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HIV sexual risk behavior among emerging adults in psychiatric treatment in Brazil

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Abstract

HIV infection among young populations is increasing worldwide. Adolescents in mental health treatment have demonstrated higher rates of HIV risk behavior than their peers. This first risk behavior study of youth in psychiatric treatment in Brazil reports findings from a cross-sectional national sample of emerging adult psychiatric patients (18–25 years old). The prevalence of lifetime unprotected sex was 65.9%. Multiple logistic regression indicated that being married/in union; sex under the influence of alcohol/drugs; physical violence; earlier sexual debut; and depressive/substance use disorders were associated with unsafe sex. Interventions and services that address these risks during this critical developmental window are urgently needed.

Keywords

HIV risk behavior; emerging adults; mental illness; Sexual behavior; Brazil; multicenter national study

INTRODUCTION

The global impact of HIV on young people is staggering. Throughout the world almost one quarter of people living with HIV are under the age of 25. Young people ages 15–24 represent 40% of all new HIV infections (Joint United Nations Program on HIV/AIDS [UNAIDS], 2009), and in that age group 3,500 people are infected with HIV each day (UNAIDS, 2009).

Brazil, the most populous nation in the Latin America and Caribbean region, accounts for about one third of the region's HIV infections (UNAIDS, 2009). As in other countries, Brazil's young population is at considerable risk. A national, representative household

survey showed that 61.6% of youth aged between 16 and 19 had already had sex, the average debut age was 14.9 years, and lack of condom use at first intercourse in casual relationships was 37.4% (Paiva, Calazans, Venturi, & Dias, 2008). One in four adolescents contracted an STD before adulthood (Isolan et al., 2001), and pregnancy among those 15 to 19 years old doubled since 1980 (Freitas, Cais, Stefanello, & Botega, 2008). Among public high school students, not using condoms was reported by 43.3% of those who were substance users and by 34.7% of non-users, 25.2% of all males had sex with sex workers, and 3.2% engaged in sexual economic exchange (Scivoletto et al., 2002).

Studies of adolescents with psychiatric disorders, all conducted in the US, have found higher prevalence of lifetime sexual activity, earlier age of sexual debut, inconsistent condom use and multiple partners compared to youth in the general population (Brown, Danovsky, Lourie, DiClemente, & Ponton, 1997a; Brown, Reynolds, & Lourie, 1997b; Brown, Kessel, Lourie, Ford, & Lipsitt, 1997c; Centers for Disease Control and Prevention [CDC], 2007; Crum, Lillie-Blanton, & Anthony, 1996; Donenberg, Emerson, Bryant, Wilson, & Weber-Shifrin, 2001; Donenberg, Wilson, Emerson, & Bryant, 2002; Donenberg, Bryant, Emerson, Wilson & Pasch, 2003; Donenberg & Pao, 2005; Donenberg et al., 2011). In Brazil, however, rates of sexual risk behaviors in youth and young adults with psychiatric disorders are largely unknown despite findings from a national representative sample that adults in psychiatric treatment are at considerably increased risk of infection with HIV and other sexually transmitted diseases (STD) relative to the general population (Guimarães et al., 2009).

Brazil's integrated response to the epidemic successfully funded health care systems; promoted racial, gender, ethnic, and sexual orientation equality in access to information and treatment; and included public education campaigns and condom promotion resulting in reduced risk among youth (Brazilian Ministry of Health, 2010). National programs to reduce adolescents' vulnerability to HIV/STD achieved 60% compliance from schools in offering strategies for HIV/STD prevention. Although this response led to increased safer sex practices among young people, none of these national projects implemented evidence-based interventions designed specifically for youth with mental health disorders.

General population prevention messages may not be appropriate for adolescents with psychiatric disorders who often struggle with affect management, impoverished self-esteem, substance use, histories of sexual abuse, and mental-illness related stigma (Donenberg & Pao, 2005; Elkington et al., 2012), all factors associated with sexual risk among youth with mental health problems (Donenberg & Pao, 2005). Furthermore, mental health problems and their treatment can result in missing school, especially when hospitalization is required, reducing the likelihood that these youth access school-based HIV prevention programming.

The development and delivery of targeted HIV prevention interventions for youth with mental illness is essential to reduce HIV risk in this vulnerable population. Before such interventions can be developed and sustainably delivered, a critical first step is to define population-specific determinants of risk behavior and points of intervention likely to reach those most in need.

We drew from a national representative sample to examine rates of HIV risk behaviors and correlates of risk in patients ages 18 to 25 receiving care in public psychiatric treatment settings throughout Brazil. Correlates of risk identified in studies of adults with SMI in Brazil (Guimarães, McKinnon, Campos, Melo, & Wainberg, 2010), including sociodemographic, clinical, and behavioral characteristics were examined to ascertain their effects on sexual risk behaviors of younger men and women with psychiatric disorders. We sought to identify risk behaviors and predictors of risk in order to guide service delivery and intervention.

METHODS

Participants and Procedures

The sample of young adults in the current study was drawn from a larger study conducted in Brazil in 2006. This national cross-sectional multicenter study (PESSOAS Project--*HIV Seroprevalence Survey in Mental Health*) examined patients 18 and older with mental illness who were receiving treatment in public psychiatric hospitals and public mental health outpatient clinics, known as Psychosocial Care Centers (CAPS), previously described (Guimarães et al, 2009). Specialized CAPS that treated children or those with primary substance use diagnoses were excluded from the sampling frame due to the possibility of underestimating in the first instance and overestimating in the second selected risk behaviors and/or prevalence rates. Thus, the main study eligibility criteria included inpatients or outpatients 18 years old or over in treatment either at hospitals or adult CAPS who were capable of providing written informed consent and able to respond to a face-to-face questionnaire. Patients' capacity to participate in and understand the aims of the study was evaluated through a preliminary assessment as previously described and ethical approval was obtained from each local Institutional Review Board (IRB), the Federal University of Minas Gerais IRB (UFMG/ETIC125/03) and the National Ethical Review Board (CONEP 592/2006).

The total sample ($n = 2475$) was obtained using a two-stage sampling strategy which has been described elsewhere (Guimarães et al., 2009). Among these, 267 (10.8%) patients between the ages of 18 and 25, ages, which have been characterized as emerging adulthood (Wilson, Wright, Safrit, & Rudy, 2010), were included in this analysis.

Measures

We obtained self-report data from face-to-face interviews conducted by experienced and trained mental health care professionals using a pre-tested semi-structured interview designed specifically for this study with demonstrated reliability (Guimarães et al., 2008). Variables shown to be associated with risk in the Brazilian adult psychiatric sample were selected for this analysis (Guimarães et al., 2010), including sociodemographic characteristics (e.g. age, gender, race, marital status, schooling, income, homeless history, and housing); clinical characteristics (e.g. hospitalization, age at first psychiatric hospitalization or outpatient care, main psychiatric diagnosis, STD history, previous HIV testing); and behavioral characteristics (e.g. sexual practices, including age of sexual debut and condom use, alcohol, tobacco and illicit substance use, history of verbal physical and

sexual violence, exchange of sex for drugs/money, sex under the influence of alcohol/drugs, history of incarceration, HIV knowledge, and risk perception).

Psychiatric diagnoses were obtained from medical charts; diagnoses were coded according to the International Statistical Classification of Diseases and Related Health Problems, 10th revision (World Health Organization [WHO], 2004), the standard reference for public psychiatric services in Brazil. When more than one psychiatric diagnosis was present, these were hierarchically grouped according to clinical severity as follows: 1. schizophrenia and other psychotic disorders; 2. bipolar disorder; 3. depression; 4. anxiety; 5. substance use disorder; 6. others.

HIV/AIDS knowledge was assessed through ten true or false questions; good HIV/AIDS knowledge was defined as having eight or more correct answers, while having a score of seven or less was considered poor HIV/AIDS knowledge (Melo et al., 2010). Perception of risk was self-defined as high, low or no risk.

Behavioral variables were assessed in two time frames, lifetime and in the past six months (i.e., recent), and included condom use; types of sexual and drug use practices; number of partners; alcohol, tobacco, and illicit substance use; and history of verbal, physical and sexual violence. Good to excellent reliability was found for all self-report data for both recent and lifetime risk behaviors as well as for history of HIV testing and HIV/STDs (Guimarães et al., 2008). Condom use was assessed as: always, sometimes (more than 50% of the times), rarely (less than 50% of the times) and never. This approach has demonstrated reliability with psychiatric patients in Brazil (Guimarães et al., 2008). Given small cell sizes of some ordinal range values of condom use, we collapsed categories and created a dichotomous variable for the current analysis. Thus, we defined unprotected sex as not always using condoms for both lifetime (lifetime unprotected sex) or in the past six months, contrasted with always using condoms (both look-back periods). Those who had no sex were classified in the no risk group for both lifetime and past six months analyses.

Data Analysis

Descriptive analysis was carried out and chi-square tests were used for the analysis of categorical data. The magnitude of the associations between risk factors and unsafe sexual behavior was estimated by the odds ratio (*OR*) with 95% confidence interval (95% *CI*). The level of significance considered was 0.05. The independent effect of potential explanatory variables was assessed by multiple logistic regression. All variables with *p*-values equal to or less than 0.20 obtained in the univariate analysis were used to start multivariate modeling. A backward deletion strategy was applied and those variables with *p*-values equal to or less than 0.05 remained in final model. Adequacy of the final model was evaluated using the Hosmer-Lemeshow test (Hosmer & Lemeshow, 1989) while SAS System® was used for data analysis and Paradox® Windows for database.

RESULTS

Sample and Psychiatric Characteristics

Table 1 presents demographic, clinical and sexual behavior characteristics of the total sample and by gender. Among the 267 patients aged 18-25, 51.3% were recruited from CAPS (Psychosocial Care Centers). Most were male (58.8%), non-white (52.8%), with less than five years of education (71.2%). While the majority lived with their families or relatives (93.3%), 18.3% had some experience of homelessness, with a significantly higher proportion among men. More than one-third (37.7%) had monthly family income lower than the Brazilian minimum wage (US\$200). The majority was single (83.2%), although significantly more females than males reported being married/in union. Previous psychiatric hospitalization was reported by 46.8% of the sample, and about one-quarter of the participants (25.8%) had their first contact with mental health services (hospitalization or outpatient care) before the age of 18; more young men reported prior hospitalizations and were also more likely than women to be recruited from a hospital. Psychoses and bipolar disorder were the most common psychiatric diagnoses (57.7%), followed by depressive and substance use disorders (16.1%); with a greater proportion of psychosis/bipolar disorder among men. For those recruited in the hospital setting, 62.1% were hospitalized for less than one month ($M = 6.29$ months; median = 0.67 months), while for those recruited from CAPS, 68.1% were under care for more than 12 months ($M = 28.78$ months; median = 22.9 months).

Sexual Risk Behavior

Most participants (77.1%), were sexually active (lifetime), with 76.7% reporting their first sexual intercourse before 18 years old. A large proportion reported unprotected sex in the past six months (44.6%) or lifetime (65.9%), with 60.2% reporting more than one partner, 34.1% reporting sex under the influence of drugs or alcohol, and 29.6% reporting the exchange of sex for money (all lifetime). Refusal of condom use by partners was reported by 39.2% of participants and less than half used condoms at the last intercourse. Young men and women had similar rates of sexual activity (lifetime); sexual debut before age 18; unprotected sex (lifetime); and number of sexual partners (lifetime). However, comparing unprotected sex in the past six months, young women were significantly less likely than young men to always use condoms during sex or to abstain from sex. Rates of sex under the influence of drugs or alcohol and sexual exchange for money or drugs also differed by gender, with more males reporting both behaviors; more men reported having sex with both men and women (32.2%).

Almost one-quarter of participants reported a history of incarceration (24.3%), while 43.8% reported illicit drug use, 64.4% tobacco use, and 71.1% alcohol use. Lifetime violence was reported by participants: sexual (23.2%) - most of which occurred during childhood (43.3%); physical (64.0%); and verbal (65.9%). Finally, 60.7% of participants had good HIV/AIDS knowledge and 38.3% perceived themselves to be highly or somewhat at risk for HIV/AIDS. Close to fifteen percent of participants had a history of STD; only 28.5% had been previously HIV tested. More young men reported a history of incarceration, illicit drug

use, and smoking. In contrast, more young women reported a lifetime history of sexual violence and more had received an HIV test in the past.

Univariate and Multivariate Analyses

Univariate analyses indicated that the proportion of lifetime unprotected sexual activity in this group of young adults with mental illness was statistically higher among those who were older (22-25 years old), married or in a committed union, literate, currently hospitalized, and with depressive/substance use psychiatric diagnoses. In addition, those with a history of STDs, who were younger at sexual debut, reported more than one sexual partner, and who had practiced sex under the influence of alcohol or drugs also had a higher proportion of unsafe sex. Patients reporting refusal by partners to use condoms, exchange of sex for money, history of incarceration, and illicit drug, alcohol or tobacco use also showed statistically higher proportions of unsafe sex. Finally, those with a history of sexual, physical or verbal violence, previous HIV testing, or better HIV/AIDS knowledge showed higher rates of unprotected sex (Table 2). Similar variables were associated with unprotected sex in the past six months except for age, age of first intercourse and treatment setting (inpatient versus outpatient). On the other hand, gender (female) and sexual behavior (sex with men only) were associated with unprotected sex in the past six months only.

Although there were no significant differences by gender in lifetime rates of unprotected sex, for our multivariate analyses, we adjusted our lifetime final model for gender because of potential underlying differences among other factors and also to better compare with the past six months period model. The multivariate analysis indicated five variables which were independently associated ($p < .05$) with lifetime unsafe sexual behavior in this population (Table 3) after adjusting for all variables associated with unprotected sexual risk at the $p < .20$ in the univariate analysis: being married/in union ($OR = 5.26$; 95% CI [1.38 - 22.11]); having had sex under the influence of alcohol/drugs ($OR = 4.49$; 95% CI [1.76 - 11.44]); a history of physical violence ($OR = 2.20$; 95% CI [1.00 - 4.87]); earlier sexual debut ($OR = 3.21$; 95% CI [1.30 - 7.90]); and those with psychiatric diagnoses of depressive/substance use disorders ($OR = 4.53$; 95% CI [1.08 - 19.05]). Multivariate analyses for condom use in the past 6 months also yielded five variables that were significantly associated with condom use. In contrast to lifetime condom use, gender ($OR = 2.68$) and number of sexual partners ($OR = 5.68$) remained in the final model along with being married/in union ($OR = 10.20$; 95% CI [3.62 - 28.75]); having had sex under the influence of alcohol/drugs ($OR = 4.86$; 95% CI [2.37 - 9.45]); and those with psychiatric diagnoses of depressive/substance use disorders ($OR = 4.53$; 95% CI [1.08 - 19.05]), whereas age of first sex and physical violence were only significant in the lifetime analysis.

DISCUSSION

In the first study of HIV risk behaviors among youth with psychiatric disorders in Brazil, emerging adults in public mental health care in Brazil showed high rates of lifetime HIV risk behaviors, including a high rate of unprotected sex, and several important correlates of risk, which suggest directions for targeted intervention development and service delivery.

Three-quarters of participants were sexually active and reported sexual debut before age 18. Most had more than one partner in their lifetime, and one-third had ever had sex under the influence of drugs or alcohol. Exchanging sex for money or drugs was common, and unprotected sex was typical for both lifetime and recent intercourse. Risk behavior rates from this national multicenter sample are considerably higher than those found in other Brazilian samples, both psychiatric adults (Wainberg et al., 2008) and non-psychiatric youth (Scivoletto et al., 2002; Isolan et al., 2001; Paiva et al., 2008). Interestingly, all of these risks occurred in the context of good AIDS knowledge and self-appraisals of being at considerable risk for HIV infection. Consistent with other populations (Tung, Lu, & Cook, 2010), these findings suggest that while important, providing knowledge about HIV/AIDS and increasing the population's self-perception of HIV risk is not sufficient to reduce sexual risk behavior. Finally, partner refusal to use condoms was not associated with risk behavior in this sample. HIV prevention interventions for younger psychiatric patients must go beyond teaching condom negotiation skills and address other salient barriers to condom use, such as sex under the influence of drugs or alcohol and multiple forms of violence.

Lifetime unprotected sex was increased among those with a history of physical violence by more than twofold, among those with earlier sexual debut by more than three-fold, and among those with depressive/substance use disorders or who reported sexual activity under the influence of alcohol/drugs by close to five-fold. These findings are consistent with studies of youth with psychiatric disorders in the US (Donenberg & Pao, 2005) as well as studies of adults with severe mental illness (Guimarães et al., 2010; Wainberg et al., 2008) and general population youth in Brazil (Scivoletto et al., 2002; Isolan et al., 2001; Paiva et al., 2008). Thus, physical violence, early sexual debut, substance use and depression/substance use disorders may serve as early warning signs of future HIV risk behavior among these youth. Although psychiatric diagnosis did not appear to be as sensitive a predictor of HIV risk behavior as psychiatric symptoms among adult psychiatric patients (McKinnon, Cournos, Sugden, Guido & Herman, 1996), for younger people in psychiatric treatment certain disorders may be important indicators of sexual risk and should be examined along with symptoms in future studies of youth.

Despite this study's sampling frame, which did not include CAPS specializing in the treatment of substance use disorders, substance use was common, with nearly half reporting lifetime illicit drug use. Regardless of whether patients 18-25 meet criteria for a substance use disorder, use of substances may be an important point of entry for intervention given the enormous risk increase attributable to both having sex under the influence of alcohol/drugs and having a psychiatric diagnosis of depressive/substance use disorders in this sample. Targeting use of substances in these outpatient mental health settings would offer patients needed support in an ongoing way to employ harm reduction approaches, particularly to the extent that substance use is associated with sex exchange and incarceration which were common in this sample and which are highly associated with increased HIV risk.

As in many other studies, to be married/in union was associated with increased odds of practicing unprotected sex for both time frames. Globally, most people are married and married people have the most sex, but the growing prevalence of sex outside marriage underscores the fact that marriage does not reliably safeguard sexual-health status (Higgins,

Barker, & Begley, 2006). For couples in committed relationships, particularly when one or both partner has a psychiatric illness, interventions that encourage the introduction of condoms within a partnership may be framed on the basis of caring and concern for both partners to protect each other until HIV testing can be completed and even afterward in the context of ongoing contraception. Although resistance or even violence sometimes are concerns in such unions, for most people in psychiatric care condom negotiation skills can be learned and practiced safely and successfully (Senn & Carey, 2008).

There were some key differences in risk correlates by gender that warrant further study. For example, young women were more likely to be below the Brazilian National poverty line, and report a lifetime of sexual violence and more unprotected sex in the past 6 months, whereas young men were more likely to report using substances, being drunk or high when engaging in sexual intercourse and offering money in return for sexual services. These differences in risk correlates suggest that interventions may need to be tailored for young psychiatric patients taking gender into consideration. The current study was not able to examine differences in patterns of risk correlates by gender and their relation to sexual risk given sample size and power limitations. However, we should point out that for the six-month look-back period, women were more likely to practice unprotected sex. This difference (lifetime and six months period) may be explained by the episodic nature of sex for psychiatric patients (Perry & Wright, 2006). Future research is required to tease apart unique factors associated with sexual risk separately for young men and women receiving care in public psychiatric treatment settings.

Other study limitations may have affected our findings in ways that are important for investigators, service providers, and policy makers to consider. Psychiatric diagnosis was obtained from patients' medical records and therefore may reflect patients' ongoing clinical pictures rather than their functioning at the time of the in-person interview. In addition, risk behaviors elicited occurred during time-frames that did not necessarily coincide with patients' psychiatric condition or functioning at the time they were characterized; as such, associations between risk and clinical characteristics should not be construed as temporally related. Further, the sample was not obtained with the developmental and other specific needs of youth as its focus of study; our analysis therefore is limited to those who fit the age profile of emerging adults. Finally, we did not have sufficient statistical power to conduct sub-analyses for contextual variables of potential importance to development of prevention service or for lower-frequency behaviors.

Despite these limitations, findings from the current study have important implications for intervention development and delivery. Although school-based prevention programs have been launched within the school system in Brazil, condom distribution in compliant schools is extremely low (9%) (Paiva et al., 2008; Brazilian Ministry of Health & Brazilian Ministry of Education, 2007), and schools operate these programs under restrictions and regulations regarding openly discussing sexual practices. Given that less than one-third of our sample had more than five years of schooling (equivalent to 5th grade), it seems unlikely that youth with psychiatric disorders will benefit from such school-based programs. Therefore, opportunities to prevent development of sexual risk patterns and networks via delivery of targeted intervention programs within the psychiatric system may be a viable

implementation strategy to meet the needs of these emerging adults. A systematic review of HIV interventions for young people in developing countries found that interventions targeting youth delivered through existing organizations or centers were mostly likely to be sustainable and yield reduced risk compared to interventions that created new systems and structures (Maticka-Tyndale & Brouillard-Coyle, 2006).

Given that inpatient and outpatient psychiatric treatment settings in Brazil showed no differences in their patients' HIV-related risks and behaviors, and that lengths of stay on inpatient units are not pre-determined, interventions could be initiated during inpatient stays and continued and expanded once patients move into outpatient care. In particular, screening and testing for HIV is an important intervention that psychiatric hospitals are more likely to have the infrastructure to carry out than outpatient clinics, and inpatient staffing levels better suited to support patients who test HIV-positive (Melo, McKinnon, Wainberg, César, & Guimarães, 2012). Efficacious behavioral interventions that have been developed for adults with severe mental illness were only tested in outpatient settings with stabilized patients and require multiple sessions (4-15); although by design these interventions may be more appropriate for delivery in outpatient settings (Kalichman, Sikkema, Kelly, & Bulto, 1995; Wainberg et al., 2007), they could be adapted to inpatient settings in Brazil.

Because the public mental health system in Brazil treats a range of conditions including developmental and neurological as well as severe mental illness and affective disorders, inclusion of HIV prevention services may fit most readily within its purview. Results from this study suggest important potential windows of intervention to reduce the impact of HIV infection on young people with mental illness before sexual risk behavior becomes an established pattern of behavior. The public health system is where psychiatric care is delivered to the majority of youth with psychiatric diagnoses in Brazil. Public mental health care settings are critical loci of stemming the HIV epidemic among those highly vulnerable to HIV infection and other negative health outcomes and should be included in prevention planning and policy decisions as part of the public health response to AIDS.

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Table 1

Descriptive analysis of psychiatric emerging adult patients (18-25 y.o.) in Brazil, 2006.

Characteristics	TOTAL (N=267)		Young Women (n=110)	Young Men (n=157)	X ² (p-value) ^a
	N	%	n(%)	n(%)	
Sociodemographic					
Age (years old):					
18-21	94	35.2	42(61.8)	53(33.1)	0.72
22-25	173	64.8	68(38.2)	105(66.9)	(.394)
Race:					
White	126	47.2	58(52.7)	68(43.3)	2.30
Non-white	141	52.8	52(47.3)	89(56.7)	(.129)
Marital status:					
Married or in union	45	16.8	34(30.9)	11(7.0)	26.4
Single	222	83.2	76(69.1)	146(93.0)	(< .01)**
Know how to read/write:					
Yes	230	86.1	10(9.1)	27(17.2)	3.66
No	37	13.8	100(90.9)	130(82.8)	(.060)
Schooling (years):					
< 5	190	71.2	27(24.6)	50(31.9)	1.68
5	77	28.8	83(75.5)	107(68.2)	(.195)
Family income in the last month: ^b					
1 MW	157	62.3	66(61.7)	91(62.8)	0.03
< 1 MW	95	37.7	41(38.3)	54(37.2)	(.862)
Place of residence:					
Home with family/relatives	249	93.3	105(95.5)	144(91.7)	1.43
Other places	18	6.7	5(4.5)	13(8.3)	(.231)
Lifetime homelessness:					
Yes	49	18.3	13(11.8)	36(22.9)	5.33
No	218	82.2	97(88.2)	121(77.1)	(.021)*
Clinical					
Type of recruitment center:					
Hospital	130	48.7	39(35.5)	91(58.0)	13.1
CAPS	137	51.3	71(64.6)	66(42.0)	(<0.01)*
Previous psychiatric hospitalization:					
Yes	125	46.8	41(37.3)	84(53.5)	6.84
No	142	53.2	69(62.7)	73(46.5)	(< .01)**
Age of first hospital or psychiatric visit:					
<18	62	25.8	21(20.8)	41(29.5)	2.31
18	178	74.2	80(79.2)	98(70.5)	(.128)
Psychiatric diagnosis:					

Characteristics	TOTAL (N=267)		Young Women (n=110)	Young Men (n=157)	X ² (p-value) ^a
	N	%	n(%)	n(%)	
Psychosis/Bipolar Disorder	154	57.7	52(47.3)	102(65.0)	8.47
Depressive disorders/Substance use	43	16.1	21(19.1)	22(14.0)	(0.1) *
Others	70	26.2	37(33.6)	33(21.0)	
History of STD:					
Yes	39	14.7	17(15.5)	22(14.1)	0.09
No	227	85.3	93(84.6)	134(85.9)	(.759)
<i>Behavioral</i>					
Lifetime sexually active:					
Yes	206	77.1	84(76.4)	122(77.7)	0.07
No	61	22.9	26(23.6)	35(22.3)	(.797)
Age of first sex (years old):					
<18	151	76.7	64(78.0)	87(75.7)	0.154
18	46	23.3	18(22.0)	28(24.3)	(.695)
Lifetime condom use:					
Abstinent	61	22.9	26(23.6)	35(22.3)	3.25
Always	30	11.2	10(9.1)	20(12.7)	(.517)
Sometimes	60	22.5	30(27.3)	30(19.1)	
Rarely	71	26.6	27(24.6)	44(28.0)	
Never	45	16.9	17(15.5)	28(17.8)	
Condom use past six months					
Abstinent(ever)	61	23.3	26(23.8)	35(22.9)	14.04
Abstinent(past six months)	48	18.3	10(9.2)	38(24.8)	(.01) *
Always	36	13.7	13(11.9)	23(15.0)	
Sometimes	28	10.7	16(14.7)	12(7.8)	
Rarely	33	12.6	16(14.7)	17(11.1)	
Never	56	21.4	28(25.7)	28(18.3)	
Unprotected sex in the last 6 months: ^c					
Yes	117	44.6	60(55.0)	57(37.3)	8.15
No	145	55.4	49(45.0)	96(62.7)	(<.01) **
Lifetime unprotected sex: ^c					
Yes	176	65.9	74(67.3)	102(65.0)	0.153
No	91	34.1	36(32.7)	55(35.0)	(.696)
Unprotected sex in the last 6 months: ^d					
Yes	117	76.5	60(82.2)	57(71.3)	2.54
No	36	23.5	13(17.8)	23(28.7)	(.110)
Sexual behavior: ^e					
With men only	76	38.4	70(87.5)	6(5.1)	139.5
With women only	76	38.4	2(2.5)	74(62.7)	(<.01) **
With men and women	46	23.2	8(10.0)	38(32.2)	

Characteristics	TOTAL (N=267)		Young Women (n=110)	Young Men (n=157)	X ² (p-value) ^a
	N	%	n(%)	n(%)	
Number of sexual partners ever:					
>1	156	60.2	60(56.6)	96(62.7)	0.986
1	103	39.8	46(43.4)	57(37.3)	(.321)
Sex under influence of drug or alcohol:					
Yes	91	34.1	30(27.3)	61(38.9)	3.86
No	176	65.9	80(72.3)	96(61.1)	(.05)*
Refusal of condom use by partner: ^e					
Yes	80	39.2	43(51.8)	37(30.6)	9.30
No	124	70.8	40(48.2)	84(69.4)	(<.01)**
Condom use in last sexual encounter: ^d					
Yes	93	46.0	34(41.0)	59(49.6)	1.46
No	109	54.0	49(59.0)	60(40.4)	(.227)
Received or offered money for sex:					
Yes	79	29.6	25(22.7)	54(34.4)	4.22
No	188	70.4	85(77.3)	103(65.6)	(.039)*
History of incarceration:					
Yes	65	24.3	8(7.3)	7(36.3)	29.6
No	202	75.7	102(92.7)	100(63.7)	(<.01)**
Lifetime illicit drug use:					
Yes	117	43.8	29(26.4)	88(56.0)	23.2
No	150	56.2	81(73.6)	69(44.0)	(<.01)**
Lifetime injection drug use:					
Yes	10	3.8	3(2.7)	7(4.5)	0.55
No	256	96.2	107(97.3)	149(95.5)	(.457)
Lifetime cigarette smoking:					
Yes	170	64.4	63(57.3)	107(69.5)	4.17
No	94	35.6	47(42.7)	47(30.5)	(.04)*
Lifetime alcohol use:					
Yes	190	71.1	75(68.2)	115(73.3)	0.809
No	77	28.8	35(31.8)	42(26.7)	(.368)
Lifetime sexual violence:					
Yes	61	23.2	35(32.4)	26(16.8)	8.73
No	202	76.8	73(67.6)	129(83.2)	(<.01)**
Time of sexual violence:					
Childhood	26	43.3	11(32.3)	15(57.7)	4.17
Adolescence	21	35	15(44.1)	6(23.1)	(0.12)
Adulthood	13	21.7	8(23.5)	5(19.2)	
Lifetime verbal violence:					

Characteristics	TOTAL (N=267)		Young Women (n=110)	Young Men (n=157)	X ² (p-value) ^a
	N	%	n(%)	n(%)	
Yes	176	65.9	76(69.1)	100(63.7)	0.85
No	91	34.1	34(30.9)	57(36.3)	(.360)
Lifetime physical violence:					
Yes	171	64.0	64(58.2)	107(68.2)	2.79
No	96	36.0	46(41.8)	50(31.8)	(.090)
Previous HIV testing:					
Yes	76	28.5	43(39.1)	33(21.0)	10.4
No	191	71.5	67(60.9)	124(79.0)	(<.01) **
HIV/AIDS knowledge:					
Poor	162	39.3	69(62.7)	93(59.2)	0.33
Good	105	60.7	41(37.3)	64(40.8)	(.565)
HIV risk self-perception:					
High	98	38.3	41(38.7)	57(38.0)	0.01
None	158	61.7	65(61.3)	93(62.0)	(.912)

^a Note: Comparing young women and young men; Statistically significant

* $p < .05$,

** $p < .01$

^b MW=Minimum wage (US\$200)

^c Not always using condoms

^d Among those sexually active in the past six months

^e Among those sexually active ever

Table 2

Univariate analysis of lifetime unprotected sex and in the past six months among psychiatric emerging adult patients (18-25 y.o.) in Brazil, 2006.

Characteristics	LIFETIME UNPROTECTED SEX			UNPROTECTED SEX IN THE PAST SIX MONTHS		
	Total ^a	N (%) ^b	Odds Ratio [95% CI] ^c	Total ^a	N (%) ^d	Odds Ratio [95% CI] ^c
Age (years old):						
18-21	94	53 (56.4)	1.00	92	37 (40.2)	1.00
22-25	173	123 (71.1)	1.90 [1.13, 3.21]*	170	80 (47.0)	1.32 [0.79, 2.20]
Gender:						
Female	110	74 (67.3)	1.11 [0.66, 1.86]	109	60 (55.1)	2.06 [1.25, 3.40]**
Male	157	102 (65.0)	1.00	153	57 (37.3)	1.00
Race:						
White	126	81 (64.3)	0.87 [0.53, 1.45]	124	52 (41.9)	0.81 [0.49, 1.32]
Non-white	141	95 (67.4)	1.00	138	65 (47.1)	1.00
Marital status:						
Married or in union	45	42 (93.3)	9.19 [2.76, 30.58]**	45	38 (84.4)	9.48 [4.04, 22.23]***
Single	222	134 (60.4)	1.00	217	79 (36.4)	1.00
Know how to read/write:						
No	37	19 (51.4)	0.49 [0.24, 0.99]	37	11 (29.7)	0.47 [0.22, 1.01]
Yes	230	157 (68.3)	1.00	225	106 (47.1)	1.00
Schooling (years):						
5	190	128 (67.4)	1.25 [0.72, 2.17]	186	86 (46.2)	1.24 [0.72, 2.14]
<5	77	48 (62.3)	1.00	76	31 (40.8)	1.00
Family income in the last month ^e :						
1 MW	157	110 (70.1)	1.43 [0.84, 2.44]	155	70 (45.2)	0.93 [0.55, 1.57]
< 1 MW	95	59 (62.1)	1.00	92	43 (46.7)	1.00
Place of residence:						
Home with family/relatives	249	167 (67.1)	2.04 [0.78, 5.32]	246	112 (45.5)	1.83 [0.62, 5.45]
Others	18	9 (50.0)	1.00	16	5 (31.2)	1.00
Lifetime homelessness:						
Yes	15	11 (73.3)	1.45 [0.45, 4.69]	48	24 (50.0)	1.30 [0.69, 2.43]
No	252	165 (65.5)	1.00	214	93 (43.4)	1.00
Type of recruitment center:						

Characteristics	LIFETIME UNPROTECTED SEX			UNPROTECTED SEX IN THE PAST SIX MONTHS		
	Total ^a	N (%) ^b	Odds Ratio [95% CI] ^c	Total ^a	N (%) ^d	Odds Ratio [95% CI] ^c
Hospital CAPS	130 137	95 (73.1) 81 (59.1)	1.88 [1.12, 3.14]* 1.00	128 134	62 (48.4) 55 (41.0)	1.34 [0.82, 2.19] 1.00
Previous psychiatric hospitalization:						
Yes	125	88	1.46 [0.88,	121	55 (45.4)	1.06 [0.65,
No	142	(70.4) 88 (62.0)	2.44] 1.00	141	62 (43.9)	1.73] 1.00
Age of first hospitalization or psychiatric visit:						
18	178	121	1.25 [0.68,	176	86 (48.8)	1.82 [0.99,
<18	62	(68.0) 39 (62.9)	2.29] 1.00	61	21 (34.4)	3.33] 1.00
Psychiatric diagnosis:						
Others	70	38	1.00	69	24 (34.8)	1.00
Psychosis/Bipolar Disorder	154	(54.3)	1.56 [0.88,	152	64 (42.1)	1.36 [0.76 –
Depressive	43	100	2.77]	41	29 (70.7)	2.46]
disorders/Substance use		(64.9) 38 (88.4)	6.40 [2.25, 18.19]***			4.53 [1.96 – 10.44]***
History of STD:						
Yes	39	33	3.29 [1.33,	***39	26	2.87 [1.40,
No	227	(84.6) 142 (62.6)	8.18]** 1.00	222	(66.7) 91 (40.9)	5.90]** 1.00
Age of first sex (years old): ^f						
<18	151	134	2.78 [1.21,	150	90 (60.0)	1.25 [0.63,
18	46	(88.7) 34 (73.9)	6.38]* 1.00	44	24 (54.6)	2.46] 1.00
Sexual behavior: ^f						
Women only	76	62 (81	1.0	73	36 (49.3)	1.0
Men only	76	.6)	1.49 [0.62,	76	53 (69.7)	2.37 [1.21 –
Both	46	66(86. 8) 40(87. 0)	3.60] 1.51 [0.53, 4.24]	46	26 (56.5)	4.63]* 1.34 [0.64 – 2.81]
Number of sexual partners ever:						
>1	156	137	16.75 [8.85,	154	96 (62.3)	7.23 [3.99,
1	103	(87.8) 31 (30.1)	31.71]** 1.00	102	19 (18.6)	13.12]** 1.00
Sex under the influence of drug or alcohol:						
Yes	91	83	9.26 [4.23,	91	65 (71.4)	5.72 [3.27,
No	176	(91.2) 93 (52.8)	20.27]** 1.00	171	52 (30.4)	10.01]** 1.00
Refusal of condom use by partner (ever): ^f						

Characteristics	LIFETIME UNPROTECTED SEX			UNPROTECTED SEX IN THE PAST SIX MONTHS		
	Total ^a	N (%) ^b	Odds Ratio [95% CI] ^c	Total ^a	N (%) ^d	Odds Ratio [95% CI] ^c
Yes	80	74	2.96 [1.15,	80	55 (68.8)	2.06 [1.14 –
No	124	(92.5)	7.61]*	120	62 (51.7)	3.72]*
		100	1.00			1.00
		(80.7)				
Received/offered money for sex:						
Yes	79	69	5.22 [2.53,	77	48 (62.3)	2.78 [1.61,
No	188	(87.3)	10.77]***	185	69 (37.3)	4.82]***
		107	1.00			1.00
		(56.9)				
History of incarceration						
Yes	65	52	2.52 [1.29,	63	35 (55.6)	1.78 [1.01,
No	202	(80.0)	4.92]**	199	82 (41.2)	3.16]*
		124	1.00			1.00
		(61.4)				
Lifetime illicit drug use:						
Yes	117	102	6.98 [3.72,	113	67 (59.3)	2.88 [1.74,
No	150	(87.2)	13.11]**	149	50 (33.6)	4.79]***
		74	1.00			1.00
		(49.3)				
Lifetime injection drug use:						
Yes	10	9	4.80 [0.60,	9	7 (77.8)	4.52 [0.92,
No	256	(90.0)	38.47]	252	110 (43.7)	22.18]
		167	1.00			1.00
		(65.2)				
Lifetime cigarette smoking:						
Yes	170	133	4.26 [2.47,	166	89 (53.6)	2.68 [1.57,
No	94	(78.2)	7.36]**	93	28 (30.1)	4.59]***
		43	1.00			1.00
		(45.7)				
Lifetime alcohol use:						
Yes	190	148	6.17 [3.46,	185	99 (53.5)	3.77 [2.07,
No	77	(77.9)	10.98]**	77	18 (23.4)	6.89]***
		28	1.00			1.00
		(36.4)				
Lifetime sexual violence:						
Yes	61	50	2.98 [1.46,	61	40 (65.6)	3.08 [1.69,
No	202	(82.0)	6.07]**	199	76 (38.2)	5.62]***
		122	1.00			1.00
		(60.4)				
Lifetime verbal violence:						
Yes	176	129	2.57 [1.51,	173	86 (49.7)	1.85 [1.09,
No	91	(73.3)	4.36]**	89	31 (34.8)	3.14]*
		47	1.00			1.00
		(51.7)				
Lifetime physical violence:						
Yes	171	125	2.40 [1.42,	168	84 (50.0)	1.85 [1.10,
No	96	(73.1)	3.05]*	94	33 (35.1)	3.11]*
		51	1.00			1.00
		(53.1)				

Previous HIV testing:

Characteristics	LIFETIME UNPROTECTED SEX			UNPROTECTED SEX IN THE PAST SIX MONTHS		
	Total ^a	N (%) ^b	Odds Ratio [95% CI] ^c	Total ^a	N (%) ^d	Odds Ratio [95% CI] ^c
Yes	76	60	2.43 [1.30,	75	40 (53.3)	1.63 [0.95,
No	191	(79.0)	4.52]*	187	77 (41.2)	2.80]
		116	1.00			1.00
		(60.7)				
HIV/AIDS knowledge:						
Good	162	116	1.89 [1.13,	158	81 (51.3)	1.99 [1.19,
Poor	105	(71.6)	3.17]*	104	36 (34.6)	3.31]**
		60	1.00			1.00
		(57.1)				
HIV risk self-perception:						
High	98	68	1.14 [0.67,	97	45 (46.4)	1.05 [0.63,
Low	158	(69.4)	1.97]	155	70 (45.2)	1.75]
		105	1.00			1.00
		(66.5)				

^a Notes: Total population studied

^b Number and proportion of lifetime unprotected sex in each category. Safe includes abstinent ever

^c 95% CI= 95% confidence interval, Statistically significant:

* p < .05,

** p < .01,

*** p < .001

^d Number and proportion of unprotected in the past six months in each category. Safe includes abstinent ever and abstinent in the past six months

^e MW=Minimum wage (US\$200)

^f Among those sexually active ever

Table 3

Multivariate analysis of unprotected sex (lifetime and in the past six months) among psychiatric emerging adult patients (18-25 y.o.) in Brazil, 2006.

Characteristics	LIFETIME ^a	PAST SIX MONTHS ^b
	Odds Ratio [95% CI]	Odds Ratio [95% CI]
Gender (female)	0.96 [0.42, 2.19]	2.68 [1.31, 5.48] ***
Marital Status (married/in union):	5.26 [1.38, 22.11] *	10.20 [3.62, 28.75] **
Sex under the influence of drug or alcohol:	4.49 [1.76, 11.44] **	4.86 [2.37, 9.45] ***
Lifetime physical violence:	2.20 [1.00, 4.87] *	-
Age of first sex (< 18 y.o.):	3.21 [1.30, 7.90] ***	-
Psychiatric diagnosis:		
Depressive disorders/Substance use	4.53 [1.08, 19.05] *	4.69 [1.66, 13.23] **
Psychosis/Bipolar Disorder	1.08 [0.45, 2.55]	1.55 [0.72, 3.36]
Number sexual partners (> 1)	-	5.68 [2.63, 12.55] ***

^aNotes: Safe includes abstinent ever. Hosmer-Lemeshow test=6.22, 7df, p = .511

^bSafe includes abstinent ever and abstinent in the past six months. Hosmer-Lemeshow test=2.26, 7df, p = .941

^c95% CI= 95% confidence interval, Statistically significant:

* p < .05,

** p < .01,

*** p < .001