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Sexual and Reproductive Health Risk Behaviors among South African University Students: Results from a Representative Campus-Wide Survey

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Abstract

Background—Among South African university students, HIV prevalence is lower than in age-peers, but at 3.8% it is not negligible. We examined prevalence of factors potentially associated with HIV risk, focusing on partnership characteristics and consistent condom use. We hypothesized that contraceptive-related factors, e.g., desire to prevent pregnancy and not using hormonal contraceptives, would be positively associated with consistent condom use.

Methods—Data were drawn from a representative interviewer-administered survey of 2nd–4th year students conducted during registration at a university campus in KwaZulu-Natal.

Results—Of 576 students, 218 (83 women, 135 men) reported vaginal intercourse in the past two months. Of these, 7% of women and 43% of men reported past-year concurrent partnerships, and 24% knew/suspected partner non-monogamy. Although condom use at last intercourse was 90%, 2-month consistent use was 53% (women) and 73% (men). Reported hormonal contraception use

was low (women: 36.8%; men: 16.7%), and 68% used condoms for dual protection. In gender-stratified multivariable analyses, consistent condom use was higher for men who reported their partner did not use hormonal contraception (aOR=5.84; 95%CI=2.71, 12.57; $p<0.001$) and who reported using condoms for dual protection (vs. single protection) (aOR=2.46; 95%CI=1.43, 4.25; $p=0.001$). No contraception-related factors were associated with consistent condom use among women.

Conclusions—Sexual partnership characteristics potentially place sexually active university students at high HIV risk and should be investigated further. Among men, but not women, contraceptive concerns were associated with consistent condom use. Promoting condoms for dual protection may resonate with students and should be continued.

Keywords

Sexual risk behaviors; university students; South Africa; condom use; concurrent partners; sexual partnerships; dual protection

Introduction

University students, especially those in low and middle income countries, represent their nation's future leaders, and they are vital to its continued growth and development. As members of the age group in which HIV incidence is high, they may be especially vulnerable to HIV infection. Based on the most recent estimates, HIV prevalence among South African university-enrolled youth is lower than in their peers of the same age, but it is not negligible. According to a 2008–2009 national study of universities conducted by the South African Higher Education HIV and AIDS Programme (Higher Education HIV/AIDS Programme (HEAIDS), 2010), HIV prevalence was estimated at 3.4% among all students (4.7% of women and 2.0% of men), and it was 3.8% among the 65% who reported having had sex. By comparison, based on a 2008 national household study, prevalence was 6.7% and 21.1% among all women aged 15–19 and 20–24 years, respectively, and 2.5% and 5.1% among all men in the same age groups (Shisana et al., 2009). Risk for unintended pregnancy also is high among university students; a University of KwaZulu-Natal study, for example, found that of confirmed pregnancies, 64% in 2007 and 86% in 2008 were referred for termination (Higher Education HIV/AIDS Programme (HEAIDS), 2008).

Although the Higher Education HIV and AIDS Programme has highlighted the need for greater attention to the sexual and reproductive health needs of this important population, relatively few studies have been conducted among this group, and study samples have not always been representative, making it impossible to generalize to all students. As part of a of a larger project designed to test the efficacy of a small-group intervention to promote female condom use for at-risk female tertiary students (Mantell et al., 2015), we conducted a campus-wide survey with the goal of describing the sexual and reproductive health of the population from which intervention participants were recruited. This analysis focuses on two indicators of risk that have received less attention among university students and that were not included in the study conducted by HEAIDS: (1) partnership characteristics, including concurrent partnerships, and (2) consistent condom use.

Partnership Characteristics

Characteristics of partners and sexual networks constitute important risk factors for HIV and other STIs. Concurrent sexual partnerships may increase the risk of onward HIV transmission, although evidence is mixed regarding the importance of concurrency versus sequential multiple partnerships as a driver of HIV (Aral, 2010; Padian & Manian, 2011; Tanser et al., 2011). In most South African surveys, concurrency has not been well measured (Higher Education HIV/AIDS Programme (HEAIDS), 2010; Shisana et al., 2014). Age-disparate partnerships also have been associated with greater risk of HIV acquisition among young women in some but not all studies (de Oliveira et al., 2016; Harling et al., 2014; Leclerc-Madlala, 2008). These relationships are thought to increase infection risk for young women because older men have higher prevalence of HIV, and condom use may be less likely in these relationships. To extend knowledge of university students' potential risk for HIV acquisition, we ascertained risk characteristics of students' sexual partners, and asked about partnerships overlapping in time.

Consistent condom use

The best available evidence indicates that consistent condom use reduces the risk of HIV infection by 80% (Weller & Davis-Beaty, 2007). Even without the addition of hormonal contraceptives, consistent condom use is an effective method for pregnancy prevention (World Health Organization (WHO), 2000). In South Africa, consistent condom use remains a challenge. In a 2003 national household youth survey, 48.0% of women and 56.8% of men reported last-sex condom use, but only 28.6% and 39.2%, respectively, reported consistent use with their most recent partner (Pettifor et al., 2005). In a more recent 4-province survey of youth aged 18–24 years, 42.3% of women and 74.2% of men reported consistent use (Chirinda & Peltzer, 2014). In the South African National HIV Survey of 2012, 45.7% of youth aged 15–24 reported consistent condom use (Shisana et al., 2014).

Relatively little is known about consistent condom use or its correlates among university youth in high HIV prevalence regions such as South Africa. A 2003 study of university students in Durban found that only 25% reported consistent use, even though nearly 75% reported condom use at last sex (Maharaj & Cleland, 2006); a 2006 study of first-year students at the University of Western Cape reported that 38% used condoms consistently (Abels & Blignaut, 2011). A 2008 prospective study in Eastern Cape, using a volunteer sample, found that 51.3% of students reported past three-month consistent condom use, and that theoretically-derived constructs predicted subsequent use (Heeren, Jemmott, Mandeya, & Tyler, 2009).

Based on their 2003 study in Durban, Maharaj and Cleland argued that male condoms had become highly acceptable among university students, and suggested that emphasizing pregnancy prevention, a highly salient issue for university students, may help increase consistent use. In this study, we hypothesized that pregnancy- and contraceptive-related concerns (e.g. desire to avoid conception, non-use of hormonal contraceptives, condom use for contraception), would be positively related to consistent condom use. Given that university students may not perceive themselves to be at risk for HIV, desire to prevent pregnancy may be an important motivator for consistent condom use. Secondly, we were

interested in correlates from domains related to risk behaviors, including drug and alcohol use during sex, partnership characteristics, and perception of their own and partners' HIV risk.

Methods

Study design and sample selection

We systematically sampled students who were queuing to complete their registration during the January-February 2008 registration period on a university campus in Kwa-Zulu Natal. Students at this campus were both residential and commuter. Eligible students were aged 18 years or older and in their 2nd, 3rd or 4th year of undergraduate studies. Based on an estimate of 5,000 to 6,000 registering 2nd–4th-year students, an 80% response rate, and the anticipated number of participants our staff could recruit and interview on each registration day and venue, we set the sampling fraction at 0.20, for a target sample size of 800–960 students.

Recruitment teams were stationed at the entrance to each registration venue on the assigned registration dates and venues (as determined by the university). A recruiter approached every fifth student entering the registration area, introduced him/herself, informed the student that s/he had been randomly selected to be invited to participate in a confidential survey about sexual and reproductive health attitudes and experiences, and ascertained eligibility. (The fraction approached was later revised to every third student as response rate was less than 80%) If eligible, the student was given an information sheet and invited to participate. Reasons for ineligibility, and observed gender and race for those who refused, were documented.

Ethical approval to conduct the study was obtained from the Institutional Review Board of the New York State Psychiatric Institute-Columbia University Department of Psychiatry and two Research Ethics Committees at South African tertiary institutions, including the institution where the study was conducted. Ethical approval also was obtained from senior management of the university where the survey was conducted.

Data Collection and Measures

Students were interviewed on the day of recruitment in a private location by study staff who had prior interviewing experience. Eligibility was confirmed and written informed consent was obtained prior to the interview, which lasted 30–45 minutes. At completion, students were compensated ZAR20 (approximately \$3 at the time), and were given a referral card with contact information for on- and off-campus health resources.

The structured interview was pilot-tested with 10 students prior to fielding to ensure comprehensibility and cultural sensitivity. Measures for this analysis include the following:

- *Recency of vaginal intercourse and sexual and reproductive health history.* Students were asked when they last had vaginal intercourse (*within past two months, not within past two months but within past year, more than a year ago, never*). Among those who reported ever vaginal intercourse (hereafter,

intercourse), we ascertained age of sexual debut, and pregnancy history. All students were asked if they ever had anal sex, and if they ever had an STI.

The following items were asked of recently (past two months) sexually active students.

- *Partners, partnership characteristics, concurrency, consistent condom use, and substance use during sex.* We ascertained number of partners and frequency of condom use with all partners during the past two months (*never, sometimes, more than half the time, always*). For the most recent intercourse occasion, we ascertained partner characteristics, including type (*regular vs. non-regular*) and risk characteristics, and use of a range of contraceptive/disease prevention methods, including condoms, by self or partner. Students who reported they always used condoms in the past two months were defined as consistent condom users unless they did not report condom use at their most recent intercourse occasion, in which case they were coded inconsistent users. Past-year concurrency was defined as being in a sexual relationship with one partner and having sex with another partner. We ascertained frequency of drug and alcohol intoxication by participant and partners during sex over the past year (*never, sometimes, more than half the time, always*), dichotomized into ever/never.
- *Pregnancy intentions and contraceptive/disease prevention methods at last intercourse.* We ascertained pregnancy intentions for the next six months (*planning on getting/making your partner pregnant; trying to avoid pregnancy; open to possibility pregnancy; not thinking about it one way or the other*), dichotomized as *trying to avoid pregnancy vs. all other options*. For protection methods at last intercourse, we grouped responses of oral contraceptive pills, Depo Provera, or Nur Isterate into hormonal method for analysis; emergency contraception was considered separately. Those who reported male and/or female condom use were asked if they were used for *HIV/STI prevention, pregnancy prevention, or both*.
- *Risk perceptions, HIV testing, and use of campus health services.* Risk perceptions for pregnancy, HIV and other STIs were assessed with single items with four response options (*no risk at all, small, moderate, and great risk*), dichotomized to compare those who felt at *no risk* to *any degree of risk*. We ascertained testing history and likelihood of getting HIV tested in the next year, categorized as *very/somewhat likely vs. very/somewhat unlikely*, and ever use of campus health services.

Statistical analyses

All analyses were weighted to the distribution of the target population of 2nd through 4th-year students registering on this campus for the 2008 academic year using blinded data from the university registration system on the following variables: gender (male, female), race/ethnicity (African, white, Indian, colored, other), year of study, and faculty of study (3 categories). Weighting accounted for unequal probabilities of selection and non-response. Weights were inversely proportional to the probability of selection, and were derived by

comparing frequencies in the obtained sample with those in the population of students who actually registered. They were applied to all descriptive and analytic statistics generated.

Because both HIV risk and sexual behavior vary according to gender, and gender may also influence reporting of sexual behavior and contraceptive use, analyses were stratified by gender, except as described below for the multivariable analysis. We calculated means and frequency distributions to characterize the population and compare women and men students on sexual and reproductive history, using the Rao-Scott chi-squared test for weighted data. All subsequent analyses were conducted among recently sexually-active students, defined as women and men who had intercourse in the past two months. In bivariate analyses we examined associations between consistent condom use and hypothesized correlates separately among women and men. To increase the stability of estimates because the gender-specific sample sizes were small, especially for women, we developed a multiple logistic regression model among women and men together. We first included all variables that were associated bivariate with consistent condom use at $p \leq 0.10$ among either women or men, and then excluded those that were not significant at $p < 0.05$. Excluded variables were added back into the model one-by-one, and if they altered the associations of other predictors with the outcome by 10% or more, were retained as important confounders. The final model was stratified by gender for purposes of display, but we did not conduct tests of interaction due to small sample size. Analysis was conducted using SAS 9.2, with PROC SURVEYLOGISTIC employed for analysis of weighted data.

Results

Description of the sample

Overall, 1029 students were screened, 873 (84.8%) were eligible, and 591 (67.7% of those eligible) completed interviews. Of the 591 interviews, 15 were missing data on weighting variables and were excluded, leaving 576 in the analytic sample. According to campus registration data, 4424 students registered for this academic term. Among all registering students, 55% were of Indian and 37% were of African race/ethnicity; the respective percentages in the sample were 36% and 56%, indicating that Indian students were less likely to consent to the survey. Among all students, 54% were female and 46% were male; the respective percentages in the unweighted sample were 51% and 49%, indicating that women were slightly less likely to consent. The mean age of students was 20.43 years ($SD = 2.077$) (data not shown).

Approximately one-half of all students ever had vaginal intercourse, and one-third had vaginal intercourse in the past two months, with significant differences by gender (ever had intercourse: 40% of women vs 64% of men; intercourse in past two months: 24% women vs 43% of men, $p < 0.001$) (Table 1). Men were more likely than women to report ever engaging in anal sex (11% vs. 3%; $p = 0.002$). Only 1% of those who reported never having had vaginal intercourse reported anal sex (data not shown).

Characteristics of recently (past two months) sexually active students

Consistent condom use, partners and partnership characteristics, and drug and alcohol use during sex—Among the third of students ($N = 218$) who reported intercourse in the past two months, consistent condom use in the past two months was reported by more men (73%) than women (53%) ($p=0.009$). A concurrent partnership in the past year was reported by 43% of men and 7% of women ($p=0.001$). Men also were more likely than women to report more than one partner (30% vs. <1%) in the past two months (Table 2). Of most recent partners, 47% were not students and 33% were students at another university, with no gender differences; 24% of participants knew or suspected that their partner had had other partners since they had been together, and 16% felt at risk for getting HIV/STI from that partner, with no significant gender differences. Women's most recent partner was on average older than men's (median of 22.1 years vs. 18.9; $p<0.001$); 20% of women had a partner who was five years older than themselves, compared with 4% of men whose partner was five years younger ($p=0.001$) (Table 2).

Sex with substance use was substantial, with men more likely than women to report sex while drunk (47% vs. 25%; $p=0.007$) and while using drugs (20% vs. 4%; $p=0.007$) (Table 2).

Pregnancy intention and HIV/STI and pregnancy prevention methods used at last intercourse—The majority of recently sexually active students (57%) said they were “not thinking about pregnancy one way or the other,” 41% were “trying to avoid pregnancy,” and 2% were “open to the possibility” (Table 2). Male condom use was reported by 90% and female condom use by 2% at last intercourse, with no gender differences. Of those who used a condom at last intercourse, 68% reported use for both pregnancy and STI/HIV prevention, 29% for pregnancy prevention only, and 3% for disease prevention only.

At last intercourse, 37% of women and 17% of men ($p=0.005$) reported they or their partner were protected by a hormonal method, most commonly oral contraceptive pills; dual method use (hormonal method plus a condom) was reported by 30% of women and 13% of men ($p=0.013$). Additionally, 14% of women and 4% of men reported use of emergency contraception at last intercourse ($p=0.028$).

Other sexual and reproductive history characteristics, risk perceptions, use of services, and demographic characteristics by gender also are shown in Table 2.

Correlates of consistent condom use—In bivariate analyses, men whose last partner was a non-regular (vs. regular) partner were more likely to report consistent condom use (Table 3). Reported partner risk characteristics were not associated with consistent condom use among women or men. Trying to avoid pregnancy was not associated with consistent condom use among either women or men. Men who reported that their last intercourse occasion was not protected by a hormonal contraceptive method were more likely to be consistent condom users, but this relationship was not present among women. Other bivariate correlates of consistent condom use are shown in Table 3.

In the multivariable logistic regression model, men had higher odds of reporting consistent condom use than women (aOR=2.48; 95%CI=1.69, 3.64; $p<0.001$) (data not shown). Among men, those who reported that their partner was not using a hormonal contraceptive at last intercourse had higher odds of consistent condom use (aOR=5.84; 95%CI=2.71, 12.57; $p<0.001$), but this association was not present among women (Table 4). Using condoms for dual protection (vs. protection from pregnancy *or* HIV/STIs) also was associated with higher odds of consistent condom use among men (aOR=2.46; 95%CI=1.43, 4.25; $p=0.001$).

Other statistically significant correlates of consistent condom use among men were having a non-regular (vs. regular) partner at last sex and past 12-month drug use during sex (Table 4). Men who did not feel at risk for making a partner pregnant had higher odds of consistent condom use, as did those who never had an STI. Older age at first sex was associated with higher odds of consistent condom use. Relative to those of African race/ethnicity, men of Indian race/ethnicity had higher odds of consistent condom use.

Among women, having a non-regular (vs. regular) partner at last sex, living off campus, being very/somewhat likely to get tested for HIV in the next year, not feeling at risk for either HIV or pregnancy were associated with higher odds of consistent condom use (Table 4). Older age of first sex was associated with lower odds of consistent condom use. Relative to those of African race/ethnicity, Indian women had higher odds of consistent condom use.

Discussion

Using data from a comprehensive assessment of sexual and reproductive history among a representative sample of 2nd–4th-year students attending a South African university campus, this study focused on characteristics of students' partnerships and correlates of consistent condom use, especially those related to contraceptive intention. We found some support for our hypothesis that contraceptive motivations influenced consistent condom use. Most students who used condoms used them to prevent pregnancy only (68%) or both pregnancy and disease (29%); only 3% used condoms solely for disease prevention. These observations, as well as the finding that hormonal contraceptive use was relatively low, support the conclusion that students were relying heavily on condoms for pregnancy prevention. Moreover, men who reported that their most recent partner was not using a hormonal contraceptive and who used condoms for both pregnancy and disease prevention (vs. pregnancy or disease prevention only) were more likely to use condoms consistently. Among women, however, contraceptive intentions were not associated with consistent condom use. Nevertheless, we view with optimism high reports of condom use for protection from both HIV/STIs and unintended pregnancy, given that condoms are a dual-protection method and that emergency contraception is readily available, although possibly underutilized (Hoque & Ghuman, 2012), on campus.

There also is cause for concern in these findings. Consistent condom use, at 53% among women and 73% among men over the past two months, was lower than is desirable in a sexually active population, although it was higher than the level (45.7%) reported for this age group in the 2012 South African National HIV Survey (Shisana et al., 2014). When condom use is not consistent, risk of exposure to HIV depends in part on HIV prevalence

within partnership networks. We had no direct measures of HIV exposure, but we did assess factors other than condom use that are thought to be associated with risk of exposure to HIV. We found that a substantial proportion of recently sexually active students—43% of men and 7% of women—reported that they themselves had a concurrent partnership in the past year, and 30% of men had more than one partner in the past two months. The latter percentage is high, given that the same proportion of South African men aged 15–24 reported more than one partner in the past year in 2008 (Shisana et al., 2009). Additionally, about one-quarter of students knew or suspected that their most recent partner had had other partners since they were together, and 16% felt at risk for HIV or other STIs from their most recent partner. Considering age-disparate partnerships, 20% of women had partners who were five or more years older (although only 4% of men had partners who were younger by five or more years). Overall, our findings of inconsistent condom use, overlapping partnerships, age-disparate partnerships, and possibly partnerships with non-students suggest a substantial potential for exposure to HIV among sexually active university students.

Besides contraceptive intentions as predictors of consistent condom use, we observed that relative to students whose last partner was a regular partner, those whose last partner was not regular had higher odds of consistent condom use. This finding accords with prior research across many populations (Foss, Watts, Vickerman, & Heise, 2004). In contrast to what has been reported elsewhere concerning condom use in age-disparate partnership (Leclerc-Madlala, 2008), we did not find that these relationships were associated with lower odds of consistent condom use. Among men, those who used drugs during sex reported higher odds of consistent condom use, which accords with findings from the South African National HIV Survey (Shisana et al., 2014).

Our data did not give insight into why reported consistent condom use was significantly lower among women than men, as this association was present when we adjusted for other correlates of consistent condom use. This finding has been reported elsewhere (Maharaj & Cleland, 2008; Moyo, Levandowski, MacPhail, Rees, & Pettifor, 2008; Shisana et al., 2014), and could be due to differences in accuracy of reports between women and men, or to women having lesser control over condom use in their relationships than men. Some gender differences in correlates of consistent use also were observed, notably that among men, those whose first sex was at an older age were more likely to report consistent condom use, whereas among women those whose first sex was at an older age were less likely to report consistent use.

These data were collected in 2008, making them a valuable complement to data obtained in the same year by the South African Higher Education HIV and AIDS Programme (Higher Education HIV/AIDS Programme (HEAIDS), 2010). Evidence from general population data suggests that condom use at last intercourse declined among young people since 2008 (Shisana et al., 2014). Given the dearth of information on the sexual and reproductive health of South African university students, our data contribute even now to understanding the needs of this important population. A strength of the study is that we drew a probability sample and weighted it to the population of students from which it was drawn. Additionally, we collected detailed sexual and reproductive-related behavior data by trained interviewers, rather than by self-administered surveys; this enabled real-time probing of inconsistent

responses. However, social desirability bias tends to be greater with in-person interviews than with computer-assisted self-interviews (Kissinger et al., 1999). As with all studies that rely on self-report, if inconsistent condom users tended to describe themselves as consistent users this would diminish any true associations with other variables.

Additional limitations of this study include that it was conducted on one campus only, and that cross-sectional data make it difficult to interpret the direction of the associations. We also did not reach our target sample size, and the proportion of students who were recently sexually active was low, especially among women, limiting our power to detect factors associated with consistent condom use. It is possible that study estimates of recently sexually active students were low, and those of partners who were not university students were high, as the study was conducted shortly after students had returned from the semester break, during which time they may have been sexually inactive or active with non-campus partners.

Conclusions

In sum, we found that on a campus with both residential and non-residential students, consistent condom use was reported by 53% of women and 73% of men, levels that are well below what is needed to provide protection against HIV infection. Positive indicators were that 68% used condoms for pregnancy prevention and 29% used them for both pregnancy and disease prevention, and that among men, consistent condom use was influenced by contraceptive intention. Thus, although we did not find, as has been reported elsewhere (Maharaj & Cleland, 2006), that explicit desire to avoid pregnancy was associated with consistent condom use, condoms did seem to be acceptable. Characteristics of students' partnerships, however, may place them at risk for HIV acquisition, and the extent of these risk factors requires further investigation. Our findings add to growing evidence (Higher Education HIV/AIDS Programme (HEAIDS), 2010) that university students have substantial unmet sexual and reproductive health needs, but they also suggest that continued promotion of condoms for dual protection (with emergency contraception as a pregnancy prevention back-up) is an effective approach to increasing condom use among university students.

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Table 1

Demographic characteristics and sexual/reproductive history of 576 2nd to 4th year university students, KwaZulu-Natal, South Africa

	All (%) ^{1,2}	Men (%) ^{1,2}	Women (%) ^{1,2}	p-value
Total	576 (100%)	283 (45.5%)	293 (54.5%)	
Sexual history-last vaginal intercourse				
Within the past 2 months	218 (32.9)	135 (43.3%)	83 (24.2%)	<0.001
More than 2 months ago but within the past year	87 (14.4)	44 (16.0%)	43 (13.1%)	
More than a year ago	32 (3.3)	20 (4.5%)	12 (2.3%)	
Never had vaginal sex	238 (49.4)	83 (36.2%)	155 (60.4%)	
Ever had anal sex (n = 572)	37 (6.7%)	25 (10.7%)	12 (3.4%)	0.002

¹Sample Ns are shown; percentages are weighted to the entire population of registering students

²Column percents

Table 2

Sexual/reproductive health and demographic characteristics among 218 recently sexually active (past 2 months) 2nd to 4th year university students, KwaZulu-Natal, South Africa

	All N (%) ^{1,2}	Men (%) ^{1,2}	Women (%) ^{1,2}	p-value
Total	218 (100%)	135 (59.8%)	83 (40.2%)	0.009
Consistent condom use in the past two months	123 (64.9%)	84 (72.6%)	39 (53%)	
<u>Partnership Characteristics and Other Risk Behaviors</u>				
Concurrent sex partners in the past 12 months	68 (28.7%)	61 (43.3%)	7 (6.9%)	<0.001
Number of partners in the past 2 months				
One	172 (82.5%)	93 (70.4%)	79 (100%)	NA
Two	35 (17.5%)	34 (29.6%)	1 (0%)	
Any non-regular partners in the past 2 months	68 (31.6%)	61 (46.8%)	7 (8.9%)	<0.001
Type of partner at last vaginal intercourse				
Regular partner	190 (83.9%)	111 (75.8%)	79 (96%)	<0.001
Casual partner	28 (16.1%)	24 (24.2%)	4 (4%)	
Was last partner a student				
On this campus	44 (20.2%)	25 (17.1%)	19 (24.9%)	0.423
Other campus/university	70 (32.5%)	51 (35.7%)	19 (28%)	
Not a student	103 (47.2%)	58 (47.2%)	45 (47.2%)	
Knows/suspects partner has had other partners since being involved with her/him	53 (24.2%)	37 (28.9%)	16 (17.3%)	0.109
Feel at risk for HIV/STI from partner	42 (15.5%)	31 (19.1%)	11 (10.2%)	0.092
Last Partner's Age				
Mean (s.d.)	21.35 (0.275)	20.14 (0.316)	23.13 (0.435)	<0.001
Median (range)	19.77 (16–38)	18.86 (16–38)	22.07 (18–35)	
Age difference of most recent sex partner				
5 Years or more	24 (10%)	6 (3.7%)	18 (19.5%)	0.001
Less than 5 Years	194 (90%)	129 (96.3%)	65 (80.5%)	
Had sex while drunk (past year)	78 (38.2%)	56 (46.8%)	22 (25.2%)	0.007
Had sex while using drugs (past year)	20 (13.4%)	17 (19.7%)	3 (4.1%)	0.007
<u>Pregnancy Intentions and Methods Used at Last Vaginal Intercourse</u>				
Plans for becoming pregnant in the next 6 months				
Trying to avoid pregnancy	92 (41.3%)	54 (37%)	38 (47.8%)	0.265
Open to the possibility	6 (2.2%)	5 (3%)	1 (1%)	
Not thinking about it	116 (56.5%)	74 (60.1%)	42 (51.2%)	
Used male condom at last sex	190 (89.9%)	118 (90.7%)	72 (88.8%)	0.653
Used female condom at last sex	6 (2.1%)	4 (2.3%)	2 (1.9%)	0.862
Reason for using condoms				
For pregnancy prevention	50 (28.9%)	31 (28.7%)	19 (29.3%)	0.402
For disease prevention	9 (2.9%)	8 (4.2%)	1 (0.7%)	
For both	132 (68.2%)	82 (67%)	50 (70%)	
Used hormonal method (excluding emergency contraception) ³	50 (24.8%)	23 (16.7%)	27 (36.8%)	0.005

	All N (%) ^{1,2}	Men (%) ^{1,2}	Women (%) ^{1,2}	p-value
Used oral contraceptive pills	39 (20.4%)	16 (12.9%)	23 (31.6%)	0.008
Used Depo Provera	6 (2%)	6 (3.4%)	0 (0%)	NA
Used Nur Isterate	6 (2.5%)	2 (0.7%)	4 (5.3%)	0.007
Used Emergency Contraception	15 (8%)	6 (4.3%)	9 (13.6%)	0.028
Used withdrawal	0 (0%)	0 (0%)	0 (0%)	NA
Used Thigh Sex	3 (1.2%)	1 (1.2%)	2 (1.2%)	0.975
Used Dual Use Methods	39 (19.8%)	17 (12.9%)	22 (30.1%)	0.013
<u>Sexual/Reproductive History, Risk Perceptions, Use of Services</u>				
Age at first sex (in years)				
Mean (s.d.)	17.29 (0.171)	16.55 (0.221)	18.4 (0.247)	<0.001
Median (range)	17.04 (6–22)	16.25 (6–22)	18.09 (15–22)	
Ever had anal sex	26 (15.2%)	18 (18.4%)	8 (10.3%)	0.187
Pregnancy history				
Never had/partner never had pregnancy	186 (87.5%)	112 (84.9%)	74 (91.4%)	0.310
Had/partner had intended pregnancy	9 (4.7%)	7 (6.4%)	2 (2.3%)	
Had/partner never had unintended pregnancy	21 (7.7%)	14 (8.7%)	7 (6.3%)	
Ever had an STI	23 (8.6%)	13 (6.5%)	10 (11.7%)	0.173
Feels at risk for becoming pregnant	108 (49.1%)	70 (49.3%)	38 (48.8%)	0.947
Feels at risk for STIs	116 (51.8%)	77 (57.1%)	39 (44.1%)	0.113
Feels at risk for HIV	123 (54.4%)	83 (63.4%)	40 (41%)	0.004
Will get tested in the next year				
Likely	156 (67.6%)	95 (68.1%)	61 (66.9%)	0.891
Unlikely	61 (32.4%)	39 (31.9%)	22 (33.1%)	
Used campus health services	114 (47.1%)	63 (39.9%)	51 (57.8%)	0.032
<u>Other Demographic Characteristics</u>				
Race/ethnicity				
African	151 (51.3%)	96 (50.4%)	55 (52.6%)	0.642
Indian	55 (41.6%)	33 (40.8%)	22 (42.8%)	
Other	12 (7.1%)	6 (8.8%)	6 (4.6%)	
Residence during school				
Off Campus	94 (31.5%)	55 (27.9%)	39 (37%)	0.190
On Campus	124 (68.5%)	80 (72.1%)	44 (63%)	

¹ Sample Ns are shown; percentages are weighted to the entire population of registering students

² Column percents

Table 3

Bivariate correlates of past 2 months consistent condom use among recently sexually active (past 2 months) 2nd to 4th year university students, KwaZulu Natal, South Africa

	Men			Women		
	Bivariate Associations		p-value	Bivariate Associations		p-value
	Consistent Use N (%) ^{1,2}	Inconsistent Use N (%)		Consistent Use N (%) ^{1,2}	Inconsistent Use N (%)	
Total	84 (72.6%)	47 (27.4%)		39 (53%)	40 (47%)	
Partnership Characteristics and Other Risk Behaviors						
Has had concurrent sex partners in the past 12 months						
Yes	34 (69%)	24 (31%)	0.107	3 (54.6%)	3 (45.4%)	0.895
No	22 (85.1%)	6 (14.9%)		5 (50.7%)	4 (49.3%)	
Number of partners in the past 2 months						
One	62 (72.5%)	31 (27.5%)	0.973	38 (52.9%)	40 (47.1%)	NA
Two	20 (72.8%)	14 (27.2%)		1 (100%)	0	
Any non-regular partners in the past 2 months						
Yes	38 (73%)	22 (27%)	0.928	5 (81.5%)	1 (18.5%)	0.18
No	46 (72.3%)	25 (27.7%)		34 (50.5%)	39 (49.5%)	
Type of partner at last vaginal intercourse						
Regular partner	64 (66.1%)	45 (33.9%)	0.003	36 (51.5%)	39 (48.5%)	0.084
Non-regular partner	20 (93.7%)	2 (6.3%)		3 (87%)	1 (13%)	
Was last partner a student						
On this campus	17 (76.1%)	8 (23.9%)	0.867	6 (44.4%)	11 (55.6%)	0.624
On other campus/university	29 (69.8%)	19 (30.2%)		9 (48.7%)	10 (51.3%)	
Not a student	37 (71.7%)	20 (28.3%)		24 (59.9%)	19 (40.1%)	
Knows/suspects partner has had other partners since being together						
Yes	25 (81.1%)	11 (18.9%)	0.307	8 (58.5%)	7 (41.5%)	0.779
No	54 (72.4%)	29 (27.6%)		28 (53.8%)	30 (46.2%)	
Feels at risk for HIV/STI from partner						
Yes	15 (60%)	15 (40%)	0.135	4 (38.4%)	6 (61.6%)	0.327
No	68 (75.8%)	31 (24.2%)		35 (55.8%)	32 (44.2%)	

	Men			Women		
	Bivariate Associations		p-value	Bivariate Associations		p-value
	Consistent Use N (%) ^{1,2}	Inconsistent Use N (%)		Consistent Use N (%) ^{1,2}	Inconsistent Use N (%)	
Last Partner's Age						
Mean (s.d.)	19.61 (0.233)	21.49 (0.915)		22.4 (0.584)	23.85 (0.645)	0.100
Median (range)	18.75 (16–27)	19.47 (17–38)	0.048	20.89 (19–35)	23.16 (18–35)	
Age difference of most recent sex partner						
5 Years or more	3 (50%)	3 (50%)	0.219	5 (31.7%)	11 (68.3%)	0.095
Less than 5 Years	81 (73.5%)	44 (26.5%)		34 (57.7%)	29 (42.3%)	
Have had sex while drunk						
Yes	35 (76.9%)	21 (23.1%)	0.309	10 (50.6%)	9 (49.4%)	0.846
No	49 (68.7%)	26 (31.3%)		29 (53.7%)	31 (46.3%)	
Have had sex while using drugs						
Yes	13 (90.6%)	4 (9.4%)	0.008	1 (52.9%)	2 (47.1%)	0.999
No	71 (68.1%)	43 (31.9%)		38 (55%)	38 (47%)	
Pregnancy Intentions and Methods Used at Last Vaginal Intercourse						
Plans for becoming pregnant next 6 months						
Trying to avoid becoming pregnant	31 (67.9%)	20 (32.1%)	0.296	18 (51.3%)	20 (48.7%)	0.710
Not thinking about it, open to possibility	53 (76.8%)	25 (23.2%)		21 (56.2%)	18 (43.8%)	
Protected by hormonal contraception at last sex						
Yes	9 (51.7%)	13 (48.3%)	0.043	13 (56.3%)	13 (43.7%)	0.705
No	75 (76.8%)	34 (23.2%)		26 (51%)	27 (49%)	
Used female condom at last sex						
Yes	0	2 (100%)	NA	1 (100%)	0	NA
No	84 (73.8%)	45 (26.2%)		38 (52.3%)	40 (47.7%)	
Reason for using condoms						
For either pregnancy or disease prevention	22 (68.8%)	16 (31.2%)	0.099	11 (57.9%)	9 (42.1%)	0.769
For both pregnancy and disease prevention	61 (82.9%)	18 (17.1%)		28 (62.5%)	18 (37.5%)	
Used dual methods at last sex						
Yes	9 (67.1%)	7 (32.9%)	0.628	13 (69.5%)	8 (30.5%)	0.122
No	75 (73.4%)	40 (26.6%)		26 (45.9%)	32 (54.1%)	
Used emergency contraception last sex						

	Men			Women		
	Bivariate Associations		p-value	Bivariate Associations		p-value
	Consistent Use N (%) ^{1,2}	Inconsistent Use N (%)		Consistent Use N (%) ^{1,2}	Inconsistent Use N (%)	
Yes	3 (57.4%)	3 (42.6%)	0.409	3 (54.9%)	5 (45.1%)	0.916
No	81 (73.3%)	44 (26.6%)		36 (52.7%)	35 (47.3%)	
Sexual/Reproductive History, Risk Perceptions, Use of services						
Age at first sex (in years)						
Mean (s.d.)	16.93 (0.218)	15.48 (0.491)		18.04 (0.38)	18.9 (0.262)	
Median (range)	16.51 (9–22)	15.01 (6–20)	0.008	17.56 (15–22)	18.45 (15–21)	0.065
Ever had anal sex						
Yes	13 (87.7%)	4 (12.3%)		4 (57.9%)	4 (42.1%)	
No	71 (69.3%)	43 (30.7%)	0.069	34 (52%)	36 (48%)	0.767
Pregnancy History						
Never had/partner never had pregnancy	76 (79.4%)	32 (20.6%)		35 (53.9%)	35 (46.1%)	
Had/partner had pregnancy (intended/unintended)	7 (37.8%)	14 (62.2%)	0.003	4 (44%)	5 (56%)	0.606
Ever had an STI						
Yes	3 (24.5%)	10 (75.5%)		3 (34.3%)	7 (65.7%)	
No	81 (76.7%)	36 (23.3%)	<0.001	36 (55.6%)	33 (44.4%)	0.266
Feels at risk for becoming/making a partner pregnant						
Yes	37 (62%)	31 (38%)		17 (50.6%)	20 (49.4%)	
No	47 (84.8%)	14 (15.2%)	0.004	22 (56.3%)	19 (43.7%)	0.667
Feels at risk for STIs						
Yes	41 (65.3%)	34 (34.7%)		13 (45.4%)	24 (54.6%)	
No	43 (82.4%)	13 (17.6%)	0.039	26 (58.8%)	16 (41.2%)	0.325
Feels at risk for HIV						
Yes	47 (68.9%)	33 (31.1%)		13 (30.6%)	26 (69.4%)	
No	37 (79%)	14 (21%)	0.225	26 (69.4%)	14 (30.6%)	0.002
Will get tested in the next year						
Likely	57 (68.1%)	35 (31.9%)		27 (49.6%)	31 (50.4%)	
Unlikely	27 (84%)	11 (16%)	0.044	12 (59.9%)	9 (40.1%)	0.505
Used campus health services						
Yes	35 (62.4%)	26 (37.6%)	0.04	20 (45.3%)	29 (54.7%)	0.179

	Men			Women		
	Bivariate Associations		p-value	Bivariate Associations		p-value
	Consistent Use N (%) ^{1,2}	Inconsistent Use N (%)		Consistent Use N (%) ^{1,2}	Inconsistent Use N (%)	
No	49 (79.4%)	21 (20.6%)		19 (63.6%)	11 (36.4%)	
Other Demographic Characteristics						
Residence during school						
On Campus	29 (54.2%)	24 (45.8%)		11 (27.9%)	26 (72.1%)	
Off Campus	55 (79.6%)	23 (20.4%)	0.001	28 (68.1%)	14 (31.9%)	0.002
Race/ethnicity						
African	50 (52.7%)	43 (47.3%)		21 (37.0%)	32 (63.0%)	
Indian	29 (93.2%)	3 (6.8%)	<0.001	15 (72.6%)	5 (27.4%)	0.028
Other	5 (89.4%)	1 (10.6%)		3 (63.2%)	3 (36.8%)	

¹ Sample Ns are shown; percentages are weighted to the entire population of registering students

² Row percents are shown

Multivariable correlates of past 2 months consistent condom use among recently sexually active 2nd to 4th year women and men university students, KwaZulu Natal, South Africa

Table 4

<u>Partnership Characteristics and Other Risk Behaviors</u>				
Type of partner at last vaginal intercourse	Men <i>n</i> =113		Women <i>n</i> =63	
	aOR (95% CI)	p-value	aOR (95% CI)	p-value
Regular Partner	Ref.		Ref.	
Non-Regular Partner	6.38 (2.68, 15.20)	<0.001	117.03 (4.90, ∞)	0.003
Age difference of most recent sex partner				
5 Years or more	Ref.		Ref.	
Less than 5 Years	1.33 (0.48, 3.65)	0.584	1.67 (0.57, 4.88)	0.346
Have had sex while using drugs				
No	Ref.		Ref.	
Yes	9.25 (2.69, 31.80)	<0.001	0.12 (0.01, 2.59)	0.175
<u>Pregnancy Intention and Contraceptive Methods</u>				
Protected by hormonal contraception at last sex				
Yes	Ref.		Ref.	
No	5.84 (2.71, 12.57)	<0.001	0.74 (0.36, 1.52)	0.405
Reason for using condoms				
For either pregnancy or disease prevention	Ref.		Ref.	
For both pregnancy and disease prevention	2.46 (1.43, 4.25)	0.001	0.64 (0.32, 1.27)	0.200
<u>Sexual/Reproductive History, Risk perceptions, Use of services</u>				
Age at first sex (in years)	1.17 (1.05, 1.31)	0.007	0.41 (0.31, 0.54)	<0.001
Ever had anal sex				
No	Ref.		Ref.	
Yes	1.17 (0.52, 2.65)	0.707	∞	0.984
Pregnancy History				
Had/partner had pregnancy (intended/unintended)	Ref.	0.003	Ref.	0.987
Never had/partner never had pregnancy	2.95 (1.46, 5.97)		∞	
Ever had an STI				

	Men <i>n</i> =113		Women <i>n</i> =63	
	aOR (95% CI)	p-value	aOR (95% CI)	p-value
Yes	Ref.		Ref.	
No	7.28 (3.02, 17.55)	<0.001	∞	0.988
Feels at risk for becoming/making a partner pregnant				
Yes	Ref.	<0.001	Ref.	<0.001
No	3.13 (1.75, 5.6)		6.17 (2.75, 13.85)	
Feels at risk for STIs				
No	Ref.		Ref.	
Yes	1.15 (0.61, 2.15)	0.669	0.85 (0.43, 1.69)	0.647
Will get tested in the next year				
Unlikely	Ref.		Ref.	
Likely	1 (0.55, 1.82)	1.000	4.49 (2.17, 9.27)	<0.001
Used campus health services				
Yes	Ref.		Ref.	
No	1.25 (0.75, 2.10)	0.391	1.53 (0.79, 2.99)	0.211
Other Demographic Characteristics				
Residence during school				
On Campus	Ref.		Ref.	
Off Campus	0.90 (0.50, 1.62)	0.713	5.61 (2.18, 14.39)	<0.001
Race				
African	Ref.		Ref.	
Indian	6.50 (2.98, 14.18)	<0.001	3.82 (1.43, 10.18)	0.007
Other	1.72 (0.60, 4.96)	0.314	0.77 (0.18, 3.33)	0.723