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Audio computer-assisted survey instrument versus face-to-face interviews: optimal method for detecting high-risk behaviour in pregnant women and their sexual partners in the south of Brazil

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Summary

Audio computer-assisted survey instrument (ACASI) has been shown to decrease under-reporting of socially undesirable behaviours, but has not been evaluated in pregnant women at risk of HIV acquisition in Brazil. We assigned HIV-negative pregnant women receiving routine antenatal care at in Porto Alegre, Brazil and their partners to receive a survey regarding high-risk sexual behaviours and drug use via ACASI ($n = 372$) or face-to-face (FTF) ($n = 283$) interviews. Logistic regression showed that compared with FTF, pregnant women interviewed via ACASI were significantly more likely to self-report themselves as single (14% versus 6%), having >5 sexual partners (35% versus 29%), having oral sex (42% versus 35%), using intravenous drugs (5% versus 0), smoking cigarettes (23% versus 16%), drinking alcohol (13% versus 8%) and using condoms during pregnancy (32% versus 17%). Therefore, ACASI may be a useful method in assessing risk behaviours in pregnant women, especially in relation to drug and alcohol use.

Keywords

HIV; pregnancy; ACASI; substance use; high-risk sexual behaviours; risk factors; antenatal care; prevention

INTRODUCTION

Preventive efforts targeting women at risk for adverse pregnancy outcomes can deliver significant public health impact. For example, interventions aimed at preventing new infections with sexually transmitted infections (STIs) during pregnancy can avert transmission of life-threatening, chronic illness to newborn infants.^{1–6} Syphilis, hepatitis B,

HIV and other STIs have potentially severe adverse outcomes if the mother is infected during pregnancy.^{7–10} Similarly, substance use during pregnancy, including alcohol and cigarette use, increases the odds of delivering low-birth weight or preterm infants, as well as augmenting the potential of pregnancy complications (premature rupture of membranes and placental abruption) and infant death.^{11–14}

In order to design appropriate and effective interventions to diminish risk behaviours in pregnancy, an accurate and localized understanding of sexual and behavioural factors is necessary. Data obtained during medical visits often rely on self-reports, which may be inaccurate with notable under-reporting due to social desirability.^{15,16} Assessment of risk may be challenging, which in turn makes it difficult to interpret results and design appropriate interventions to address key risk factors. Self-reporting of risk or undesirable behaviours has been shown to increase when face-to-face interviews (FTF) and self-administered questionnaires are replaced with audio computer-assisted survey instruments (ACASI). Despite wide variations in geography and populations sampled, a large number of studies show that ACASI can decrease non-response rates and increase reporting of socially undesirable sexual behaviours.^{15,17–21} However, ACASI efficacy has not been widely studied in women during pregnancy, especially in terms of non-sexual behaviours such as cigarette smoking and illicit drug use. Other than being vulnerable to disease acquisition and subsequent disease transmission to infants, pregnant women may also feel less comfortable reporting risky behaviours because of the additional scrutiny surrounding gestation. Prior studies have shown that the accuracy of self-reporting of drug use diminishes if individuals fear negative consequences, and a pregnant woman speaking to a medical professional in the context of an antenatal visit could face repercussions not limited to jail time, loss of custody and legal ramifications.^{22,23} Thus, the increased sense of confidentiality gained by not having to provide answers directly to clinical personnel with ACASI may be especially informative in this specific population.

Porto Alegre, a cosmopolitan city located in the south of Brazil, has become the epicentre of the Brazilian HIV epidemic recently, a finding likely due to higher intravenous drug use, particularly in the male population. The prevalence of HIV in Porto Alegre among women receiving antenatal care rose from 0.5% in 1997 to 3.5% in 2007.^{24,25} A pilot study of HIV-1 serodiscordant couples conducted in southern Brazil demonstrated that heterosexual transmission appeared to occur more frequently from HIV-infected men to women (67%) as described in studies conducted in Africa and Europe.²⁶ The population evaluated in this study is composed of low-to-middle income men and women receiving care at two large tertiary county medical centres in Porto Alegre, Brazil, where the HIV seroprevalence rates range from 3% to 5% in women receiving antenatal care.⁴ In order to correctly identify risk behaviours during pregnancy in our clinic populations, we compared responses to sensitive questions about sexual practices and substance use using ACASI and FTF interviews in pregnant women receiving antenatal care.

METHODS

Using a quasi-experimental design, we enrolled self-reported HIV-negative pregnant women receiving antenatal care at either Hospital Conceição or Hospital Femina and their male

sexual partners, if available. Inclusion criteria included pregnant women who were HIV-negative, in a steady heterosexual relationship for >3 months and older than 18 years of age. To minimize differences between sites, pregnant women at both antenatal clinics were recruited by the same research team using the same script.

Interview process

At Hospital Conceição, women with a first antenatal clinic from December 2010 to January 2011 were interviewed FTF and women seen for a first antenatal visit from January to March 2011 were interviewed via ACASI. At Hospital Femina, patients enrolling from February to June 2011 were interviewed FTF and women enrolling July to November 2011 were interviewed by ACASI. Male partners, if available, were offered participation in the study as well. Women and their enrolled partners were interviewed only once, either via ACASI or via FTF surveys. Male partners that enrolled were interviewed in the same manner as their pregnant partners.

After informed consent was obtained, a research assistant not involved in the patient's medical care administered a confidential scripted oral or ACASI survey in Portuguese, questioning participants on demographics, time in their current relationship, risk factors for HIV acquisition including sexual behaviours and knowledge of partner's HIV status, as well as substance use. The questions were asked via the same script, but with ACASI; pictures were added to help clarify some of the questions. ACASI was administered on Hewlett Packard (Palo Alto, CA, USA) iPAQ hand-helds using the version of QDS software for hand-helds (HAPI).

Statistical analysis

Two-sample *t*-test and Pearson's chi-square statistics were used to analyse continuous and categorical outcomes, respectively. We used dichotomous predictors and outcomes in our chi-squares for Table 2, with one degree of freedom. Univariate and multivariate logistic regression analysis was performed to evaluate parameters associated with affirmative responses to questions regarding high-risk sexual behaviours and substance use. Variables included in the multivariate model were interview site, marital status, cigarette use during pregnancy, alcohol use in pregnancy and condom use. A sub-analysis of partner concordance was performed using multivariate logistic regression to explore if method of interview influenced the frequency of partner-discordant answers to sensitive behaviour questions. All computations were done using STATA version 11.1. (Cary, NC, USA). IRB approval was obtained through both the UCLA Institutional Review Board and the Grupo Conceição Institutional Review Board.

RESULTS

Of 1422 eligible women who met inclusion criteria and were scheduled for a antenatal visit during the time period of interest, 654 (46%) agreed to participate in this study, with 371 receiving the FTF survey and 283 receiving the ACASI survey. Of 768 who did not participate, 360 (47%) did not show for their scheduled appointment and 267 (35%) were discharged from clinic prior to being approached by study personnel. Only 46 (6%) of

eligible women who were asked to participate refused enrolment, and there was no difference in refusals between the ACASI group (5%) and FTF interview group (7%). Approximately half of the male partners (313; 48%) participated in the study with 140 men taking the ACASI survey and 173 men taking the FTF survey (Figure 1).

Sociodemographic data

Table 1 displays the demographic characteristics for pregnant women and their partners. The mean age of pregnant women was 29 years, ranging from 18 to 46 years. Approximately 91% ($n = 591$) of women were living with or married to their partners, 49% ($n = 318$) were employed, and 72% ($n = 474$) self-identified as white. For the male sexual partners, the mean age of participants was 32 years, ranging from 18 to 66 years. Ninety-four percent ($n = 293$) stated that they were living or married to their pregnant partners, 89% ($n = 278$) were employed and 75% ($n = 234$) self-identified as white. This is consistent with regional demographics for southern Brazil where the population is predominantly Caucasian. There were no significant differences in the demographic characteristics of participants between the two clinic sites except that the male partners seen at Femina were less likely to identify themselves as white as compared with Conceição (67% versus 83%; $P < 0.001$). Women were more likely to report themselves as married during the FTF interviews at both sites.

Risk behaviour

Women were significantly more likely to report a higher number of lifetime sexual partners and engaging in oral sex during pregnancy when interviewed using ACASI as compared with FTF (Table 2). A larger percentage of men also self-reported having oral sex and extra-relationship affairs on ACASI as opposed to FTF interviews. Although not statistically significant, more men and women reported anal sex on ACASI than those who were interviewed FTF. Interestingly, pregnant women and their partners were more likely to report not using condoms on FTF interviews both prior to pregnancy and during pregnancy. As expected, condom use decreased during the time of pregnancy for both women and men. In women, 77% never used condoms during pregnancy in comparison with 47% never using condoms prior to pregnancy. In men, 77% never used condoms during pregnancy while 57% never used condoms prior to pregnancy. When questioned about substance use during pregnancy, pregnant women were more likely to report cigarette use, alcohol use and intravenous drug use (IVDU) on ACASI rather than FTF interviews. This trend was not observed in the male partners. In general, our non-response/missing response rate was higher in the ACASI interviews with nine men (7%) skipping all the questions regarding HIV risk factors as compared with one (0.05%) in the FTF interviews.

Factors affecting reporting of the following risk behaviours were tested in univariate and multivariate analysis (Table 3): alcohol use, smoking cigarettes, having 'outside' relationships and not using condoms. Odds ratios could not be calculated for IVDU because none of the pregnant women interviewed via FTF reported this activity. Both women and men were more likely to report never using condoms when interviewed FTF, even when adjusted for possible confounders (adjusted odds ratio [AOR] women: 0.47, 95% confidence interval [CI] [0.32–0.69], AOR men: 0.33, 95% CI [0.18–0.58]). Women who identified themselves as non-White, had fewer years of schooling, and had been pregnant >2 times,

had higher odds of smoking during pregnancy. Men were twice as likely to report extramarital affairs on ACASI. Being married significantly decreased odds of having an affair during pregnancy in women but not in men.

Figure 2 shows partner-specific concordant responses to questions about sexual behaviour in participants who both denied infidelity. We noted high concordance rates for sexual behaviours with both ACASI and FTF interview techniques.

DISCUSSION

Our results show that pregnant women are more likely to report activities known to be unhealthy during pregnancy when interviewed via ACASI rather than FTF, especially in relation to substance use, including alcohol, cigarettes and intravenous drugs. Although these differences are statistically significant, given the low numbers of participants reporting substance use, the clinical relevance of these findings is debatable. We do not have objective data, such as a toxicology screen, to evaluate the degree of under-reporting of these activities, but a study performed on club-going adults in Porto Alegre showed that only 1.3% of men/women interviewed used crack in past 90 days, which is similar to rates endorsed by women on ACASI.²⁷ Furthermore, clinicians working in the hospital report that about 1% of newborns appear to have symptoms of *in utero* drug exposure (approximately 4 each month of 400 births), which is also consistent with our results.²⁸ However, it is important to note that a prior study performed on pregnant women in the USA showed that when comparing ACASI to toxicology screens, there was significant underreporting of drug use. Future studies should validate reports from ACASI with toxicological screening as well.²⁹

Another interesting finding is that women were less likely to report never using condoms during pregnancy on ACASI than in FTF interviews. This was a strong relationship that persisted in the multivariate analysis. Although non-condom use may initially appear to be a censured behaviour, it may also represent the social norm for married pregnant couples to *not* use condoms during pregnancy. Stating that one is using condoms during a FTF interview may represent a socially undesirable answer, suggesting that at least one partner in the relationship is not faithful. Other possible reasons for this strong relationship include interviewer bias during the FTF interview or confusion regarding the response categories. A recent meta-analysis of prior studies comparing responses to questions about condom use on ACASI versus FTF in low-to-middle income countries showed heterogeneity in results without any clear pattern.³⁰

In male partners, results were more variable with regard to sexual behaviours; however, there was still a pattern of presenting more socially acceptable answers through FTF than ACASI interviews. Men were more likely to report affairs and oral sex on ACASI surveys, but less likely to affirm vaginal sex and no condom use. For men in southern Brazil, reporting frequent vaginal sex and no condom use with a pregnant spouse would likely be viewed as a more desirable social norm as opposed to engaging in oral sex or having extra-relationship affairs, which would be consistent with less acceptable behaviour. We did not find increased reporting of substance use on ACASI in men, which was not unexpected since this behaviour would not necessarily be stigmatized in males. This finding is consistent with a

previous study performed in Brazil focusing on self-reporting of substance use among drug users, which also found no differences in affirmative response by interview type.³¹

As expected, condom use decreased during the time of pregnancy for both women and men. Although we do not know all the context surrounding condom use prior to pregnancy (i.e. if these pregnancies were intentional), it is important to note that women were less likely to use condoms with their partners during pregnancy. Given the relatively high rate of infidelity reported by men (16%) as well as drug use, these women are at risk for acquisition of STIs.

This study is unique in its focus on responses from women and their sexual partners during the vulnerable time of pregnancy, when acquiring STIs and using substances could not only affect the patients but also their developing infants. Our results are concordant with a prior study performed in Brazil in non-pregnant women, who were more likely to report STI risk behaviour on ACASI,³² a trend consistent with results from Zimbabwe and Malawi,^{15,33} but not in other countries including India.³⁴ In the USA, non-pregnant women interviewed at an STD clinic were more likely to report sensitive sexual behaviours on ACASI but not illicit drug use behaviours, which differs from our results.³⁵ However, pregnant women may feel another layer of stigma when questioned about substance use, and thus, feel more comfortable reporting use of cigarettes, alcohol and illicit drugs in a person-to-machine interaction that avoids any interviewer judgement as well as any potential negative repercussions from disclosing these activities.

Limitations of the study include the non-simultaneous administration of ACASI and FTF interviews to the study population. This was due to study logistics (i.e. difficulties in importation of hand-held devices to Brazil). Nevertheless, there were few differences observed in the demographics of the study population, except that women were more likely to report themselves as married or living with their partners on FTF interviews than in ACASI interviews. Although these two interview groups were temporally distinct by a few months, there is no reason to believe that more couples would be married during the months of ACASI administration. This difference, therefore, may reflect pregnant women choosing more socially desirable responses on FTF interviews. In order, to increase subject enrolment, two hospital sites recruited participants. These two hospitals are geographically distinct (approximately 20 km apart), but both are part of the same public hospital group (Grupo Hospitalar Conceição) and both serve similar disenfranchised populations in Porto Alegre.

In conclusion, our study results suggest that ACASI may be a more reliable instrument for the screening of pregnant women and their partners for high-risk behaviours, particularly with regard to drug use. Future studies should focus on validating ACASI response with biomarkers to assess levels of underreporting, such as screening urines of participants for drug use, as has been done in other contexts.²⁹ Meanwhile, increased use of ACASI should be considered by health-care providers serving pregnant women during antenatal care in order to better identify populations at risk and facilitate implementation of appropriate interventions to decrease behaviours associated with adverse pregnancy outcomes.

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References

1. Kinuthia J, Kiarie JN, Farquhar C, et al. Cofactors for HIV-1 incidence during pregnancy and postpartum period. *Curr HIV Res*. 2010; 8:510–4. [PubMed: 20946093]
2. Moses SE, Tosswill J, Sudhanva M, Poulton M, Zuckerman M. HIV-1 seroconversion during pregnancy resulting in vertical transmission. *J Clin Virol*. 2008; 41:152–3. [PubMed: 18055251]
3. Moodley D, Esterhuizen T, Reddy L, et al. Incident HIV infection in pregnant and lactating women and its effect on mother-to-child transmission in South Africa. *J Infect Dis*. 2011; 203:1231–4. [PubMed: 21398393]
4. Nielsen-Saines K, Melo M, Varella I, et al. Primary HIV-1 infection during pregnancy: high rate of HIV-1 MTCT in a cohort of patients in southern Brazil. *Retrovirology*. 2008; 5(Suppl 1):01.
5. Struik SS, Tudor-Williams G, Taylor GP, et al. Infant HIV infection despite 'universal' antenatal testing. *Arch Dis Child*. 2008; 93:59–61. [PubMed: 17855439]
6. Lu, L.; Legwaila, K.; Motswere, C.; Smit, M.; Jimbo, W.; Creek, T. HIV incidence in pregnancy and the first post-partum year and implications for PMTCT programs; Francistown, Botswana. Program and abstracts of the 16th Conference on Retroviruses and Opportunistic Infections; Montreal, Canada. 2009. Abstract 91
7. Feigin, RD.; Cherry, J.; Kaplan, SL.; Demmler-Harrison, GJ., editors. Feigin and Cherry's Textbook of Pediatric Infectious Diseases. 6. Saunders; Philadelphia, PA: 2009.
8. Hutto C, Arvin A, Jacobs R, et al. Intrauterine herpes simplex virus infections. *J Pediatr*. 1987; 110:97–101. [PubMed: 3794894]
9. Shapiro CN, Margolis HS. Impact of hepatitis B virus infection on women and children. *Infect Dis Clin North Am*. 1992; 6:75–96. [PubMed: 1533649]
10. Pergam SA, Wang CC, Gardella CM, Sandison TG, Phipps WT, Hawes SE. Pregnancy complications associated with hepatitis C: data from a 2003–2005 Washington state birth cohort. *Am J Obstet Gynecol*. 2008; 199:38.e1–9. [PubMed: 18486089]
11. Gray R, Bonellie SR, Chalmers J, et al. Contribution of smoking during pregnancy to inequalities in stillbirth and infant death in Scotland 1994–2003: retrospective population based study using hospital maternity records. *BMJ*. 2009; 339:b3754. [PubMed: 19797343]
12. Department of Health and Human Services. Services DoHaH. The health consequences of smoking: a report of the Surgeon General. Washington DC: Government Printing Office; 2004.
13. Abel EL, Sokol RJ. Fetal alcohol syndrome is now leading cause of mental retardation. *Lancet*. 1986; 2:1222. [PubMed: 2877359]
14. Zelson C, Rubio E, Wasserman E. Neonatal narcotic addiction: 10 year observation. *Pediatrics*. 1971; 48:178–89. [PubMed: 5560613]
15. Langhaug LF, Cheung YB, Pascoe SJ, et al. How you ask really matters: randomised comparison of four sexual behaviour questionnaire delivery modes in Zimbabwean youth. *Sex Transm Infect*. 2011; 87:165–73. [PubMed: 20943824]
16. Weinhardt LS, Carey MP, Maisto SA, Carey KB, Cohen MM, Wickramasinghe SM. Reliability of the timeline follow-back sexual behavior interview. *Ann Behav Med*. 1998; 20:25–30. [PubMed: 9755348]
17. Langhaug LF, Sherr L, Cowan FM. How to improve the validity of sexual behaviour reporting: systematic review of questionnaire delivery modes in developing countries. *Trop Med Int Health*. 2010; 15:362–81. [PubMed: 20409291]
18. Macalino GE, Celentano DD, Latkin C, Strathdee SA, Vlahov D. Risk behaviors by audio computer-assisted self-interviews among HIV-seropositive and HIV-seronegative injection drug users. *AIDS Educ Prev*. 2002; 14:367–78. [PubMed: 12413183]

19. Des Jarlais DC, Paone D, Milliken J, et al. Audio-computer interviewing to measure risk behaviour for HIV among injecting drug users: a quasi-randomised trial. *Lancet*. 1999; 353:1657–1. [PubMed: 10335785]
20. Mensch BS, Hewett PC, Erulkar AS. The reporting of sensitive behavior by adolescents: a methodological experiment in Kenya. *Demography*. 2003; 40:247–68. [PubMed: 12846131]
21. Simoes AA, Bastos FI, Moreira RI, Lynch KG, Metzger DS. A randomized trial of audio computer and in-person interview to assess HIV risk among drug and alcohol users in Rio De Janeiro, Brazil. *J Subst Abuse Treat*. 2006; 30:237–43. [PubMed: 16616168]
22. Golub A, Liberty HJ, Johnson BD. The variation in arrestees' disclosure of recent drug use across locations, drugs, and demographic characteristics. *J Drug Issues*. 2005; 35:917–40. [PubMed: 18852842]
23. Bornstein BH. Pregnancy, drug testing, and the fourth amendment: legal and behavioral implications. *J Fam Psychol*. 2003; 17:220–8. [PubMed: 12828018]
24. Leukefeld CG, Pechansky F, Martin SS, et al. Tailoring an HIV-prevention intervention for cocaine injectors and crack users in Porto Alegre, Brazil. *AIDS Care*. 2005; 17(Suppl 1):S77–87. [PubMed: 16096120]
25. Nielsen, K.; Santos, VV.; Bastos, FI., et al., editors. A pilot study using rapid HIV serologic testing during the peripartum period in Brazil. American Pediatric Society/Society for Pediatric Research (APS/SPR); 2001 April – May 2001; Baltimore, MD.
26. Melo MG, Santos BR, De Cassia Lira R, et al. Sexual transmission of HIV-1 among serodiscordant couples in Porto Alegre, southern Brazil. *Sex Transm Dis*. 2008; 35:912–5. [PubMed: 18607309]
27. Pechansky F, Remy L, Surratt HL, et al. Age of sexual initiation, psychiatric symptoms, and sexual risk behavior among Ecstasy and LSD users in Porto Alegre, Brazil: a preliminary analysis. *J Drug Issues*. 2011; 41:217. [PubMed: 22287797]
28. Varella, I. Hospital epidemiologist, Grupo Hospitalar Conceicao. Yeganeh, N., editor. Porto Alegre: 2012.
29. Grekin ER, Svikis DS, Lam P, et al. Drug use during pregnancy: validating the Drug Abuse Screening Test against physiological measures. *Psychol Addict Behav*. 2010; 24:719–23. [PubMed: 21198230]
30. Phillips AE, Gomez GB, Boily MC, Garnett GP. A systematic review and meta-analysis of quantitative interviewing tools to investigate self-reported HIV and STI associated behaviours in low- and middle-income countries. *Int J Epidemiol*. 2010; 39:1541–5. [PubMed: 20630991]
31. Simoes AA, Bastos FI, Moreira RI, Lynch KG, Metzger DS. Acceptability of audio computer-assisted self-interview (ACASI) among substance abusers seeking treatment in Rio de Janeiro, Brazil. *Drug Alcohol Depend*. 2006; 82(Suppl 1):S103–7. [PubMed: 16769438]
32. Hewett PC, Mensch BS, Ribeiro MC, et al. Using sexually transmitted infection biomarkers to validate reporting of sexual behavior within a randomized, experimental evaluation of interviewing methods. *Am J Epidemiol*. 2008; 168:202–11. [PubMed: 18525081]
33. Mensch BS, Hewett PC, Gregory R, Helleringer S. Sexual behavior and STI/HIV status among adolescents in rural Malawi: an evaluation of the effect of interview mode on reporting. *Stud Fam Plann*. 2008; 39:321–34. [PubMed: 19248718]
34. Jaya, Hindin MJ, Ahmed S. Differences in young people's reports of sexual behaviors according to interview methodology: a randomized trial in India. *Am J Public Health*. 2008; 98:169–74. [PubMed: 18160677]
35. Ghanem KG, Hutton HE, Zenilman JM, Zimba R, Erbeling EJ. Audio computer assisted self interview and face to face interview modes in assessing response bias among STD clinic patients. *Sex Transm Infect*. 2005; 81:421–5. Accepted 4 November 2012. [PubMed: 16199744]

Figure 1.

Enrolment of participants FTF = face-to-face; ACASI = audio computer-assisted survey instruments

Figure 2.
Concordant responses between partners (n = number of partnerships)

Table 1
Sociodemographic information for the participants by gender, methodology and clinic site

	Conceição Hospital		Femina Hospital		Total		χ^2	P value
	N (%)		N (%)		N (%)			
	ACASI	FTF	ACASI	FTF	ACASI	FTF		
Pregnant women	n = 135	n = 155	n = 143	n = 216	n = 282	n = 371		
Mean age (years)	29	28.5	29.7	30.4	29.3	29.6		0.609
White	100 (72)	114 (74)	101 (71)	158 (73)	202 (72)	272 (73)		0.613
Married or living with partner	117 (85)	142 (92)	124 (87)	208 (96)	241 (86)	350 (94)		0.000*
Mean years of school	10.2	8.7	9.3	9.2	9.7	9.0		0.089
Employed (yes)	70 (51)	72 (46)	76 (53)	100 (46)	147 (52)	172 (46)		0.132
Household income (Brazilian Reals)	1692	1319	2180	1482	1939	1414		0.144
Gravidity	2.7	2.9	2.7	3.1	2.7	3.0		0.827
Male partners	n = 73	n = 81	n = 49	n = 91	n = 122	n = 172		
Mean age (years)	33	31.6	31.9	32.6	32.7	32.1		0.677
White	62 (85)	66 (81)	33 (58)	66 (73)	95 (73)	132 (76)		0.522
Married/living with partner	76 (93)	78 (95)	51 (89)	88 (97)	118 (91)	166 (96)		0.065
Mean years of school	9.3	8.0	10.5	8.6	9.8	8.3		0.036*
Employed (yes)	67 (92)	73 (89)	50 (88)	80 (89)	117 (90)	153 (89)		0.770
Household income (Brazilian Reals)	1744	1421	1577	1702	1671	1569		0.456

ACASI = audio computer-assisted survey instrument; FTF = face-to-face

* P value <0.05

Table 2
Sexual behaviours and substance use activity comparing ACASI to FTF interview methodologies

	ACASI N (%)	FTF N (%)	P value	Missing values N	
				ACASI	FTF
Pregnant women	N = 282	N = 371			
Mean age of sexual debut	16.2	15.9	0.29	4	0
>5 sex partners (lifetime)	101 (36)	106 (29)	0.036*	4	0
Condom use during pregnancy (never)	189 (68)	301 (83)	0.000*	6	10
Vaginal sex during pregnancy (yes)	259 (93)	354 (95)	0.215	4	0
Oral sex during pregnancy (yes)	118 (42)	128 (35)	0.039*	4	0
Anal sex during pregnancy (yes)	59 (21)	61 (16)	0.121	4	0
Outside sexual partner (yes)	19 (7)	17 (5)	0.218	4	1
Partner HIV tested (no/don't know)	172 (62)	211 (57)	0.221	3	0
Intravenous drug use (current/past)	13 (5)	0 (0)	0.000*	3	0
Alcohol use during pregnancy (yes)	36 (13)	30 (8)	0.044*	4	7
Cigarette use during pregnancy (yes)	64 (13)	59 (16)	0.030*	4	12
Crack cocaine use (yes)	3 (1)	1 (0)	0.323	4	11
Male partners	N = 130	N = 173			
Circumcised	10 (8)	9 (5)	0.474	9	1
>5 sex partners (lifetime)	93 (72)	122 (71)	0.908	9	1
Condom use during pregnancy (never)	83 (67)	148 (86)	0.000*	9	1
Vaginal sex during pregnancy (yes)	115 (88)	169 (98)	0.000*	9	1
Oral sex during pregnancy (yes)	64 (49)	65 (38)	0.042*	9	1
Anal sex during pregnancy (yes)	44 (34)	44 (25)	0.110	9	1
Outside sexual partner (yes)	28 (22)	28 (22)	0.029*	9	1
Intravenous drug use (current/past)	6 (5)	3 (2)	0.179	9	1
Alcohol use (yes)	67 (52)	80 (46)	0.361	9	1
Cigarette use (yes)	35 (27)	53 (31)	0.404	9	1
Crack cocaine use (yes)	3 (2)	4 (2)	1.000	9	1

ACASI = audio computer-assisted survey instrument; FTF = face-to-face

* P value <0.05

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Crude and adjusted odds ratios for specific HIV risk factors, Hospital Nossa Senhora da Conceição

Table 3

	Alcohol use		Cigarette use		Had outside partnership/affair		No condom use	
Pregnant women								
	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)
ACASI	1.68 * (1.01–2.81)	1.42 [†] (0.83–2.43)	1.54 * (1.04–2.29)	1.41 ^{††} (0.93–2.12)	1.52 (0.78–2.99)	1.22 ^{†††} (0.61–2.46)	0.43 * (0.30–0.63)	0.47 * ^{††††} (0.32–0.69)
White	0.86 (0.49–1.49)	1.06 [‡] (0.59–1.91)	0.50 * (0.33–0.76)	0.50 * ^{‡‡} (0.33–0.77)	0.86 (0.41–1.78)	0.92 ^{‡‡‡} (0.44–1.94)	1.24 (0.83–1.85)	1.17 ^{‡‡‡‡} (0.77–1.78)
9 years school	0.84 (0.50–1.40)	0.66 [‡] (0.39–1.13)	1.74 * (1.17–2.59)	1.87 * ^{‡‡} (1.24–2.84)	0.72 (0.36–1.43)	0.70 ^{‡‡‡} (0.35–1.41)	0.77 (0.53–1.11)	0.81 ^{‡‡‡‡} (0.55–1.18)
Married	0.71 (0.32–1.56)	0.90 [§] (0.39–2.07)	0.68 (0.37–1.27)	0.76 ^{§§} (0.39–1.45)	0.32 * (0.14–0.73)	0.35 * ^{§§§} (0.15–0.82)	1.91 * (1.07–3.40)	1.50 ^{§§§§} (0.82–2.72)
Parity (>2)	1.60 (0.94–2.72)	1.35 [‡] (0.77–2.37)	2.13 * (1.41–3.21)	2.10 * ^{‡‡} (1.37–3.21)	1.13 (0.58–2.21)	1.14 ^{‡‡‡} (0.57–2.26)	0.86 (0.59–1.24)	0.83 ^{‡‡‡‡} (0.56–1.22)
Male partners								
	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)
ACASI	1.24 (0.78–1.95)	1.25 [†] (0.78–2.00)	0.81 (0.49–1.34)	0.77 ^{††} (0.46–1.29)	1.97 * (1.06–3.67)	1.84 ^{†††} (0.96–3.52)	0.33 * (0.19–0.58)	0.33 * ^{††††} (0.18–0.58)
White	0.77 (0.46–1.29)	0.69 [‡] (0.40–1.20)	0.71 (0.41–1.23)	0.67 ^{‡‡} (0.38–1.20)	0.89 (0.45–1.75)	0.77 ^{‡‡‡} (0.37–1.58)	1.59 (0.87–2.90)	1.59 ^{‡‡‡‡} (0.82–3.04)
9 years school	1.26 (0.81–1.97)	1.23 [‡] (0.77–1.97)	1.98 * (1.20–3.28)	1.86 * ^{‡‡} (1.11–3.13)	1.31 (0.72–2.39)	1.36 ^{‡‡‡} (0.72–2.56)	0.91 (0.53–1.59)	0.82 ^{‡‡‡‡} (0.47–1.46)
Married	0.54 (0.21–1.41)	0.54 [§] (0.20–1.45)	0.90 (0.33–2.45)	0.95 ^{§§} (0.34–2.64)	0.69 (0.22–2.17)	1.27 ^{§§§} (0.33–4.90)	5.04 * (1.9–13.38)	4.42 * ^{§§§§} (1.61–12.13)

ACASI=audio computer-assisted survey instrument

* P value <0.05

[†] Adjusted for site marital status and smoking[‡] Adjusted for site, interview method, marital status and cigarette use[§] Adjusted for site, interview method and cigarette use^{††} Adjusted for site, marital status and alcohol use^{‡‡} Adjusted for interview method, site, marital status and alcohol use^{§§} Adjusted for interview method, site and alcohol use^{†††} Adjusted for site, marital status and condom use pregnancy^{‡‡‡} Adjusted for interview method, marital status and no condom use during pregnancy

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Adjusted for interview method, site and no condom use during pregnancy
Adjusted for site, marital status and alcohol use
Adjusted for interview method, marital status and alcohol use
Adjusted for interview method, site and alcohol use