

Predicting condom use in young women: demographics, behaviours and knowledge from a population-based sample in Brazil

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Summary: The goal of this study was to assess condom use and related behaviour in young women in Vitória, Brazil. From March to December 2006, a cross-sectional sample of women aged 18–29 years was recruited into a population-based study. Risk behaviours for HIV and sexually transmitted infections (STIs) were surveyed. Condom use at last intercourse was assessed as a principal outcome describing protective sexual behaviour. Of 1200 eligible women identified, 1029 (85.8%) enrolled. Among them, 904 (87.9%) reported a history of sexual activity. Only 36.6% reported condom use at last intercourse; those who did were more likely to report commercial sex work (odds ratio [OR] 9.01 [1.46–55.55]), to state that STI prevention was a primary reason for using condoms (OR = 6.84 [4.81–9.71]), to have been previously diagnosed with an STI (OR = 2.39 [1.36–4.21]), to report that ‘it is easy to tell a sexual partner they will not have vaginal/anal sex without a condom’ (OR = 2.30 [1.56–3.39]), to report that sexual intercourse is only risky when people have anal sex (OR = 1.98 [1.22–3.22]); and less likely to be married (OR = 0.65 [0.54–0.78]), and to find it difficult to use condom consistently in all sexual encounters (OR = 0.36 [0.25–0.52]). Women who reported condom use were more concerned with preventing STIs, and to report less difficulty insisting on condom use with partners.

Keywords: condom use, sexual behaviour, HIV/STI, young women, Brazil

INTRODUCTION

Condom use remains the most important strategy to prevent sexually transmitted HIV and other sexually transmitted infections (STIs).^{1–3} However, sexual behaviour is diverse and deeply embedded in individual desires, social and cultural relationships, and environmental and economic processes.^{4,5} This makes HIV prevention a complex undertaking with multiple dimensions that requires both policy and programmatic actions guided by representative data from the target population.⁵

Condom promotion has been a backbone of the prevention efforts in Brazil, especially among young people and women in particular. Social marketing in nationwide campaigns reflects this: the 2008 carnival campaign’s slogan was ‘Be good in bed, use a condom’; 100,000 temporary tattoos were created and distributed with the words ‘I’ve got attitude. I use condoms’. The campaign reinforced the strategy of the 2007 World AIDS Day campaign, which encouraged young women to ensure that their sexual partners always use condoms. In 2008, the Brazilian Ministry of Health (MoH) provided 19.5 million condoms to states and municipalities for free distribution, further reinforcing their commitment to sexual risk

reduction and prevention.⁶ Such campaigns are typical of Brazil’s overall approach to HIV prevention, which is sex positive with condom promotion at its heart.

Young women were the targets of the 2008 carnival campaign because HIV disproportionately affects women in the younger age groups: for every six teenage (age 13–19 years) boys with AIDS there are 10 teenage girls with an AIDS diagnosis.⁷ Behavioural surveillance conducted by the Brazilian Ministry of Health shows that young people between 15 and 24 years of age report more casual sexual partners than people in older age groups.⁸ The same data found that 87% of males aged 16–19 years reported condom use when having casual sex, compared with 42% of their female counterparts in the same situation.⁸

The identification of condom usage patterns in women from the general population can foster the development of condom education and promotion programmes and appropriate group targeting. The goal of this study was to describe condom use and characterize attitudes and behaviours associated with condom use at last intercourse in a population-based sample of young adult women in Vitória, Brazil.

METHODS

General study design

This study was a part of a project designed to measure the prevalence of HIV, syphilis, markers of hepatitis B and hepatitis

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C infections and related risk behaviour in young adult women (aged 18–29 years) in Vitória, Brazil. In this article, we assess condom use and sexual behaviour, and describe attitudes and behaviour patterns relating to condom use among sexually active young women. We conducted a single-stage, population-based, door-to-door, cross-sectional survey. Details on the methods have been previously published, as well as the prevalence of HIV and other STIs in this group.⁹

Sampling design and subject recruitment

The target population was young adult women aged 18–29 years, residing in Vitória, Brazil. The Municipal Health Department of Vitória is divided administratively into six regions. Of these regions, health region I, II and VI were selected as the target area because the Family Health Program (FHP) in this area had previously enumerated the population for implementation of public primary health-care programmes. The three regions were defined by 2000 census data, which have median-high, median and median-low household income, respectively. In this target area, the total population is 117,056, of whom 10,660 (9.1%) are women aged 18–29 years.

We planned our sample design to include eligible women proportional to their population size in the three regions: 30.7% for region I, 51.0% for region II and 18.3% for region VI. The sample was therefore self-weighting with respect to the number of eligible women in the three regions. All women sampled who met the eligibility criteria were invited to participate. To weight the sample according to the relative proportion of eligible women in the three regions, the enrolment goals were 368 women from region I, 612 from region II and 220 from region VI. The number of households targeted for contact took into account an 80% participation rate. Sampled households with eligible women were selected by simple random sampling from the FHP census available for each target area.

Study recruitment occurred by door-to-door contact. Community health outreach workers (CHOWs) visited the selected household and invited eligible women to participate in the project. Eligibility criteria included female gender, aged 18–29 years and residency in the targeted health regions in Vitória, Brazil. 'Residency' was defined as staying at a dwelling during the previous six months and having no other home. CHOWs made at least six attempts to contact a resident of each dwelling. Study eligibility was established through a face-to-face interview. Eligible women were invited to participate and be enrolled immediately, or later at an alternatively arranged date and/or location. Recruitment occurred from March to December 2006.

Consent process and documentation

The ethics committees from the Federal University of Espírito Santo and from the University of California, San Francisco approved the protocol for the study. Written informed consent was obtained before participation in any activity of the study. All women with diagnosed infections were offered counselling and treatment according to the Brazilian National Guidelines for STIs and referrals to care as necessary or requested.

Study measures

A 30-minute face-to-face interview was conducted with the use of a standardized questionnaire by trained field staff from the local health department. The risk assessment questionnaire

included questions on participant's sociodemographic characteristics (age, schooling, marital status, monthly income, living situation, employment and health-care assistance), exposure and behaviours (currently smoking, alcohol use, illicit drug, injection drug use, number of partners, previous STIs and commercial sexual workers), and knowledge, attitudes and strategies used to prevent STIs and HIV.

Methods of data analysis

Standard descriptive statistical analyses were performed, including frequency distributions for categorical variables and medians and interquartile ranges (IQR) or means and standard deviations for continuous variables with non-normal and normal distributions, respectively. Prevalence and 95% confidence intervals (CIs) were estimated based on a binomial distribution. Odds ratios (ORs) and 95% CIs were calculated in bivariate analyses and adjusted ORs in multivariate logistic regression analyses.

To assess variables independently associated with the primary outcome of interest, condom use at last intercourse, a two-phase analytic approach was conceptualized to guide variable inclusion based on *a priori* hypotheses. First, four groups of variables assessing different domains were assessed in association with the outcome: group 1, demographic and behavioural variables (for instance, age, marital status and number of sexual partners, commercial sex work [CSW] and drug use); group 2 and 3, mediating variables, including knowledge of HIV and STIs (group 2), and attitudes and self-efficacy towards condom use (group 3); and group 4, STI and HIV prevention strategies. Stepwise multivariate analyses were performed with each separate group and variables associated with condom use at last intercourse were selected to enter a final multivariate model. The final model was built using stepwise logistic regression with $P < 0.15$ as the critical value for variable entry and $P \geq 0.10$ as the criteria for variable elimination.

RESULTS

Within contacted dwellings, 1200 eligible women were identified and 1029 enrolled (85.8%). A total of 904 (88.0%) reported any history of sexual activity. No significant sociodemographic differences were found between women who were not sexually active compared with those who reported any history of sexual activity (data not shown). Just over one-third (36.6% [95% confidence interval (CI) 33.5–39.7]) of sexually active young women reported condom use at last intercourse.

The median age of participants included in the analysis was 23 (IQR 20–26) years and 42.7% were married or living with their partners. Median monthly family income was US\$310 (IQR US\$174–US\$652). A total of 557 (61.6%) reported previous pregnancy and 312 (34.5%) reported knowing someone with HIV/AIDS. Almost two-thirds (62.8%) had been previously tested for HIV.

Table 1 shows associations between demographic and self-reported behaviours (group 1) and condom use at last intercourse. In bivariate analyses, condom at last intercourse was associated with younger age (39.3% of those ≤ 24 compared with 32.0% of those > 24 years), marital status (48.9% and 43.8% of single and divorced/widowed women compared with 22.1% of married women) and reporting seeking health care in the last six months (34% versus 42.6% who did not seek care). Risk behaviours bivariately associated with

Table 1 Demographic and selected behaviour characteristics in young women (aged 18–29 years) attending a Family Health Program in Vitória, Brazil, and reported condom use at last intercourse among 904 sexually active women (2006)

Demographic characteristics	Total <i>n</i> (%)	Condom use at last intercourse		
		Yes <i>n</i> (%)	OR (95% CI)	Adjusted OR (95% CI)
Age (years)				
18–24	557 (61.6)	219 (39.3)	1.4 (1.04–1.83)*	1.1 (0.83–1.58)
25–29	347 (38.4)	111 (32.0)	1	1
Years of education				
Up to 4 years	65 (7.2)	19 (29.2)	1	1
≥ 5	839 (92.8)	311 (37.1)	1.4 (0.82–2.50)	1.1 (0.59–1.58)
Marital status				
Single	460 (50.9)	225 (48.9)	3.4 (2.55–4.62)*	3.1 (2.16–4.36)*
Divorced/widow	32 (3.5)	14 (43.7)	2.8 (1.33–5.79)*	2.6 (1.19–5.70)*
Married/living together	412 (45.6)	91 (22.1)	1	1
Monthly income[†]				
≤ 4 monthly wages	615 (68.0)	225 (36.6)	1.0 (0.76–1.32)	0.9 (0.66–1.23)
> 4 monthly wages	289 (32.0)	105 (36.3)	1	1
Living				
Alone	58 (6.4)	28 (48.3)	1.4 (0.65–3.33)	1.1 (0.46–2.87)
Friends	37 (4.1)	21 (56.8)	0.4 (0.20–0.74)*	0.7 (0.36–1.58)
Family/husband	809 (89.5)	281 (34.5)	1	1
Employment				
Informal	102 (11.3)	33 (32.4)	0.8 (0.51–1.28)	0.9 (0.72–1.36)
Formal (part- or full-time)	412 (45.6)	152 (36.9)	1.0 (0.74–1.32)	0.8 (0.46–1.29)
Not employed	390 (43.1)	145 (37.2)	1	1
Seeking health care	647 (71.6)	220 (34.0)	0.7 (0.51–0.93)	0.6 (0.47–1.08)
Selected behaviours				
Currently smoking	158 (17.5)	53 (33.5)	0.9 (0.59–1.23)	0.7 (0.46–1.08)
Alcohol use				
None	245 (27.1)	98 (40.0)	1	1
Mild	311 (34.4)	118 (37.9)	0.9 (0.65–1.29)	0.7 (0.47–1.02)
Heavy	69 (7.6)	32 (46.4)	1.3 (0.76–2.22)	1.1 (0.60–2.14)
Did not answer	279 (30.9)	82 (29.4)	0.6 (0.43–0.90)*	0.8 (0.61–1.29)
Any illicit drug use	163 (18.0)	53 (32.5)	0.8 (0.56–1.16)	0.7 (0.44–1.04)
Injection drug use	5 (0.6)	2 (40.0)	0.8 (0.14–5.26)	0.2 (0.01–1.87)
Number of sexual partners				
Had more than one partner in the last six months	141 (15.6)	72 (51.1)	2.0 (1.42–2.93)**	1.3 (0.87–2.02)
Had more than one partner in lifetime	609 (67.4)	227 (37.3)	1.1 (0.83–1.48)	1.1 (0.76–1.48)
Had been previously diagnosed with an STI	109 (12.1)	32 (29.4)	1.4 (0.93–2.22)	2.0 (1.22–2.26)*
Commercial sex worker	12 (1.3)	10 (83.3)	9.1 (1.95–41.67)**	21.7 (2.26–62.34)**

STI = sexually transmitted infection; OR = odds ratio; CI = confidence interval

* $P < 0.5$; ** $P < 0.01$ [†]One Brazilian monthly wage = US\$159

condom use at last intercourse included reported alcohol use (women who refused to answer this question were less likely to report condom use), multiple sexual partners and CSW. In multivariate analyses, marital status, previous STI and history of CSW remained associated with condom use at last intercourse (Table 1).

Few women (3.7%) perceived themselves to be at risk of HIV. Table 2 shows the proportion of women agreeing with questions assessing HIV and STI knowledge, attitudes, and self-efficacy measures (variable groups 2 and 3) and associations with condom use at last intercourse. Women who agreed that 'sexual intercourse is only risky when people have anal sex' and that 'if infected with HIV, there's a good chance there would be a cure for AIDS before getting sick' were significantly more and less likely, respectively, to report condom use at last intercourse in bivariate and multivariate analyses (group 2). Women who agreed 'it is easy for me to tell a sexual partner I will not have vaginal/anal sex without a condom' were more likely to report condom use. Overall, 67.6% of the sample reported that it was easy for them to tell a partner, and of 42.9% of those agreeing reported using a condom compared with 23.5% of those not agreeing. Women were less likely to report condom use at last sex if they agreed that 'I find it

difficult to use a condom consistently', 'that condom use is unsatisfying' and if her partner did not want to use a condom 'there is little I can do about it'.

Women were queried regarding a range of STI prevention strategies they used including oral sex, urination after sex, male and female condom use, partner selection strategies, frequency of sex and hygiene-related questions (Table 3). In bivariate analyses, women were less likely to report condom use at last intercourse if they agreed that avoiding new partners was a strategy they used compared with women who did not report using this strategy (32.8% compared with 43.7%, respectively), and if they used spermicides to prevent STIs (15.4% compared with 37.3% who did not agree that they used this strategy). Women who agreed with the strategy of using male condoms to prevent STIs were significantly more likely to report condom use at last intercourse in both bivariate and multivariate analyses.

Table 4 shows factors found to be independently associated with condom at last intercourse in the final model. The sociodemographic variables predictive reporting condom use at last intercourse included marital status (married women were significantly less likely to report condom use), having been diagnosed previously with an STI and reporting being a

Table 2 HIV/STI knowledge, attitudes and prevention self-efficacy by reported condom use at last intercourse among 904 sexually active young women attending a Family Health Program in Vitória, Brazil (2006)

Knowledge relating to HIV/STIs	Agreed with statement n (%)	Condom use at last intercourse		Adjusted OR (95% CI)
		n (%)	OR (95% CI)	
Sexual intercourse is only risky when people have vaginal sex	145 (16.0)	51 (35.2)	0.9 (0.64–1.35)	0.7 (0.46–1.05)
Sexual intercourse is only risky when people have anal sex	185 (20.5)	91 (49.2)	1.9 (1.40–2.70)**	2.3 (1.57–3.29)**
HIV-positive persons on protease inhibitors or the new combination drugs are less likely to transmit HIV	178 (19.7)	63 (35.4)	0.9 (0.67–1.33)	0.9 (0.60–1.26)
If I got infected with HIV today there is a good chance there would be a cure for AIDS before I would ever get sick	207 (22.9)	61 (29.5)	0.7 (0.48–0.93)*	0.7 (0.47–1.00)
If I got exposed to HIV today I would be able to take an AIDS drug to avoid the infection	296 (32.7)	104 (35.1)	0.9 (0.69–1.22)	0.9 (0.69–1.31)
Attitudes and self-efficacy				
It is easy for me to tell a sexual partner I will not have vaginal/anal sex without a condom	611 (67.6)	262 (42.9)	2.5 (1.81–3.40)**	2.1 (1.50–2.91)**
I find it difficult to use condoms consistently in all sexual encounters	473 (52.3)	110 (23.3)	0.3 (0.23–0.39)**	0.4 (0.27–0.50)**
Using a condom is unsatisfying	316 (35.0)	72 (22.8)	0.4 (0.28–0.51)**	0.6 (0.45–0.89)**
If someone I'm having sex with does not want to use a condom, there is little I can do about it	327 (36.2)	88 (26.9)	0.5 (0.40–0.68)**	0.6 (0.45–0.85)**

OR = odds ratio; CI = confidence interval
* $P < 0.5$; ** $P < 0.01$

commercial sex worker. With respect to knowledge, women who agreed 'sexual intercourse is only risky when people have anal sex' were more likely to report condom use at last intercourse. Variables in group 3, measuring attitudes and self-efficacy independently associated with condom use at last intercourse included agreeing that 'it is easy to tell a sexual partner to not have vaginal/anal sex without a condom', and that they found it 'difficult to use a condom consistently in all sexual encounters'. Aside from engaging in CSW, the strongest independent association found with condom use was among women who agreed with using male condoms to prevent STIs (adjusted odds ratio [AOR] 6.84; 95% CI 4.81–9.71).

DISCUSSION

Condom use at last sexual intercourse was infrequent (36.6%) in this population-based study among young women in Vitória, Brazil. Measures of condom use have been variable in Brazil,

depending on age, relationship status and socioeconomic level. For example, a previous study in Vitória found a higher proportion (53.8%) reporting condom use at last intercourse in a population-based sample of female adolescents (aged 15–19 years)¹⁰; however, the target age was younger. Despite the emphasis Brazil places on condom use for primary HIV prevention, most other studies in Brazil have reported low rates of condom use among young people.^{11,12} Silveira *et al.*¹³ reported a lower general rate of 28.0% in a population-based study performed among women (aged 15–49 years) in the south of Brazil, but condom use was more frequent when they considered young women. The most recent sexual behaviour study done by the MoH showed that although 93.6% of young women reported that condom is one of the best methods for AIDS prevention, only 38.4% reported condom use at last sexual intercourse.⁸ A Brazilian national population-based study showed 21.0% condom use during the previous year among sexually active women aged 16–65 years old.

Table 3 Strategies used for preventing STIs among young women by reported condom use at last intercourse among 904 sexually active young women attending a Family Health Program in Vitória, Brazil (2006)

Strategies used to prevent STIs	Agreed with statement n (%)	Condom use at last intercourse		Adjusted OR (95% CI)
		n (%)	OR (95% CI)	
Only oral sex to prevent STIs	16 (1.8)	5 (31.3)	0.8 (0.27–2.29)	1.0 (0.27–3.40)
Have purposefully urinated after sex to prevent STIs	123 (13.6)	51 (41.5)	1.3 (0.87–1.88)	1.4 (0.88–2.31)
Used more male condoms for preventing STIs	152 (16.8)	230 (64.1)	7.9 (5.84–10.77)**	8.4 (6.10–11.63)**
Used more female condoms for preventing STIs	14 (1.5)	6 (42.9)	1.3 (0.45–3.80)	1.2 (0.35–4.28)
Used spermicidal film, foam or suppositories to prevent STIs	26 (2.9)	4 (15.4)	0.3 (0.11–0.90)*	0.4 (0.12–1.34)
Had sex with partners you knew	408 (45.1)	136 (33.3)	0.8 (0.59–1.02)	0.7 (0.50–1.08)
Asked partners about their other partners	271 (30.0)	98 (36.2)	1.0 (0.73–1.32)	1.0 (0.67–1.58)
Had sex less often	236 (26.1)	94 (39.8)	1.2 (0.89–1.64)	1.0 (0.72–1.53)
Avoided new partners for preventing STIs	597 (66.0)	196 (32.8)	0.6 (0.47–0.83)**	0.5 (0.36–0.75)*
Asked partners about STIs	277 (30.6)	101 (36.5)	1.0 (0.74–1.34)	0.8 (0.53–1.28)
Washed vagina/penis/anus after sex	224 (24.8)	77 (34.4)	0.9 (0.64–1.21)	0.7 (0.45–1.12)
Checked for sores, lesions on partner	215 (23.8)	80 (37.2)	1.0 (0.76–1.43)	1.4 (0.90–2.14)

STI = sexually transmitted infection; OR = odds ratio; CI = confidence interval
* $P < 0.5$; ** $P < 0.01$

Table 4 Multivariate analysis of independent factors associated with condom use at last intercourse among 904 sexually active young women attending a Family Health Program in Vitória, Brazil (2006)

Factors	Adjusted OR	95% CI	P value
Marital status (married or living together with a partner versus other)	0.65	0.54–0.78	0.000
Previously diagnosed with an STI (yes versus no)	2.39	1.36–4.21	0.002
Commercial sex worker (yes versus no)	9.01	1.46–55.55	0.018
Sexual intercourse is only risky when people have anal sex	1.98	1.22–3.22	0.006
It is easy for me to tell a sexual partner I will not have vaginal/anal sex without a condom (yes versus no)	2.30	1.56–3.39	0.000
I find it difficult to use condoms consistently in all sexual encounters (yes versus no)	0.36	0.25–0.52	0.000
Used more male condoms for preventing STIs (yes versus no)	6.84	4.81–9.71	0.000

STI = sexually transmitted infection; OR = odds ratio; CI = confidence interval

In the 16–25 years old group, the rate was 35% and the group that least used condoms was women in stable relationships.¹⁴ These last data are confirmed in the present study, with greater condom use at last sexual intercourse among non-married women. Although HIV incidence in women with primary schooling (1st–8th grades) in Brazil is higher than among those with secondary education (9th–11th grades),¹¹ in this study, we did not find any association between condom use at last intercourse and schooling or monthly income. Silveira *et al.*¹³ found a positive association of condom use and schooling but not with income.

Several other factors associated with condom use merit attention in this study: young women were more likely to use a condom when they thought it was easy to tell a sexual partner to not have vaginal/anal sex without a condom, when they thought that sexual intercourse was only risky when people have anal sex, when they had decided to use condoms more for preventing STIs, when they had more than one partner in last six months, and when they reported a previous STI. The finding of using condoms more often for STI prevention rather than contraception suggests a link to the specific STI/AIDS campaigns and education strategies developed by FHP. Women with previous STIs may have used condoms at last intercourse more often because they received counselling and condoms in the FHP when diagnosed with an STI.

Our findings also reinforce the need for education and intervention programmes to pay special attention to issues related to negotiation of condom use for women and also to communication skills in general.^{4,15} Other studies have shown the importance of implementing programmes aimed at preventing transmission of HIV/STIs in young women focusing on behaviour change and empowering women to negotiate condom use with their partners.^{16–19} These interventions are not easily implemented because women need societal empowerment in order to be more able to negotiate condom use.

This population-based study provides information about key knowledge and behaviours related to HIV prevention risks in this population. Women frequently reported a previous HIV test, probably related to a high rate of HIV antenatal testing and specific high-profile media campaigns encouraging testing throughout Brazil. It was also interesting to note that a

substantial number of young women knew someone who was HIV infected, suggesting that widespread treatment programmes in Brazil have demystified HIV and/or more people feel comfortable to disclose that they are HIV infected.¹¹ Nonetheless, it is necessary for further studies to clarify and to confirm these hypotheses.

Limitations of the present study include the cross-sectional design precluding inferences on cause-effect and the modest sample size. However, our response rate was high, and the population basis of the data is highly relevant and generalizable to women in the metropolitan area of Vitória. Nevertheless, the Brazilian population is highly heterogeneous, and inferences from this study may be limited with respect to women attending private health care and/or from other parts of the country. The possibility of response bias, owing to the tendency to provide socially acceptable answers, cannot be excluded. We suggest that such biases would result in under-estimation of risky attitudes and behaviours. Inaccuracies of recall of condom use, age of first intercourse and number of sexual partners also may have occurred.

Some recent setbacks in the search for new preventive technologies, such as HIV vaccines and microbicides, highlight the fact that condom use will remain the key preventive tool for many years to come. Condoms are a key component of comprehensive prevention strategies individuals can choose at different times in their lives to reduce their risks of sexual exposure to HIV and other STIs. The findings from this study have important implications for education and prevention efforts directed towards young women at risk of HIV/STIs. The fact that more than 60% of participants reported not using condoms at last intercourse can be taken as a predictor of future sexual risk-taking and highlights the need for education efforts to target young adolescents before they become sexually active. Information should be provided in a language both familiar and appropriate to each group of people and in settings that are comfortable for them. A comprehensive approach would promote sexual responsibility and, at the same time, improve young women's understanding of sexual health risks and provide them with necessary behavioural and communication skills. Finally, our study emphasizes the importance of true population-based data to correctly and specifically target the factors associated with sexual risk in order to maximize prevention efforts.

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