; controls: $r = 0.25$; $p = 0.04$), SC and anxiety (ESB outpatients: $r = 0.27$; $p = 0.01$; controls: $r = 0.33$; $p = 0.007$), and depression and anxiety (ESB outpatients: $r = 0.66$; $p < 0.001$; controls: $r = 0.70$; $p < 0.001$).

Comparisons between ESB outpatients and controls for sexual behavior in the prior six months are presented in Table 2. ESB outpatients had higher odds of engaging in sex under the influence of drugs than controls. The control group reported more sexual behavior with main partners, more vaginal intercourse with main partners, and more unprotected vaginal intercourse with main partners. ESB outpatients reported more sexual intercourse with casual

Table 1 Sociodemographic data of 88 male ESB outpatients and 64 male controls in São Paulo, Brazil

	ESB outpatients (n=88)	Controls (n=64)	Total (n=152)	χ^2/t test statistic
Race				
Caucasian	70 (79.5)	38 (59.4)	108 (71.1)	
African descendants	16 (18.2)	25 (39.1)	41 (27.0)	
Other	2 (2.3)	1 (1.6)	3 (2.0)	8.20*
Legal marital status				
Married	38 (43.2)	17 (26.6)	55 (36.2)	
Single	42 (47.7)	41 (64.1)	83 (54.6)	
Divorced	9 (9.1)	6 (9.4)	15 (9.87)	4.64†
Sexual orientation				
Gay and bisexual	37 (42.1)	10 (15.0)	47 (30.9)	
Heterosexual	51 (58.0)	54 (84.4)	105 (69.1)	12.10‡
Employment status				
Unemployed	14 (15.9)	1 (1.6)	15 (9.9)	
Employed	69 (78.4)	48 (75.0)	117 (77.0)	
Student	5 (5.7)	15 (23.4)	20 (13.2)	16.66‡
Serological status reported				
Unknown	15(17.0)	13(20.3)	28 (18.4)	
Negative	64(72.7)	48(75.0)	112 (73.7)	
Positive	9(10.2)	3(4.7)	12 (7.9)	0.43
Age, mean (SD)	38.17 (8.91)	33.98 (11.41)	36.40 (10.21)	2.53*
Years of education, mean (SD)	14.20 (4.18)	13.47 (4.02)	13.89 (4.12)	1.09
Monthly income (R$), median (95%CI)§	3,000 (2,500-3,942)	3,000 (2,700-4,000)	3,000 (3,000-3,800)	0.90
Sexual compulsivity, mean (SD)	31.93 (5.02)	15.44 (5.44)	24.99 (9.67)	19.30‡
Anxiety, mean (SD)	13.43 (9.98)	6.48 (8.42)	10.51 (9.94)	4.52‡
Depression, mean (SD)	16.51 (8.60)	6.21 (5.66)	12.18 (9.06)	8.88‡

Data presented as n (%), unless otherwise specified.
95%CI = 95% confidence interval; ESB = excessive sexual behavior; SD = standard deviation.
* $p < 0.05$; † $p < 0.10$; ‡ $p < 0.001$.
§ Mann Whitney *U* test.

partners and a greater number of casual partners. The ESB outpatients reported much more anal intercourse with casual partners and unprotected anal intercourse with them. Of those who reported condomless anal intercourse with casual partners (n=28), 18 (64%) self-identified as gay or bisexual, while 10 (36%) self-identified as straight. Table 3 shows the distribution of sexual behavior of ESB outpatients according to sexual orientation. Regarding sexual relationships with main partners, those who self-identified as heterosexual reported more sexual intercourse, vaginal intercourse, and unprotected vaginal intercourse. Regarding sexual relationships with casual partners, those who self-identified as heterosexual reported more vaginal intercourse and unprotected vaginal intercourse, while those who self-identified as gay or bisexual presented a higher mean number of casual partners and reported more anal intercourse.

Figure 1 shows a different scoring pattern for psychopathological variables and sexual relationships with main and casual partners. Those reporting infrequent use of condoms with main partners presented lower psychopathological scores than those reporting frequent use of condoms. Conversely, those reporting infrequent use of condoms with casual partners presented higher psychopathological scores than those reporting frequent use of condoms.

The logistic regression models of sexual risk behaviors are presented in Table 4. SC was shown to be an independent predictor of unprotected anal intercourse with casual partners after controlling for age, race, legal marital status, sexual orientation, and serological status. Each one-point increase in SC increased the odds of condomless anal intercourse with casual partners by 7%.

Discussion

Two types of sexual risk behaviors can be distinguished. First, regarding sex with the main partner, controls reported higher frequencies of vaginal intercourse, most of which was unprotected intercourse. This was probably because there are more straight men in the control sample, who engage in sex with their partner without condoms, which is common in the context of long-term stable relationships. Second, regarding sex with casual partners, the ESB outpatients reported more casual partners, higher frequencies of sexual intercourse with casual partners, higher frequencies of anal intercourse, and higher frequencies of condomless anal intercourse than controls. This combination is worrying due to the risk of STIs and HIV transmission. A meta-analysis reviewed the role of anal intercourse in HIV transmission and concluded that anal intercourse is a high-risk practice for HIV transmission even during highly active antiretroviral therapy.[36] Moreover, they found an increasing proportion of heterosexuals engaging in anal intercourse with low rates of condom use,[36] which is consistent with our data, in which 36% of

Table 2 Sexual behavior of 88 ESB outpatients and 64 controls, São Paulo, Brazil

	ESB outpatients (n=88)	Controls (n=64)	OR	95%CI	p-value
Sexual intercourse in the last six months	74 (84.1)	50 (78.1)	1.48	0.65-3.37	0.350
Sexual intercourse with a main partner in the last six months	39 (44.3)	43 (67.2)	0.39	0.20-0.76	0.006
Vaginal intercourse with a main partner	32 (36.4)	39 (60.9)	0.37	0.19-0.71	0.003
Infrequent use of condoms during vaginal intercourse with main partners	26 (29.6)	29 (45.3)	0.51	0.26-0.99	0.047
Anal intercourse with a main partner	21 (23.9)	17 (26.6)	0.87	0.41-1.82	0.710
Infrequent use of condoms during anal intercourse with main partners	14 (15.9)	10 (15.6)	1.02	0.42-2.47	0.960
Sex with a casual partner in the last six months	62 (70.5)	22 (34.4)	4.55	2.28-9.07	< 0.001
Number of casual sex partners in the last six months, mean (SD)	12.63 (27.98)	0.86 (1.76)	t(150) = -3.36		0.001
0	26 (29.6)	42 (65.6)	1		
1	10 (11.4)	12 (18.8)	1.35	0.51-3.56	0.550
2 or more	52 (59.1)	10 (15.6)	8.4	3.64-19.36	< 0.001
Vaginal intercourse with a casual partner	35 (39.8)	18 (28.1)	1.69	0.84-3.37	0.140
Infrequent use of condoms during vaginal intercourse with casual partners	23 (26.1)	12 (18.8)	0.62	0.70-3.37	0.290
Anal intercourse with a casual partner	46 (52.3)	17 (26.6)	3.03	1.51-6.07	0.020
Infrequent use of condoms during anal intercourse with casual partners	28 (31.8)	9 (14.1)	2.85	1.24-6.58	0.010
Sex under the influence of alcohol					
No	55 (63.2)	38 (59.4)	1		
Sometimes	29 (32.9)	25 (39.1)	0.76	0.39-1.50	0.440
Often	4 (4.6)	1 (1.6)	1.14	0.58-2.21	0.700
Sex under the influence of drugs					
No	74 (84.1)	63 (98.4)	1		
Sometimes	11 (12.8)	1 (1.6)	9.00	1.07-75.27	0.010
Often	3 (3.5)	0	-		

Data presented as n (%), unless otherwise specified.
95%CI = 95% confidence interval; ESB = excessive sexual behavior; OR = odds ratio.
Infrequent condom use means using condoms in 0-75% of occasions.

Table 3 Sexual behavior of 37 gay/bisexual and 51 heterosexual ESB outpatients, São Paulo, Brazil

	Gay/bisexual	Heterosexual	p-value
Sexual intercourse in the last six months	31 (83.8)	43 (84.3)	0.950
Sexual intercourse with a main partner in the last six months	8 (21.6)	31 (60.8)	< 0.001
Vaginal intercourse with a main partner	2 (5.4)	30 (58.8)	< 0.001
Infrequent condom use during vaginal intercourse with main partners	1 (2.7)	25 (49)	< 0.001
Anal intercourse with a main partner	8 (21.6)	13 (25.5)	0.670
Infrequent condom use during anal intercourse with main partners	6 (16.2)	8 (15.7)	0.950
Sex with a casual partner in the last six months	31 (83.8)	31 (60.8)	0.020
Number of casual sex partners in the last six months, mean (SD)	23.8 (39.5)	4.5 (8.9)	0.006
Vaginal intercourse with a casual partner	6 (16.2)	29 (56.9)	< 0.001
Infrequent condom use during vaginal intercourse with casual partners	4 (10.8)	19 (37.6)	0.007
Anal intercourse with a casual partner	29 (78.4)	17 (33.3)	< 0.001
Infrequent condom use during anal intercourse with casual partners	18 (48.7)	10 (19.6)	0.004

Data presented as n (%), unless otherwise specified.
ESB = excessive sexual behavior.
Infrequent condom use means using condoms in 0-75% of occasions.

ESB participants who reported condomless anal intercourse with casual partners were straight men. When focusing on the sexual behavior of ESB outpatients, we also observed a relevant proportion of heterosexual men engaging in anal intercourse and in condomless anal intercourse with main partners.

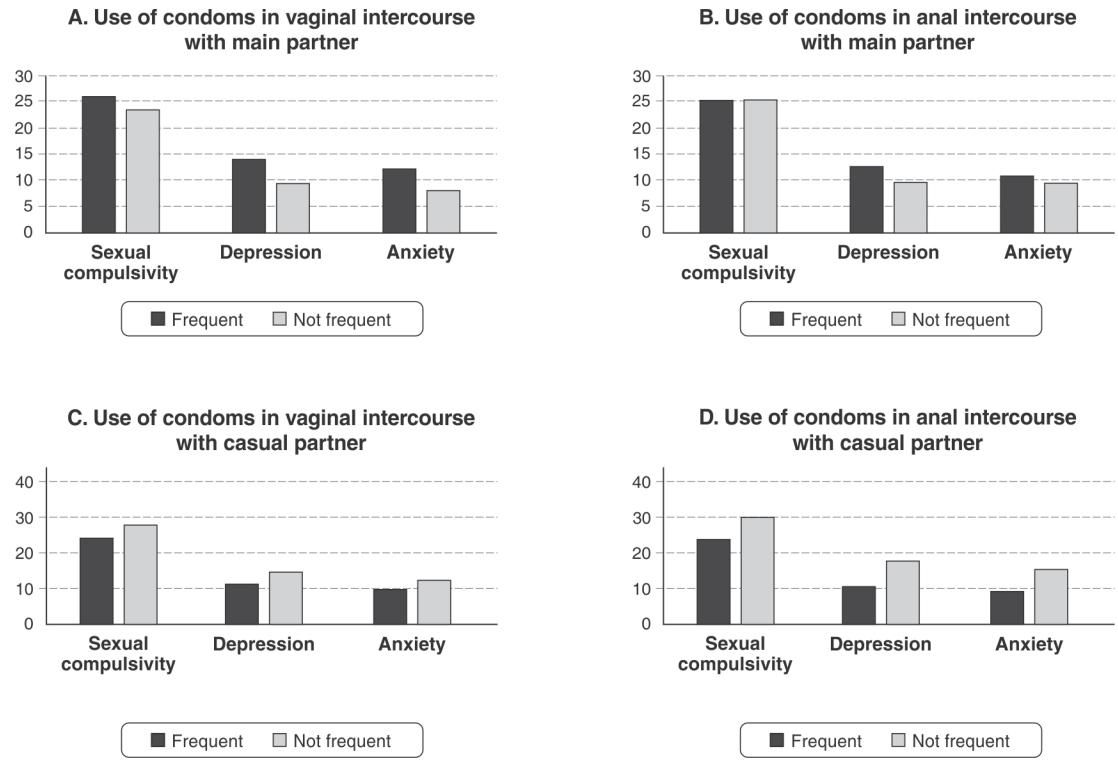

Figure 1 Use of condoms with main and casual partners among excessive sexual behavior (ESB) outpatients and controls (n=152). A: condom use in vaginal intercourse with main partner. Those reporting infrequent use of condoms presented with decreased depression (mean [M] = 9.3; standard deviation [SD] = 7.5 vs. 13.8; SD = 9.5) ($t_{[134.5]} = 3.2$; p = 0.001) and anxiety scores (M = 8.0; SD = 9.3 vs. M = 11.9; SD = 10.0) ($t_{[150]} = 2.4$; p = 0.02); B: condom use in anal intercourse with main partner; C: condom use in vaginal intercourse with casual partner. Those reporting infrequent condom use presented increased depression scores (M = 14.8; SD = 9.0 vs. 11.4; SD = 9.0) ($t_{[150]} = -2.0$; p = 0.05); D: condom use in anal intercourse with casual partner. Those reporting infrequent condom use presented increased sexual compulsivity (SC) (M = 29.8; SD = 9.8 vs. 23.5; SD = 9.5) ($t_{[150]} = -3.6$; $p < 0.001$), depression (M = 17.6; SD = 8.9 vs. M = 10.4; SD = 8.4) ($t_{[150]} = -4.4$; $p < 0.001$), and anxiety scores (M = 15.4; SD = 10.6 vs. M = 8.9; SD = 9.2) ($t_{[150]} = -3.6$; $p < 0.001$). No statistically significant difference was observed in SC in A, in any psychopathological issue in B, or in anxiety and SC in C. Frequent means 76-100% of occasions. Not frequent means 0-75% of occasions.

Table 4 Logistic regression models of condom use in sexual intercourse by enrolled excessive sexual behavior (ESB) outpatients and controls (n=152), São Paulo, Brazil

	Model of condom use in vaginal intercourse with main partner		Model of condom use in anal intercourse with main partner		Model of condom use in vaginal intercourse with casual partner		Model of condom use in anal intercourse with casual partner	
	Frequent*	Infrequent	Frequent*	Infrequent	Frequent*	Infrequent	Frequent*	Infrequent
Sexual compulsivity								
OR	Reference	1.00	Reference	1.04	Reference	0.98	Reference	1.07†
95%CI	-	0.94-1.06	-	0.98-1.11	-	0.91-1.05	-	1.01-1.14
Depression								
OR	Reference	0.95	Reference	0.90†	Reference	1.03	Reference	1.05
95%CI	-	0.87-1.03	-	0.81-1.00	-	0.93-1.15	-	0.97-1.13
Anxiety								
OR	Reference	1.00	Reference	1.03	Reference	1.00	Reference	1.02
95%CI	-	0.95-1.07	-	0.96-1.11	-	0.92-1.09	-	0.96-1.08

95%CI = 95% confidence interval; OR = odds ratio.
*76-100%.
†$p < 0.05$.
All models were adjusted for age, race, marital status, sexual orientation, and serological status.

It is important to point out that 16% of the ESB outpatients and 22% of the controls did not engage in sexual intercourse with partners in the last six months. Therefore, the analysis of sexual risk behavior did not account for the whole sample and may have compromised its statistical power to detect differences. It is likely that this is the reason why there were no statistically significant differences among the comparisons between the groups in terms of frequency of vaginal intercourse and condomless vaginal intercourse with casual partners, even though ESB outpatients, particularly straight men, reported more of these behaviors than controls.

A different pattern of psychopathological manifestation emerged from the analysis of sexual risk behavior with main and casual partners. Of great concern, those reporting infrequent condom use with casual partners presented higher psychopathological scores, particularly when engaging in anal intercourse. These findings are consistent with studies that report a direct effect of affect (depression, anxiety)[28,37] and SC[17,30] on HIV risk behavior. Accordingly, anxiety may be associated with sexual risk taking, particularly when considering the anxiety transfer theory, in which anxiety and sexual arousal share some components, and some individuals activate sexual arousal to alleviate anxiety symptoms,[38] thus becoming more prone to sexual risk taking.[28] Depression may also contribute to the activation of sexual behavior,[25] which, in turn, is particularly evident when occurring simultaneously with higher SC.[39] Moreover, several studies have reported increased activation of sexual behavior in individuals with ESB,[40] which is highly correlated with SC. Those presenting greater sexual activation of sexual behavior usually take more risks with HIV transmission.[26,28] Therefore, SC seems to have a particular effect on sexual risk behavior, since it predicted condomless anal intercourse with casual partners in our study. Depression and anxiety did not maintain an association with risk behavior in the logistic regression. This could be because they are correlated with SC and may play an indirect role in sexual risk behavior, for example, increasing SC severity. Our data agree with previous population studies on men who have sex with men (MSM)[17] and with clinical studies on HIV,[21] where SC predicted risky sexual behaviors.

Our data have implications for public health, clinicians, and research. The correlation between anxiety, depression, and SC and their associations with condomless anal intercourse with casual partners support recent studies proposing that HIV risk behavior may be better explained by a syndemic conceptualization, meaning that the risk of acquiring a condition results more from the interaction of several risk factors than the independent effect of individual factors.[22] These data are very important for public health, considering they are related to men of all sexual identities in a psychiatric clinical setting. The correlation between these psychopathological factors is also concerning for clinical purposes, since it increases severity and makes treatment more challenging,[41] particularly considering that such populations present treatment adherence problems. Finally, the correlation between the psychopathological symptoms (anxiety, depression, and SC) contributes to research in the field, because it supports one hypersexual disorder criterion: "repetitively engaging in these sexual fantasies, urges, and behavior in response to dysphoric mood states (e.g., anxiety, depression, boredom, irritability)." The increasing sexual activation particularly associated with these mood symptoms points to the relevance of future research on the mechanisms of sexual desire and arousal in individuals with ESB to improve understanding of the main psychopathological and pathophysiological factors involved.

Our study is based on a clinical convenience sample, which resulted after some individuals who contacted us did not continue the screening process and, thus, we were unable to gather data on them. Those who finished the screening process were included, provided they were literate. These aspects prevent generalization of our data. Unfortunately, there are a few sociodemographic differences among the ESB outpatients and the controls. Specifically, it would be better if we had more balance in the distribution of sexual orientation among the groups, since gay and bisexual men usually report more anxiety, depression, and sexual intercourse.[17] Moreover, we adjusted the logistic regression on sexual risk behavior for age, race, legal marital status, serological status, and sexual orientation to avoid confounding effects. Another limitation of this study is not having investigated childhood adversity. Hypersexual outpatients report more childhood adversity, which is related to depressive symptoms,[42] and both factors may increase the chances of sexual risk behavior. To the best of our knowledge, this is the first study on SC, negative mood, and sexual risk behavior in a psychiatric clinical setting that also includes heterosexual men. Our data emphasize the relevance of investigating SC, anxiety, and depression in individuals seeking ESB treatment, since addressing these psychopathological issues could help prevent HIV transmission.

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Disclosure

The authors report no conflicts of interest.

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