

Sexual and Drug Use Risk Behaviors among Children and Youth in Street Circumstances in Porto Alegre, Brazil

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Abstract We conducted a cross-sectional study to assess sexual and drug use risk in 161 children and youth in street circumstances in Porto Alegre, Brazil. Median age was 14 and 79% were male. Overall, 59% reported ever having had sex; a significantly higher proportion of males (66%) compared to females (30%). Overall, 39.7% reported illicit drug use in the last year, and only 1.2% reported injection drug use. In multivariate analyses, correlates of unsafe sex included younger age of sexual debut, and having a steady sex partner. Independent correlates of illicit drug use included lack of family contact, increased hours in the street daily, having had an HIV test, and older age. A high proportion of children and youth in street circumstances reported high risk sex and drug exposures, confirming their vulnerability to HIV/STD. Services Centers, such as

where this research was carried out, offer an opportunity for interventions.

Keywords Street children and youth · Street circumstances · Vulnerability · HIV · Sexual risk · Drug use

Introduction

Worldwide, the number of children and youth who live or work in the streets, usually in urban or semi-urban locations is known to be substantial. UNICEF has estimated that there could be up to 40 million in Latin America (Ortiz and Poertner, 1992). In Brazil, children and youth who live, work or spend large amounts of time in the street, are referred as “children in street circumstances” (*Crianças em situação de rua*; Koller and Hutz, 1996; Martins, 1996; Neiva-Silva and Koller, 2002). A national survey about drug use patterns among children and youth in street circumstances found 2,807 children or youth living on the street in the urban areas (Noto *et al.*, 2004). A host of complex circumstances usually lead youth to migrate to the streets, sometimes far away from their homes, including familial problems and instability, conflict and abuse (Raffaelli, 1997). A key factor is familial socioeconomic deterioration, forcing many children and youth to search for work on streets in order to help their families earn money (Silva *et al.*, 1998). Youth in street circumstances are often transient and perform unskilled jobs (Neiva-Silva and Koller, 2002) and often drop out of school (Alves *et al.*, 2002; Noto *et al.*, 2004). In Brazil, a large proportion (68%) of children and youth in street circumstances spend a majority of time in the street during the day, but frequently they keep some kind of contact with their families,

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sometimes going home to sleep (Forster Tannhauser, and Barros, 1996; Noto *et al.*, 2004; Raffaelli *et al.*, 1993). Most significantly, activities in which these youth are involved with are performed in absence of adults (Neiva-Silva and Koller, 2002) and often experience emotional, cognitive, social and physical impairments (Alves *et al.*, 2002; Koller and Hutz, 1996; Silva *et al.*, 1998). They also commonly suffer different forms of discrimination further increasing social vulnerability (Hutz and Koller, 1996). This population is therefore vulnerable, facing neglect, abandonment, abuse, and violence (Noto *et al.*, 2004). Finally, the street environment stimulates the occurrence of high-risk behaviors, including drug use and sexual risk with associated susceptibility to HIV and other sexually transmitted infections (STI).

Youth in street circumstances in Brazil are at increased risk of illicit drug use and unsafe sex, sexual violence, and sex exploitation (Forster *et al.*, 1996; Noto *et al.*, 2004) more so than youth sampled from other community settings (Ferri, Gossop, and Laranjeira, 2001; Pechansky, Szobot, and Scivioletto, 2004). A recent study in Brazil (Noto *et al.*, 2004) reported that among children and youth in street circumstances the most commonly reported lifetime drugs were alcohol (76%), tobacco (63%), inhalants (44%), marijuana (40%) and cocaine/crack (24%); up to 88% reported lifetime use of some kind of drug, and 48% report recent use (within one month of interviewing), and 4% report any injection drug use (IDU). In comparison, in Nigeria in a sample of street children, 30% used alcohol, and other drugs commonly described were kolanut (16%), tobacco (14%) and marijuana (10%) (Morakinyo and Odejide, 2003). Children and youth in street circumstances in Bombay reported in focus group discussions the use of drugs as a mechanism to cope with their daily stresses (Kombarakaran, 2004). The high level of drug use reported by Brazilian youth is comparable to that seen in homeless street youth in San Francisco, where between 80 and 99% of homeless street youth report any lifetime history of illicit drug use (Bousman *et al.*, 2005; Gleghorn, Marx, Vittinghoff, and Katz, 1998; Moon, Binson, Page-Shafer, and Diaz 2001) and up to two-thirds report 'recent' use. Street youth in the U.S. are very different however; not only are they older, but lifetime history of IDU is considerably higher (ranging from 32 to 60%) (Clements, Gleghorn, Garcia, Katz, and Marx, 1997; Moon *et al.*, 2001).

Increased sexual risk among Brazilian youth in street circumstances is also described (Hutz and Forster, 1996; Hutz and Koller, 1996; Raffaelli *et al.*, 1993). Many report the use of drugs in order to give them courage to approach potential sexual partners and to avoid pain during anal intercourse with adult men (Raffaelli *et al.*, 1993). In the U.S., drug use in street youth has been associated with unprotected sex (Bailey, Camlin, and Ennett, 1998) and having sex while drunk (Moon *et al.*, 2001). In other countries, such as in

southern Africa and Eastern Europe, street youth report engaging survival sex, that is, sexual intercourse in exchange for money for living expenses or drug purchases, or for drugs themselves (Goodwin, Kozlova, Nizharadze, and Polykova, 2004; Swart-Kruger and Richter, 1997). In Montreal, commercial sex was found to be associated to HIV infection in a street-based population (Roy *et al.*, 2003). In Brazil, risky sexual behavior among this population and its associations with other risks including drug use are a major public and social health concern. While significant data have recently been generated regarding drug exposures in children and youth in street circumstances, there is a paucity of updated data on sexual risk, or the intersection of sexual and drug risk in this population.

This study was undertaken to compile more information on the multiple and intersecting risk factors of sexual and drug use risk in a sample of children and youth in street circumstances in Porto Alegre, Brazil, with the aim of informing interventions that might help reduce vulnerability to HIV and other STI.

Methods

Participants

This study was a cross sectional survey carried out between October 2004 and April 2005. The research was performed in ten centers locally designated as *Service Centers* (Instituições de Serviços) in Porto Alegre, Brazil. Many of these centers are characterized as being "open", not only for many hours per day, but also with respect to other criteria including allowing children and adolescents to come and go at will, and there are no restrictions, such as a requirement to "get out" of the streets in order to participate in the programs offered at the centers. The centers provide food, education, health care, sports, arts activities, and shelter. In Porto Alegre, it is estimated that 450 children and youth ranging from eight to eighteen years of age, in street circumstances are serviced on a yearly basis.

The process of selecting Service Centers for study recruitment went as follows. First, the research staff visited 19 known Service Centers (five listed by the city administration, and 14 known to the research team). Ten were selected as study sites based on having an "open" structure; and the service at that site was dedicated to children and youth in street circumstances. Each center assisted a range of 15–25 children and youth on a daily basis. Centers designated for drug addiction and psychiatric treatments were excluded.

All participants were recruited for study participation at the 10 selected Services Centers. Inclusion criteria for participants (defined as children and youth in street circumstances) were based on the criteria previously used by Neiva-Silva

and Koller (2002): self reported age from 10 to 18; reporting daily street-based activities, including wandering or performing any unskilled job; reporting lack of adult supervision or chaperoning. Children and youth with communication or cognitive disabilities were excluded.

Each selected Service Center was visited daily by the research team for one-week period. All children and youth in street circumstances attending that center during the study period were invited to participate in the study. Names and birth date, and a brief physical description were recorded for each participant and all were asked if they had participated previously. This information was used to reduce the probability of repeat participation in the study. If the interview was not completed in one session, interviewers returned to the center within one week period to finish.

All the potential participants were informed about the study aims and procedures. Those who wished to participate provided verbal consent. As all participants were minors and not in consistent parental custody, parental consent was waived as recommended by the Federal Psychology Board in Brazil (CFP, 2000). Accordingly, designated Service Center staff served as witnesses for the minors who consented to study participation affirmed the informed consent process.

The professional staff at Service Centers includes psychologists and social work professionals trained in providing assistance to these youth. In cases where the interviews led to disclosure of stressful events or physical and psychological problems, participants were referred to assistance primarily to on site staff. Additionally, a cooperative referral system was in place for all participants to other health clinics as needed.

Measures

Five trained interviewers administered structured face-to-face interviews using a 98-item questionnaire. The instrument was adapted from one designed by the World Health Organization (Smart *et al.*, 1981) and used in other Brazilian surveys of youth in street circumstances (Carlini-Cotrim, Silva-Filho, Barbosa, and Carlini, 1989; CEBRID, 1990; Noto *et al.*, 2004; Noto, Nappo, Galduroz, Mattei, and Carlini, 1997; Noto *et al.*, 1998). Adaptations included the addition of new items regarding to sexual behaviors, diagnosed STI and HIV testing and counseling, based on the pre-testing counseling questionnaire, used nationally in Brazil.

The interview included queries on demographics and the context of street life, including age, gender, household information, contact with the family (yes/no), hours in the street on a daily basis (1–2 h, 3–5 h, 6–8 h, >8 h), lifetime years on streets (<2 years, 2–5 years, >5 years), educational information including currently school attendance (yes/no), and highest grade completed. Participants were asked about lifetime (ever) history of sexual intercourse (yes/no), age of

first intercourse, “general” lifetime frequency of condom use (always, sometimes, never), if they had ever exchanged sex for money (yes/no), experienced any kind of sexual abuse in streets (yes/no), any kind of sexual abuse in home (yes/no), and injection drug use (IDU). Behaviors and exposures in the past year included tobacco, alcohol, and illicit drug use (marijuana, inhalants, cocaine/crack or injected; yes/no), number of sexual partners (1–2, 3–10, >10), any diagnosed STI (yes/no), any unprotected sex under influence of drugs or alcohol (yes/no). As well, they were asked if they used condoms during their most recent sexual encounter. HIV-related information included items asking about any HIV testing history (yes/no) and, among those who reported testing, HIV test results (negative, positive, don’t know), any friends with HIV infection (yes/no) and whether the participant believed he/she could get HIV (yes/no/maybe).

Data analysis

Descriptive statistics, including proportions, and frequencies were estimated. Two principal outcomes were selected to indicate drug and sexual risk: history of any illicit drug use in the last year (including marijuana, inhalants, cocaine/crack and injected drugs); and “general” lifetime condom use, coded as ‘consistent’ (always) and ‘inconsistent’ (sometimes or never), among those who reported any history of sexual intercourse. Bivariate and multivariate analyses were conducted to assess associations with the two principal outcomes. Differences in proportions were tested using the chi-squared test or Fisher’s exact where expected cells sizes were small (less than five). Stratified analysis by gender showed some differences by gender (reported in results) but similar associative trends. Thus the authors present bivariate and multivariate analysis combining both genders. Multiple logistic regression analysis was used to identify correlates independently associated with the outcomes of interest. Variables were entered into the model if bivariate p -values were $p \leq .10$ and kept in if $p \leq .05$. The authors made no a-priori categorizations for age between children and youth and stratified analyses were not conducted principally due to considerations of small sample size. However, age as well as gender were included in multivariate analyses to adjust for their potential confounding effects. Interactions between gender and main effects were tested. Logistic models were evaluated using the Hosmer–Lemeshow goodness of fit test.

Results

Of 176 people invited to participate in the study, three (1.7%) were excluded due to inclusion/exclusion criteria, 10 (5.7%) refused, and two (1.1%) did not complete the interview. Table 1 shows selected demographic characteristics, and

Table 1 Demographic characteristics, street life circumstances, drug use and sexual behaviors among children and youth in street circumstances, by gender, in Porto Alegre, Brazil ($N = 161$)

	Total N (%)	Male N (%)	Female N (%)
Demographic characteristics and street life circumstances	161 (100)	128 (79.5)	33 (20.5)
Age (years)			
<14	56 (34.8)	37 (28.9)	19 (57.6)
14–15	34 (21.1)	29 (22.7)	5 (15.2)
>15	71(44.1)	62 (48.4)	9 (27.3)**
Years in streets			
<2	43 (26.7)	30 (23.4)	13 (39.4)
2–5	50 (31.1)	38 (29.7)	12 (36.4)
>5	58 (36.0)	53 (41.4)	5 (15.2)*
Don't remember	10 (6.2)	7 (5.5)	3 (9.1)
Hours in streets (on a daily basis)			
≤ 2	35 (21.7)	26 (20.3)	9 (27.3)
3–5	62 (38.5)	47 (36.7)	15 (45.4)
6–8	30 (18.6)	27 (21.1)	3 (9.1)
>8	34 (21.1)	28 (21.9)	6 (18.2)
Currently attending school	127 (79.4)	97 (76.4)	30 (90.9)
Keeping contact with the family	117 (72.7)	87 (68.0)	30 (90.9)**
Use of tobacco, alcohol and other drugs in the last year			
Tobacco	78 (48.4)	66 (51.6)	12 (36.4)
Alcohol	135 (83.8)	109 (85.2)	26 (78.8)
Marijuana	55 (34.2)	50 (39.1)	5 (15.1)*
Inhalant	51 (31.7)	47 (36.7)	4 (12.1)**
Cocaine/crack	32 (19.9)	29 (22.7)	3 (9.1)
Injected drugs	2 (1.2)	2 (1.6)	0 (0)***
Sexual exposures			
Ever had sex ^a	95 (59.0)	85 (66.4)	10 (30.3)**
Age at first intercourse (years) ^{b,c}			
<10	21 (22.8)	18 (21.9)	3 (30.0)
10–12	29 (31.5)	26 (31.7)	3 (30.0)
>12	42 (45.6)	38 (46.3)	4 (40.0)
Number of sexual partner (last year) ^{b,d}			
0–2	49 (52.7)	41 (49.4)	8 (80.0)
3–10	31 (33.3)	29 (34.9)	2 (20.0)
>10	13 (13.9)	13 (15.6)	–
Use of condom ('general' lifetime) ^b	25 (26.3)	23 (27.1)	2 (20.0)
Use of condom (last sexual intercourse) ^b	69 (72.6)	62 (72.9)	7 (70.0)
Currently have steady partner ^b	53 (55.8)	45 (52.9)	8 (80.0)
Currently have casual partner ^b	79 (83.2)	72 (84.7)	7 (70.0)
Diagnosed STI (last year) ^b	9 (9.5)	8 (9.4)	1 (10.0)
Any unprotected sex under the influence of drugs or alcohol (lifetime) ^b	32 (33.7)	28 (32.9)	4 (40.0)
Ever exchanged sex for money ^b	8 (8.4)	6 (7.1)	2 (20.0)
Ever experienced sexual abuse in streets ^a	17 (10.6)	13 (10.2)	4 (12.1)
Ever experienced sexual abuse at home ^a	8 (5.0)	6 (4.7)	2 (6.1)
HIV testing and related information			
Ever tested for HIV	66 (41.0)	53 (41.4)	13 (39.4)
HIV negative ^e	51 (77.3)	40 (75.5)	11 (84.6)
HIV positive ^e	6 (9.1)	5 (9.4)	1 (7.7)
Doesn't know the result ^e	9 (13.6)	8 (15.1)	1 (7.7)
Have any friends with HIV infection	90 (55.9)	74 (57.8)	16 (48.5)
Believe I will never get HIV	61 (37.9)	46 (35.9)	15 (45.5)

^aAmong the whole sample ($N = 161$)

^bAmong the ones who have ever had sex ($N = 95$)

^cMissing data of three subjects ($N = 92$)

^dTwo subjects said they did not remember how many sex partners they have had

^eAmong the ones who have ever been tested ($N = 66$)

* $p < .05$

** $p < .01$

***Fisher's exact p -value

reported sexual and drug use exposures among the 161 children and youth who participated. Median age overall was 14 years (interquartile range (IQR): 13, 17), and the

majority (79%) were male. Significant differences using chi-squared test were found between male and female participants: boys were significantly older than girls (median age

15 vs. 13, $p < .01$) and spent more years in street ($p < .05$); girls were more likely to report being in contact with their family ($p < .05$) and less likely to report having used marijuana, inhalants and injected drugs in the last year ($p < .05$). Alcohol (in the last year) was the substance most frequently reported among boys and girls, 85 and 79%, respectively. A significantly higher proportion of boys (67%) than girls (30%) reported ever having had sexual intercourse ($p < .01$); but no differences were found between groups for age of sexual debut (median age 12 years, IQR = 10, 14), nor for reported history of condom use in “general” (26%) or during most recent sexual intercourse (72%). Males reported more sexual partners in last year than females (50% vs. 20% reported more than two sexual partners in last year and 15% of males reported more than 10 sexual partners compared to none of the girls). Injection drug use was reported by only two participants (1.2%), both male. Almost half (41%) of the participants reported having been tested for HIV; of those 9.1% reported positive results, and 13% did not know the test result.

Correlates of unsafe sex among children and youth in street circumstances

Table 2 shows bivariate associations with unsafe sex (defined as inconsistent condom use in general) among participants who reported any history of sexual activity ($N = 95$). The odds of having had unsafe sex were significantly higher among those who reported five or more years in the streets compared to those who reported two or less (OR 3.3, 95% CI 1.0–10.7), younger age of sexual debut; less than 10 years old compared to over 12 years old, OR 11.7, 95% CI 1.2–112.4, and reported STI in last year, OR 7.4 approximated by substitution of 0.5 for zero cell. The odds of unsafe sex were increased, but not significantly, among those who reported steady sex partners compared to those who did not report a steady partner, OR 2.4, 95% CI 0.9–6.2, and among those who reported use of inhalants in the last year, OR 2.5, 95% CI 1.0–6.8. No associations were found between reported alcohol, tobacco, marijuana or cocaine use and unsafe sex.

Table 3 shows factors found to be independently associated with unsafe sex in multivariate analysis after controlling for gender. Having a steady sex partner was associated with increased odds, adjusted odds ratio (AOR) 5.2, 95% CI 1.6–16.8 of unsafe sex, as was younger age of sexual debut. Those reporting their first sexual intercourse at less than 10 years of age compared to 12 years or older, were more likely to report unsafe sex, AOR 23.3, 95% CI, 2.5–215.9. No significant interactions were found in these analyses. Reported chronological age was not entered into the model, since age at sexual debut was significant and highly collinear with age in years.

Correlates of any illicit drug use among children and youth in street circumstances

Table 2 shows associations between selected exposures and history of illicit drug use in last year. Participants who were older (≥ 14 vs. < 14 years), male, not currently attending school, not keeping contact with family, had a higher number of years in the streets (> 5 vs. < 2 years), and longer hours in the street on a daily basis (≥ 6 vs. ≤ 2 hours) had significantly higher odds of a history of illicit drug use. Numerous sexual variables were associated with increased odds of illicit drug use including: having ever had sex, the higher numbers of sex partners, inconsistent or no condom use, and reporting having had an STI in last year. Having had an HIV test, perceiving themselves to be at risk of HIV, and having a friend with HIV infection were also significantly associated with increased odds of illicit drug use.

In multivariate analyses (see Table 3), factors independently associated with higher odds of illicit drug use included: not being in contact with family (compared to being in contact), AOR 11.1, 95% CI, 2.6–46.5, $p < .01$, longer hours in the street on a daily basis (≥ 8 vs. ≤ 2 hours; AOR 7.4, 95% CI, 1.5–36.4, $p < .05$), the older age (> 15 vs. < 13 years), AOR 6.4, 95% CI, 1.5–27.8, $p < .01$, and having had an HIV test previously, AOR 4.5, 95% CI, 1.5–13.7, $p < .01$. Although HIV testing was not considered as a risk factor for illicit drug use, it is presented in the model because of the potential relevance for intervention planning. The model without this variable remained similar. No significant interactions were found in these analyses.

Discussion

The principal findings of this study of children and youth in street circumstances, 50% of whom were under 14 years of age, are that a very high proportion report high risk sex and drug exposures. Significantly, sexual exposures have not previously been well described in this vulnerable population. Two thirds of males and one third of females reported having had any sex, and in both groups, sexual debut was under age 12 for over half, and almost half (47%) reported more than three sexual partners in last year. Recent unprotected sex was widely reported (73%), and over one third of boys and girls reported having had unprotected sex under the influence of drugs and alcohol in their lives. Together, these results show significant vulnerability among both males and females for HIV and other STI. Multivariate analysis revealed independent associations between early age of sexual activity and reporting having a steady sexual partner, with the condom use, the indicator of unsafe sex. Both of these exposures are factors that may present potential intervention opportunities in this young group. It is most likely that the association

Table 2 Factors associated with unsafe sex (inconsistent or no condom use in general) and illicit drug use (in the last year) among children and youth in street circumstances in Porto Alegre, Brazil

	Unsafe sex (<i>N</i> = 95) ^a			Illicit drug use in last year (<i>N</i> = 161)		
	<i>N</i> (%)	OR	95% CI	<i>N</i> (%)	OR	95% CI
Demographic characteristics and street life circumstances						
Age (years)						
<14	8 (88.9)	1.0	–	5 (8.9)	1.0	–
14–15	15 (71.4)	0.3	0.03–3.3	11 (32.4)	4.9	1.4–16.7
>15	47 (72.3)	0.3	0.04–2.9	48 (67.6)	21.3	5.8–78.1
Gender						
Male	62 (72.9)	0.7	0.1–3.5	58 (45.3)	3.7	1.4–9.9
Female	8 (80.0)	1.0	–	6 (18.2)	1.0	–
Currently attending school (including “open” school at the Service Center)						
Yes	45 (70.3)	1.8	0.6–5.0	36 (28.3)	1.0	–
No	25 (80.6)	1.0	–	28 (84.8)	14.2	4.4–45.3
Keeping contact with family						
Yes	35 (67.3)	2.1	0.8–5.7	23 (19.6)	1.0	–
No	35 (81.4)	1.0	–	41 (93.2)	55.8	10.2–305.3
Years on the streets						
<2	9 (52.9)	1.0	–	6 (13.9)	1.0	–
2–5	17 (77.3)	3.0	0.7–12.8	12 (24.0)	1.9	0.6–5.8
>5	44 (78.6)	3.3	1.0–10.7	46 (67.6)	12.9	4.0–42.0
Hours in the street (daily)						
1–2	11 (78.6)	1.0	–	5 (14.3)	1.0	–
3–5	22 (68.7)	0.6	0.13–2.7	18 (29.0)	2.5	0.8–7.5
6–8	12 (66.7)	0.5	0.10–2.8	13 (43.3)	4.6	1.3–16.3
>8	25 (80.6)	1.1	0.23–5.5	28 (82.4)	28.0	4.7–166.1
Sexual exposures						
Ever had sex						
Yes	–	–	–	58 (60.4)	15.0	5.0–44.7
No	–	–	–	6 (9.2)	1.0	–
Age of the first intercourse (years)						
<10	19 (95.0)	11.7	1.2–112.4	12 (57.4)	0.9	0.3–2.6
10–12	23 (79.3)	2.4	0.8–7.2	20 (68.9)	1.5	0.6–4.2
>12	26 (61.9)	1.0	–	25 (59.5)	1.0	–
Number of sexual partners (last year)						
None	5 (55.6)	1.0	0.4–7.1	11 (14.7)	1.0	–
1–2	26 (66.7)	1.6	0.6–13.8	21 (53.9)	6.8	2.5–18.3
3–10	24 (77.4)	2.7	0.6–150.7	16 (51.6)	6.2	2.2–17.5
>10	12 (92.3)	9.6	–	13 (100)	151.3^a	–
Unsafe sex (inconsistent condom use) (ever)						
Yes	–	–	–	46 (65.7)	7.7	3.4–17.2
No	–	–	–	18 (20.0)	1.0	–
Currently have steady partner						
Yes	43 (81.1)	2.4	0.9–6.2	37 (69.8)	2.3	1.0–5.5
No	27 (64.3)	1.0	–	21 (50.0)	1.0	–
Currently have casual partner						
Yes	59 (74.7)	1.3	0.4–4.4	51 (64.6)	2.3	0.8–7.1
No	11 (68.7)	1.0	–	7 (43.7)	1.0	–
Reported STI (last year)						
Yes	9 (100)	7.4^b	–	9 (100)	13.6^b	–
No	61 (70.9)	1.0	–	49 (57.0)	1.0	–
Ever experienced sexual abuse in street						
Yes	11 (78.6)	1.4	0.4–5.4	7 (41.2)	1.1	0.4–3.0
No	59 (72.8)	1.0	–	57 (39.6)	1.0	–
Ever experienced sexual abuse at home						
Yes	4 (66.7)	0.7	0.1–4.1	2 (25.0)	0.5	0.1–2.5
No	66 (74.2)	1.0	–	62 (40.5)	1.0	–

Table 2 Continued

	Unsafe sex ($N = 95$) ^a			Illicit drug use in last year ($N = 161$)		
	N (%)	OR	95% CI	N (%)	OR	95% CI
Ever exchanged sex for money						
Yes	4 (57.1)	0.4	0.1–2.2	5 (62.5)	2.7	0.6–11.7
No	66 (75.0)	1.0	–	59 (38.6)	1.0	–
HIV-testing and related information						
Ever tested for HIV						
Yes	40 (74.0)	1.1	0.4–2.6	47 (71.2)	11.4	4.7–27.6
No	30 (73.2)	1.0	–	17 (17.9)	1.0	–
HIV test result						
Negative	32 (74.4)	1.0	–	35 (68.6)	1.0	–
Positive	3 (60.0)	0.5	0.1–3.6	5 (83.3)	2.3	0.2–21.9
Don't know	5 (83.3)	1.7	0.2–16.8	7 (77.8)	1.6	0.4–8.7
Believe self to be at risk for HIV						
Yes	47 (74.6)	1.4	0.5–4.0	40 (48.8)	2.5	1.2–5.1
Maybe	8 (80.0)	1.9	0.3–11.7	7 (38.9)	1.7	0.5–5.0
No	15 (68.2)	1.0	–	17 (27.9)	1.0	–
Having friends with HIV						
Yes	55 (77.5)	2.1	0.8–5.7	53 (58.9)	7.8	3.3–18.4
No	15 (62.5)	1.0	–	11 (15.5)	1.0	–

Note. Unsafe sex, N (%): Yes, 70 (73.7%); No, 25 (26.3%). Illicit drug use in last year, N (%): Yes, 64 (39.7%); No, 97 (60.3%)

^aAnalyses restricted to those who reported ever having had sex

^bOdds ratio approximated by substitution of 0.5 for zero cell

between lack of condom use and having a steady partner is a reflection of general belief that in a relationship involving love or emotional commitment, sex is less risky (Antunes, Peres, Paiva, Stall, and Hearst, 2002; Silva, 2002). In fact, trust is often propagated through the acts of having unprotected sex (Silveira, Béria, Horta, and Tomasi, 2002). We did not query participants as to how long they had been in a steady relationship, but it is possible that many had serial 'steady' relationships, or even concurrent partnerships based on the high numbers of partners reported. Two thirds of those sexually active reported steady sexual partners and almost all of them reported casual partners currently. Both HIV and STI risk is increased among people who have multiple partners, including both steady and casual relationships. Interventions to increase condom use with all partners, through better condom negotiation skills, more access to condoms, and alternatives, such as female condoms should be implemented directly as means of reducing sexual risk. As well, interventions that encourage delaying sexual activity are also needed. Noting that almost half of children and youth in this sample reported HIV testing, these interventions should also be considered in the context of pre- and post-test counseling.

Street youth are likely to have engaged in earlier sexual intercourse than adolescents in general (Walters, 1999). Early initiation of sexual activity was identified as a strong risk factor for unsafe sex in this sample. Other researchers have shown that early age of sexual debut (11

years) is associated with coercion, in particular among girls (Raffaelli *et al.*, 1993), which is also recognized to be associated with increased sexual risk and HIV infection (Molitor, Ruiz, McFarland, and Klausner, 2000). While our study did not investigate circumstances of first sexual experiences, our results demonstrate the highly vulnerable situation of children and youth in street circumstances, and a need for explicit sexual risk reduction.

Drug use, which has received considerably more attention among children and youth in street circumstances (Bousman *et al.*, 2005; Dominguez, Romero, and Paul, 2000; Forster *et al.*, 1996; Gleghorn *et al.*, 1998; Noto *et al.*, 2004) was also prevalent in our sample. Alcohol was the substance reported by a majority of participants (83%). The prevalence of other non-injected drugs was considerably less than alcohol, including tobacco, inhalants, crack, cocaine and marijuana, and IDU was almost nil. HIV and AIDS surveillance shows that HIV infection in Porto Alegre is highly driven by IDU (Brazil Ministry of Health, 2005), thus the low prevalence of this exposure among children and youth in street circumstances demonstrates an especially significant window of opportunity for interventions and strategies to maintain continued avoidance and diversion from IDU among this population. Finally, a third of these children and youth reported having had unprotected sex under the influence of drugs or alcohol, showing that the prevention strategies need to consider these important coupled risks.

Table 3 Multivariate analysis: independent associated variables for unsafe sex (inconsistent or no condom use in general) and illicit drug use (last year)

Variable	Adjusted odds ratio	95% CI
Unsafe sex ($N = 91$) ^a		
Age of the first intercourse (years)		
>12	1.00	–
10–12	3.9	1.1–13.4*
<10	23.3	2.5–215.9**
Currently have steady sex partner (yes/no)	5.2	1.6–16.8**
Gender		
Female	1.0	–
Male	1.4	0.2–8.0
Illicit drug use in last year ($N = 161$) ^b		
Not keeping contact with family	11.1	2.6–46.5**
Hours in street (on a daily basis)		
1–2	1.0	–
3–5	0.9	0.2–4.0
6–8	2.0	0.4–9.5
>8	7.4	1.5–36.4*
Ever tested for HIV	4.5	1.5–13.7**
Age (years)		
<13	1.0	–
13–15	2.3	0.5–10.8
>15	6.4	1.5–27.8**
Gender		
Female	1.0	–
Male	3.5	0.8–15.5

^aHosmer–Lemeshow goodness of fit $p = .53$

^bHosmer–Lemeshow goodness of fit $p = .9$

* $p < .05$

** $p < .01$

Variables found to be independently associated with a history of illicit drug use included lack of familial contact and increased time on the street. Others have reported associations between lack of familial relationship and high risk behavior in studies of at risk youth in other locations (Clements *et al.*, 1997; Forster *et al.*, 1996; Moon *et al.*, 2001; Morakinyo and Odejide, 2003) and suggested that healthcare providers might identify higher risk youth and children by asking simple questions regarding family support. Those who cannot go back to family should have more targeted intervention. Further, we propose that a wider range of housing should be explored, including housing with social and familial support as potential interventions for youth and children in street circumstances. The increased odds of drug use associated with time on the street are of special interest. Although we did not observe an independent significant dose response relationship, likely due to the small sample size, there was a positive trend seen with increasing daily street exposure. This finding is especially important to consider both for the continued support of existing Service Centers and in the designing and

implementation of other public health interventions for this population. Children and youth have developmental needs, which ideally involve a familial structure, with adult supervision and guidance. The Service Centers in Porto Alegre are an important alternative environment to the streets. In addition to educational, social and health services, these centers can also play an important role on trying to rebuild familial relationships.

The association between reporting having had an HIV test and exposure to illicit drugs is likely a reflection of the services to which our population had access to. The Service Centers at which children and youth were recruited offer considerable interaction with health professionals; many may have been counseled to get HIV tested or even tested on site. Interestingly, HIV testing was not associated with unsafe sex. In the service center setting, it is possible that testing is more likely to be prescribed, as the effects of drug and alcohol use are more visible. Health professionals should be aware that a high proportion of children and youth have had unsafe sexual exposures, and expand this important service accordingly.

We recognize some limitations of our study. Although efforts were made to discourage duplicate interviews, this population may have been ‘street-wise’ enough to take advantage of the multiple opportunities to participate in the study given the number of centers and interviewers. Socially acceptable answers and low reported exposure to illicit activities and sensitive personal information are known to be a potential source of bias in face-to-face interviews. The low proportion of respondents who reported sexual abuse, or sex trade may be indicative of this effect. We attempted to reduce underreporting by the use of trained interviewers who were not part of the staff of the Services Centers and who spent time in trust building activities before conducting interviews. Future studies may want to consider testing and validating other interviewing methods such as audio assisted computer technology to reduce potential underreporting (including potential differential reporting by males) in this population. Overall, we note that reporting bias of this sort generally results in conservative associations of excess risk. The sample size is small, and a relatively small proportion of girls were interviewed, however other research suggests that the ratio of males to females seen in this sample is consistent with that seen in larger samples and ‘on the street’ (Forster *et al.*, 1996; Raffaelli *et al.*, 1993). Generalizability may have also been compromised by bias associated with the sampling venue; participants who had access to services may be more likely to underreport exposures, again possibly leading to an underestimate of associated risk. Finally, the cross-sectional design prevents cause-effect analysis and cohort studies with this population are highly needed.

Despite these limitations, this study provides important and helpful information about children and youth in street

circumstances that can be used immediately to help in the design and implementation of targeted interventions. In Porto Alegre, where this research was carried out, being “in the street” has been decriminalized, with focus and resources instead being directed toward service provision including education and prevention. The Service Centers, where this research was collaboratively carried out, offer a unique opportunity for this to occur more systematically in vulnerable children. Programs may be expanded by aiming at identifying and reducing sexual risk, accessing educational resources, improving familial relations, treating and preventing drug abuse, including IDU, and promoting further overall harm reduction. Service Centers’ staff should be systematically trained on drug abuse and risk sexual behaviors-related managing skills. Furthermore, in Brazil, drug abuse treatment institutions specialized in children and adolescents’ assistance, including children and youth in street circumstances, are in great need.

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