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Reducing sexual risk taking behaviors among adolescents who engage in transactional sex in post-conflict Liberia

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Abstract

Transactional sex (TS) has been correlated with HIV/STD infection, pregnancy, early marriage, and sexual violence in sub-Saharan Africa (SSA). Few Western-based HIV prevention programs adapted for SSA have examined intervention impacts for this group. This article examines whether an HIV prevention intervention, delivered to sixth-grade students in Liberia (age range 14–17) and found to increase condom use and other mediators for the larger sample, significantly impacted sexual behaviors and mediators for those who engaged in TS. Using an attention-matched, group-randomized controlled design, four matched pairs of elementary schools in Monrovia, Liberia, were randomly assigned to an adapted eight-module HIV prevention or a general health curriculum. Nine-month impacts of the intervention on sexual risk behaviors and mediators for those who engaged in TS, when compared with other study participants, are presented. Twelve percent of our sample of sixth graders ($n = 714$) ever engaged in TS. The majority of females reported being promised something in exchange for sex (52%), whereas the majority of males (52%) reported being both the giver and recipient of gifts in exchange for sex. Compared with other students, those who engaged in TS reported greater increases in the number of sex partners, reported greater frequency of sexual intercourse, were more likely to try to get pregnant or someone else pregnant, and reported greater reductions in protective sexual attitudes and HIV risk perception at the nine month follow-up, in both the intervention and the control groups. Our intervention, although successful for the general in-school adolescent sample, did not impact risk behaviors or mediators for adolescents who engaged in TS. Future research should explore the complex sexual economy in which TS is embedded and consider adapting HIV prevention interventions to the needs of this high-risk group.

Keywords

adolescents; AIDS; Liberia; prevention; transactional sex

Introduction

Throughout sub-Saharan Africa (SSA), transactional sex (TS) occurs to meet varied needs including cash, goods (Atwood et al., 2011; Hunter, 2002; Jones & Norton, 2007; Nyanzi, Pool, & Kinsman, 2001), and work advancement (Hunter, 2002; Nyanzi et al., 2001) or to

gain social status (Atwood et al., 2011). Power differentials leave women little room to refuse sex or negotiate condom use and can lead to sexual violence, early pregnancy, and HIV infection (Cote et al., 2004; Luke, 2003; Nacher et al., 2010; Swindler & Watkins, 2007).

During Liberia's two-decade civil war, women exchanged sex for protection, while thousands were held as sex slaves (Barbiero & Barh, 2007). A culture of TS persists in Liberia's post-conflict environment (Atwood et al., 2011; Barbiero & Barh, 2007; National Strategic Framework [NSF], 2010). In focus groups, Liberian adolescents report that young people engage in TS to obtain Western commodities and goods for the family or to achieve higher status, and these encounters often occur between young females and older, more affluent males (Atwood et al., 2011). Unprotected sex is common because implied in these encounters is an acceptance of male control (Atwood et al., 2011). While school is perceived as protective, many adolescent females engage in TS for school fees and supplies (Atwood et al., 2011).

Western-based HIV prevention programs adapted for SSA prioritize sexual refusal and condom negotiation skills among similarly aged peers over issues related to TS. None have reduced TS among adolescents and few have examined intervention impacts for this potentially high-risk group.

Described elsewhere (Atwood et al., 2012), we delivered a school-based HIV prevention intervention to sixth-grade students ($n = 820$) in Liberia, adapted from Jemmott's *Making Proud Choices* (Jemmott, Jemmott, & Fong, 1998). The age range of sixth graders in the sample was 14–18, consistent with national demographic surveys (Liberia Institute of Statistics and Geo-Information Services [LISGIS], 2008). The intervention significantly impacted protective peer norms and positive condom attitudes and increased frequency of condom use at the nine month follow-up (Atwood et al., 2012).

In this article, we examine whether our intervention significantly impacted mediators and sexual risk behaviors among those who engaged in TS and whether the TS group reported less protective mediators and greater sexual risk behaviors at the nine month follow-up when compared with other study participants.

Study design

Using an attention-matched, group-randomized controlled trial, four matched pairs of elementary schools in Monrovia, Liberia, were randomly assigned to an adapted eight-module HIV prevention or general health curriculum. Public school students were of similarly low socioeconomic background and primarily Christian (LISGIS, 2008). School size, student age, teacher/student ratio, and gender distribution were used for constructing matched pairs of schools. Each pair was selected from within one of Monrovia's four school zones (Atwood et al., 2012). No significant differences were found for age, gender, or religious affiliation among respondents in the intervention compared with the comparison schools (Atwood et al., 2012).

Intervention and comparison curricula

Intervention schools received the adapted HIV Prevention program. Based on Social Cognitive Theory (Bandura, 1986; 1997) and the Theory of Reasoned Action (Ajzen & Fishbein, 1980), the program promotes positive condom attitudes, condom use skills, and self-efficacy related to condom negotiation and sexual refusal (Atwood et al., 2012; Jemmott et al., 1998).

The comparison schools received a General Health Curriculum that includes preventive information on malaria, tuberculosis, and worm infestations and facts about HIV transmission. It lacks an overarching behavioral theory or skill building (Atwood et al., 2012).

Recruitment

Two sixth-grade classes from each intervention and control school were randomly selected to receive the designated curriculum (approximately $n = 100$ per school) yielding 812 participants. Active parental consent forms were completed (approved by the United States and the University of Liberia's Institutional Review Boards). Consent rates were 83% across condition.

Class and survey administration

Health educators delivered the curriculum during health class (Atwood et al., in press). Participants completed baseline, three- and nine-month follow-up surveys and received US \$2 for each survey. The follow-up rate for the nine-month survey was 88%.

Measures

This article presents nine-month impacts of the intervention on sexual behaviors and mediating variables among those who engaged in TS when compared with other study participants. Two TS questions were asked at the nine-month survey: (1) "Have you ever had sex with someone because he or she promised to give you something that you needed or wanted? (Yes vs. No)" and (2) "Have you ever had sex with someone when you promised to give that person something that he or she needed or wanted? (Yes vs. No)." The two items were examined separately and then collapsed representing ever engaging in TS (regardless of whether you promised something or were promised something in exchange for sex). Of the 814 participants in the study, 714 participants responded to questions about TS (12% of sample were missing on this question). The analysis is limited to these 714 participants.

We assessed the impact of the intervention on sexual behaviors. Sexual behavior questions asked about past three-month behaviors at baseline and nine months including (1) condom frequency (Likert scale ranging from "never" to "every single time"), (2) sex partnerships (categorical responses ranging from none to 10 or more), (3) frequency of sexual intercourse (categorical response ranging from 0 to 10 or more times), (4) trying to get pregnant or someone else pregnant, and (5) ever having anal sex in one's lifetime.

We also examined intervention impacts on theoretically derived mediating variables. The mediators are presented below along with their internal reliabilities (Cronbach α) among our sample.

1. *AIDS knowledge.* AIDS knowledge was an 11-item AIDS Knowledge Scale with higher scores representing greater AIDS knowledge ($\alpha = 0.60$) (Jemmott et al., 1998).
2. *Self-efficacy.* Separate self-efficacy scales examined (a) *sexual refusal self-efficacy* assessing confidence in refusing sex ($\alpha = 0.79$) (six-item scale modified from Donohew et al., 2000); (b) *condom use self-efficacy* assessing confidence in using condoms ($\alpha = 0.60$) (four-item scale; Brien, Thombs, Mahoney, & Wallnau, 1994); and (c) *condom negotiation self-efficacy*, measuring confidence to discuss condom use with sex partners ($\alpha = 0.77$) (five-item scale, Zimmerman et al., 2003). Response items ranged from "1" = "I am sure I can't do this" to "5" = "I am sure I can do this." Higher scores represented greater self-efficacy for each behavior.

3. *Condom attitudes.* Condom attitudes were assessed using a five-item outcome expectancy scale ($\alpha = 0.86$) (adapted from Jemmott et al., 1998). Items included “Using condoms during sex would make me feel safer” with response categories ranging from “1” = “Agree a lot” to “5” = “Disagree a lot.” Scores were reverse coded with higher scores representing more positive condom attitudes.
4. *Perceived HIV risk.* Perceived HIV risk was assessed using a six-item scale ($\alpha = 0.82$) (modified from Witte, Girma, & Girgre, 2002). Items include “People my age are too young to get HIV.” Response categories ranged from “1” = “Agree a lot” to 5 = “Disagree a lot” with higher scores representing greater perceived HIV risk.
5. *Sexual attitudes.* Attitudes toward sexual permissiveness was assessed using a sexual attitude scale ($\alpha = 0.82$) (modified from Basen-Engquist et al., 1999). Sample items included “I believe people my age should get as much sexual experience as they can.” Response categories ranging from “1” = “Agree a lot” to “5” = “Disagree a lot” with higher scores representing protective sexual attitudes.

Methods

Our analysis examined two questions: (1) whether youth who engaged in TS reported greater sexual risk behaviors and less protective mediators over time when compared with others and (2) whether the intervention differentially impacted mediators and sexual behaviors for those who had engaged in TS relative to those who had not engaged in TS. Our sample was stratified into three subgroups based on the responses to the nine-month survey: (1) those who ever had TS, (2) those who had sex only, but not TS (SO), and (3) those who never had sexual intercourse (NS). We compared change scores for our mediators and sexual behaviors for the three subgroups within the intervention and control groups using Fisher LSD tests. Although some outcomes are dichotomous, dichotomous variables assume a normal distribution under the central limit theorem and tests using a logit model often produce results similar to a model assuming normally distributed dependent measures (Hannan & Murray, 1996).

We performed regression analyses examining whether changes in our mediators and behavioral outcomes, represented by difference scores defined as time 2 (nine months) – time 1 (baseline) were predicted by intervention status, a contrast representing those not sexually active versus all others, a contrast representing those who had engaged in TS versus all others, the orthogonal interactions of the latter two variables with intervention status, and the covariates of gender (male = 1 and female = 0) and age. We reverse coded the dummy variables to represent sexually active (i.e. 1 = TS or sexually active only) versus non-sexually active (0). Although difference scores have raised criticisms (Cronbach & Furby, 1970), this strategy provides statistical significance tests comparable to repeated measures ANOVA (Huck & McLean, 1975). The condom use analysis was restricted to the sexually active at the nine-month follow-up. Dichotomous outcomes were examined using a regression approach where time 2 standing was regressed on the prior predictors, as well as baseline standing on the outcome.

Findings

Descriptive findings

Fifteen percent of the sample reported ever engaging in TS at the nine-month follow-up survey ($n = 123$) (Table 1). Among those who engaged in TS, 41% were female. Among this group of females, 52% were “promised something” in exchange for sex, 26% reported that they had been “promised something” and that they “promised something to someone else,” while 22% reported only “promising something to someone else” in exchange for sex.

Among males who engaged in TS, 52% reported that they had engaged in both behaviors, while 30% reported only “promising something” to others while 18% reported being “promised something by someone else” in exchange for sex.

Stratifying the sample by those who ever engaged in TS (including all respondents who promised something or were promised something in exchange for sex) ($n = 123$), those who ever had sex but not TS (SO) ($n = 216$), and those who did have sex (NS) ($n = 375$), we found no significant differences in demographic characteristics across subgroups. Participants were primarily Christian, on average 16 years of age and 60% were male. A greater percentage of the SO and TS group reported having a boyfriend/girlfriend than the NS group (48%, 42%, and 32%, respectively, $p < 0.001$). Limiting the analysis to those who had sex, the TS group initiated sex at a younger age than the SO group (chi square = 13.9, $p < 0.001$) (Table 1).

Change in mediators

Using Fisher LSD test we compared the differences in change scores for our mediating variables from baseline to the nine-month follow-up, comparing the TS, SO, and NS groups. Analyses were conducted separately for intervention and control participants. Among the intervention group, the TS group had significant differences in change scores in the negative direction for sexual refusal self-efficacy (3.84–3.51) and HIV risk perception (3.13–2.93) when compared with SO group ($p < 0.05$) and the NS group ($p < 0.05$) whose scores increased in the protective direction (Table 2). In addition, the TS group saw no change in protective sexual attitudes at the nine-month follow-up (2.38–2.39) which differed significantly from the SO group who reported an increase in protective sexual attitudes (2.17–2.65, $p < 0.05$) (Table 2).

In the comparison group, there were no significant differences in change scores on most mediating variables when comparing the three subgroups. However, the SO group reported an increase in protective sexual attitudes (2.41–2.97) which differed significantly from the TS group ($p < 0.05$) who reported no significant change in protective sexual attitudes (2.49–2.47) (Table 2). To our surprise, positive condom attitudes decreased in the TS and SO groups in both the intervention and control conditions.

Change in sexual behaviors

Using the Fisher LSD test, we found that in intervention condition, the TS group had significant differences in change scores for number of sex partners (0.14–0.50) and frequency of sexual intercourse (0.13–0.48) and were more likely to try to get pregnant (or someone pregnant) (7–19%) when compared with those in the SO and NS groups ($p < 0.05$) (Table 2). We found similar differences in change scores for these sexual behaviors in the control condition (Table 2). Limiting the analysis to those who had sex, there were no significant differences in condom use frequency among TS and SO groups in both the intervention and the control conditions (Table 2).

Multivariate findings

We ran separate regression models to examine whether changes in our mediators and behavioral outcomes were associated with ever engaging in TS. Change was defined by differences in scores from baseline to the nine-month follow-up. The regression models included intervention status and categorical dummy variables representing the TS group, the SO group, and the reference group (NS group). An orthogonal interaction term was created with our dummy variables and intervention status to assess whether the intervention had a differential impact on change scores for those who engaged in TS when compared with all others. In all regression models we controlled for gender (male = 1 and female = 0) and age.

Our regression models corroborated some of our preliminary findings. Our findings suggest that the TS group, when compared with all other participants at the nine-month follow-up, had less protective sexual attitudes ($\beta = -0.50, p < 0.01$), reduced perceived risk of HIV infection ($\beta = -0.36, p < 0.05$), increased number of sex partners in the past three months ($\beta = 0.33, p < 0.01$), and increased frequency of sexual intercourse in the past three months ($\beta = 0.27, p < 0.01$). The TS group were more likely to try to get/or to get someone else pregnant in the past 3 months (OR = 2.15, $p < 0.01$) and to ever having anal sex (OR = 1.17, $p < 0.01$) than the remainder of the sample (Table 3).

There was little evidence to suggest that both intervention status and having engaged in TS jointly moderated changes over time in our outcomes of interest. Being in the intervention did not differentially affect the outcomes for those who engaged in TS when compared with all others. The one effect that did emerge was for sexual refusal self-efficacy. In the intervention condition, the SO and NS groups had modest gains over time in sexual refusal self-efficacy skills while the TS group had a decrease over time. Those in the control group exhibited small changes over time that were not different as a function of sexual experience group.

It is also possible that those who engaged in TS attended fewer sessions accounting for outcome differences. To address this possible confounder, we explored whether lower intervention dosage is associated with lower intervention effectiveness. A one-way ANOVA with Fisher LSD contrasts was performed on the number of days participants were exposed to the intervention using our sexual experience level trichotomy [i.e. not sexually active (dosage $M = 6.68$), sexually active but no TS (dosage $M = 6.27$), and TS (dosage $M = 6.24$)] as the independent measure. The omnibus test did not suggest a difference between any group and the grand mean, $F(2,405) = 1.88, p = 0.15$. No groups differed significantly ($p < 0.05$) from one another, suggesting that attendance was unlikely to account for differences in our outcomes across subgroups.

Limitations

Our study was limited to eight schools, reducing generalizability. TS measures were obtained at the nine-month follow-up, therefore we could not examine the impact of the intervention on reducing TS. The data were self-report posing the potential for survey response bias. Parental consent requirements may have produced selection bias: youth who were more likely to engage in TS or other high-risk sexual behaviors may have not returned parental consents.

Discussion

The TS group, when compared with other student participants, reported greater increases in sex partnerships and frequency of sex and greater reductions in protective sexual attitudes and HIV risk perception at the nine-month follow-up, in both the intervention and control groups. The TS group was more likely to try to get pregnant (or get someone pregnant) and was more likely to ever engage in anal sex. Finally, the TS group in the intervention condition reported a reduction in sexual refusal skills over time that was larger than reductions in the SO and NS intervention groups; however, comparable differences were not found in the control condition.

Our intervention focused on strengthening negotiation and refusal skills among similarly aged peers in non-TS encounters but did not address TS. Some interventions in SSA have sought to reduce mediators among those who engage in TS but with little success. An HIV prevention program in Ghana included a lesson about “sugar daddies” and taught girls vocational skills; however, no reductions in mediators were found for the TS group (Fiscian,

Obeng, Goldstein, Shea, & Turner, 2009). Other studies have addressed TS in community-based studies (Jewkes et al., 2006; 2008) but with different age groups, finding reductions in TS among adult males only (Jewkes et al., 2008).

HIV prevention interventions should address the structural needs that motivate engagement in TS and the pressures to offer material goods in exchange for sex. An intervention in Kenya provided school supports for orphans resulting in an increased in-school attendance and a reduction in early marriage (Hallfors et al., 2011). Similar approaches could be adapted for TS. Fostering greater gender equity (Jewkes et al., 2006) or reducing the number of TS partners and age discordance (Wamaji, Fenwick, Urassa, Zaba, & Stones, 2010; Wamaji, Wight, Plummer, Mshana, & Ross, 2010) could reduce TS behaviors and associated risks. Future research should explore cultural differences in the norms supporting TS and the sexual economies in which TS is embedded to guide intervention development.

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References

- Ajzen, I.; Fishbein, M. Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice-Hall; 1980.
- Atwood K, Kennedy S, Barbu E, Nagbe W, Seekey W, Sirleaf P, Sosu F. Transactional sex among youth in post conflict Liberia. *Journal of Health, Population and Nutrition*. 2011; 29(2):113–122.
- Atwood KA, Kennedy SB, Shamblen S, Teglee J, Shannon F. Impact of schoolbased HIV prevention program in post-conflict Liberia. *AIDS Education and Prevention*. 2012; 24(1):67–76.
- Bandura, A. Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice Hall; 1986.
- Bandura, A. Self-efficacy: The exercise of control. New York, NY: W.H. Freeman; 1997.
- Barbiero, VK.; Barh, SB. HIV situations and response assessment USAID/Monrovia. Monrovia: QED Group LLC, USAID; 2007.
- Basen-Engquist K, Masse LC, Coyle K, Kirby D, Parcel GS, Banspach SW, Nodora J. Validity of scales measuring the psychological determinants of HIV/STD-related risk behavior in adolescents. *Health Education Research*. 1999; 14(1):25–38. [PubMed: 10537945]
- Brien TM, Thombs DL, Mahoney CA, Wallnau L. Dimensions of self-efficacy among three distinct groups of condom users. *Journal of American College of Health*. 1994; 42:167–174.
- Cote A, Sobela F, Dzokoto A, Nzambi K, Asamoah-Adu C, Labbe A, Pépin J. Transactional sex is the driving force in the dynamics of HIV in Accra, Ghana. *AIDS*. 2004; 18:917–925. [PubMed: 15060439]
- Cronbach LJ, Furby L. How should we measure change – or should we? *Psychological Bulletin*. 1970; 74:32–49.
- Donohew L, Zimmerman RS, Cupp PS, Novak S, Colon S, Abell R. Sensation seeking, impulsive decision-making, and risky sex: Implications for risk-taking and design of interventions. *Personality and Individual Differences*. 2000; 28:1079–1091.
- Fiscian VS, Obeng EK, Goldstein K, Shea JA, Turner BJ. Adapting a multifaceted U.S. HIV prevention education program for girls in Ghana. *AIDS Education and Prevention*. 2009; 21(1): 67–79. [PubMed: 19243232]
- Hallfors D, Cho H, Rusakaniko S, Iritani B, Mapfumo J, Halpern C. Supporting adolescent orphan girls to stay in school as HIV risk prevention: Evidence from a randomized controlled trial in Zimbabwe. *American Journal of Public Health*. 2011; 101(6):1082–1088. [PubMed: 21493943]
- Hannan PJ, Murray DM. Gauss or Bernoulli? A Monte Carlo comparison of the performance of the linear mixed-model and the logistic mixed-model analyses in simulated community trials with a

- dichotomous outcome variable at the individual level. *Evaluation Review*. 1996; 20(3):338–352. [PubMed: 10182208]
- Huck S, McLean R. Using a repeated measures ANOVA to analyze the data from a pretest–posttest design: A potentially confusing task. *Psychological Bulletin*. 1975; 82:311–318.
- Hunter M. The materiality of everyday sex: Thinking beyond prostitution. *African Studies*. 2002; 61:99–120.
- Jemmott JB 3rd, Jemmott LS, Fong GT. Abstinence and safer sex HIV risk-reduction interventions for African American adolescents: A randomized controlled trial. *Journal of the American Medical Association*. 1998; 279(19):1529–1536. [PubMed: 9605896]
- Jewkes R, Nduna M, Levin J, Jama N, Dunkle KL, Khuzwayo N, Duvvury N. A cluster randomized-controlled trial to determine the effectiveness of stepping stones in preventing HIV infections and promoting safer sexual behavior amongst youth in rural Eastern Cape, South Africa: Trial design, methods and baseline findings. *Tropical Medicine and International Health*. 2006; 11(1):3–16. [PubMed: 16398750]
- Jewkes R, Nduna M, Levin J, Jama N, Dunkle K, Puren A, Dunwury N. Impact of stepping stones on incidence of HIV and HSV-2 and sexual behaviour in rural South Africa: Cluster randomised controlled trial. *British Medical Journal*. 2008; 337:a506. [PubMed: 18687720]
- Jones S, Norton B. On the limits of sexual health literacy insights from Ugandan school girls. *Diaspora, Indigenous and Minority Education*. 2007; 1(4):285–305.
- Liberia Institute of Statistics and Geo-Information Services (LISGIS), Ministry of Health and Social Welfare, National AIDS Control Program, Macro International INC. *Liberia demographic and health survey 2007*. Monrovia, Liberia: Author; 2008.
- Luke N. Age and economic asymmetries in sexual relationships of adolescent girls in sub-Saharan Africa. *Studies in Family Planning*. 2003; 34(2):67–86. [PubMed: 12889340]
- Nacher M, Vantilcke V, Parriault MC, Melle AV, Hanf M, Labadie G, Couppié P. What is driving the HIV epidemic in French New Guiana? *International Journal of STD and AIDS*. 2010; 21:359–361. [PubMed: 20498108]
- National Strategic Framework on HIV-AIDS II 2010–2014 (NHSF). Republic of Liberia: National AIDS Commission; 2010.
- Nyanzi S, Pool R, Kinsman J. The negotiation of sexual relationships among school pupils in south-western Uganda. *AIDS Care*. 2001; 13(1):83–98. [PubMed: 11177467]
- Swindler A, Watkins SC. Ties of dependency: AIDS and transactional sex in rural Malawi. *Studies in Family Planning*. 2007; 38:147–162. [PubMed: 17933289]
- Wamaji J, Fenwick A, Urassa M, Zaba B, Stones W. “Women’s bodies are shops”: Beliefs about transactional sex and implications for understanding gender power and HIV prevention in Tanzania. *Archives of Sexual behavior*. 2010; 11
- Wamaji J, Wight D, Plummer M, Mshana GH, Ross D. Transactional sex amongst young people in rural Tanzania: An ethnography of young people’s motivation and negotiation. *Reproductive Health Matters*. 2010; 40(1):5–10.
- Witte K, Girma B, Girgre A. Addressing underlying mechanisms to HIV/AIDS preventive interventions for African American adolescents: A randomized controlled trial. *Journal of the American Medical Association*. 2002–2003; 279:1529–1536.
- Zimmerman, RS.; Feist-Price, S.; Atwood, K.; Cupp, PK.; Clay, C.; Dudley, M. Paper presented at the 2003 National HIV Prevention Conference. Atlanta, Georgia: 2003. Alcohol use and HIV prevention with three high-risk groups of adolescents.

Table 1Baseline characteristics of the sample population ($N = 714$).

	NS n (%)	SO n (%)	TS n (%)	Chi square
n	375 (44)	216 (26)	123 (15)	
Female	158 (42)	87 (40)	50 (41)	
Promised something by someone for sex	–	–	26 (52)	13.9**
Promised something to someone else for sex	–	–	11 (22)	
Promised and were promised something for sex			13 (26)	
Male	217 (58)	129 (60)	73 (59)	
Promised something by someone for sex	–	–	13 (18)	
Promised something to someone else for sex	–	–	22 (30)	
Promised and were promised something for sex			38 (52)	6.7*
Boyfriend/girlfriend	121 (32)	104 (48)	51 (42)	16.3**
Religion				
Christianity	333 (88)	190 (88)	109 (89)	
Islam	29 (8)	20 (9)	11 (9)	
Other	3 (1)	–	1 (1)	
None	10 (3)	6 (3)	2 (1)	
Age at first sex	–			
<11		6 (3)	13 (11)	13.9**
11–12		15 (7)	16 (14)	
13–14		30 (14)	26 (23)	
15–17		157 (76)	60 (52)	
Total		208 (100) ^a	115 (100) ^a	
	Mean (SD)	Mean (SD)	Mean (SD)	
Age	16.1 (1.8)	16.6 (1.6)	16.4 (1.7)	

Notes: NS, never engaged in sex at the nine-month follow-up survey; SO, ever engaged in sex but not transactional sex at the nine-month follow-up; TS, ever engaged in transactional sex at the nine-month follow-up survey.

^aMissing $n = 8$.

**
 $p < 0.001$;

*
 $p < 0.05$.

Table 2

Piecemeal comparison of changes over time by sexual experience and intervention status.

	N	Time	Comparison				Intervention			
			NS	SO	TS	93	NS	SO	TS	104
Condom self-efficacy		1	3.20	3.60	3.31	3.31	3.36	3.52	3.65	3.65
		2	3.37	3.85	3.37	3.37	3.54	3.89*	3.65	3.65
Condom negotiation self-efficacy		1	3.90	4.09	3.85	3.85	3.75	4.09	3.91	3.91
		2	3.72	3.93	3.65	3.65	3.79	4.08	3.76	3.76
Sexual refusal self-efficacy		1	3.93	3.83	3.46	3.46	3.60	3.60	3.84	3.84
		2	3.62*	3.74	3.43	3.43	3.62 ^d	3.73 ^c	3.51 ^{de} *	3.51 ^{de} *
Sex attitudes		1	2.76	2.41	2.49	2.49	2.74	2.17	2.38	2.38
		2	3.13*	2.97 ^b *	2.47 ^b	2.47 ^b	3.04*	2.65 ^e *	2.39 ^e	2.39 ^e
Positive condom attitudes		1	3.67	3.88	3.90	3.90	3.78	4.08	4.09	4.09
		2	3.36*	3.54*	3.63*	3.63*	3.51	3.77*	3.72*	3.72*
Perceived risk of HIV infection		1	3.43	3.57	3.24	3.24	3.12	3.10	3.13	3.13
		2	3.55	3.70	3.20	3.20	3.40 ^d *	3.45 ^e *	2.93 ^{de}	2.93 ^{de}
HIV knowledge		1	4.79	5.09	5.02	5.02	4.14	4.49	4.15	4.15
		2	4.87	4.92	4.67	4.67	4.58	4.28	3.90	3.90
Number of sex partners in 3 months		1	0.00	0.33	0.22	0.22	0.03	0.28	0.14	0.14
		2	0.01 ^a	0.43 ^b	0.53 ^{ab} *	0.53 ^{ab} *	0.00 ^d	0.29 ^c	0.50 ^{de} *	0.50 ^{de} *
Number of sex occurrences in 3 months		1	0.00	0.32	0.18	0.18	0.01	0.27	0.13	0.13
		2	0.01 ^a	0.48 ^b	0.52 ^{ab} *	0.52 ^{ab} *	0.00 ^d	0.35 ^c	0.48 ^d *	0.48 ^d *
Anal sex ever		1	1%	4%	7%	7%	2%	4%	5%	5%
		2	1% ^a	4% ^b *	14% ^{ab} *	14% ^{ab} *	2% ^d	6% ^c *	21% ^{de} *	21% ^{de} *
Trying to get pregnant		1	1%	1%	2%	2%	3%	6%	7%	7%
		2	1% ^a	2% ^b	19% ^{ab} *	19% ^{ab} *	2% ^d	3% ^c *	19% ^{de} *	19% ^{de} *
N		–	130	91	–	–	142	102		
Condom use frequency		1	–	2.73	2.81	2.81	–	2.85	2.40	2.40

	Comparison			Intervention		
	NS	SO	TS	NS	SO	TS
<i>N</i>	144	132	93	122	146	104
Time	2	–	2.97	2.53*	–	2.92
						2.63

Notes: Values sharing a common letter have change scores (i.e. time 2 – time 1) that differ significantly, $p < 0.05$, using Fisher LSD tests.

* Indicates that the value differs from the baseline value. The four variables that were dichotomous in nature (i.e. those denoted by *a*%) were only examined at time 2.

The question, “Have you ever had sex (your penis in a girl’s vagina or a boy’s penis in your vagina)?” was used to classify people as ever having had sex at the nine-month follow-up. Responses about past three-month sexual behavior including frequency of sex and number of sex partnerships inquired more generically about “sex.” respondents may have defined sex as oral, anal, or vaginal sex in these items. NS, never engaged in sex at the nine-month follow-up survey; SO, ever engaged in sex but not transactional sex at the nine-month follow-up; TS, ever engaged in transactional sex at the nine-month follow-up.

Table 3

Unstandardized regression coefficients (with standardized coefficients) and statistical significance for change over time as a function of sexual experience and intervention status.

	Intercept	Intervention	SO	TS	SO × intervention	TS × intervention	Age	Male
Condom self-efficacy	1.24 (0.00)*	0.07 (0.02)	0.13 (0.04)	-0.29 (-0.08)**	-0.04 (-0.01)	-0.08 (-0.03)	-0.06 (-0.07)***	-0.11 (-0.04)
Condom negotiation self-efficacy	0.54 (0.00)	0.19 (0.07)	0.06 (0.02)	-0.12 (-0.04)	-0.09 (-0.03)	-0.04 (-0.02)	-0.04 (-0.06)	0.06 (0.02)
Sexual refusal self-efficacy	-0.57 (0.00)	0.03 (0.01)	0.11 (0.04)	-0.18 (-0.06)	-0.09 (-0.03)	-0.28 (-0.11)*	0.03 (0.05)	0.15 (0.06)
Sex attitudes	-0.87 (0.00)***	-0.05 (-0.02)	0.10 (0.04)	-0.50 (-0.17)**	-0.07 (-0.02)	0.08 (0.03)	0.08 (0.11)**	-0.23 (-0.08)*
Positive condom attitudes	0.21 (0.00)	-0.02 (-0.01)	0.03 (0.01)	-0.05 (-0.02)	0.03 (0.01)	-0.08 (-0.03)	-0.03 (-0.04)	0.10 (0.04)
Perceived risk of HIV infection	-0.16 (0.00)	0.07 (0.03)	-0.01 (0.00)	-0.36 (-0.11)*	0.00 (0.00)	-0.15 (-0.05)	0.03 (0.03)	0.01 (0.00)
HIV knowledge	1.89 (0.00)***	0.44 (0.08)	-0.30 (-0.05)	-0.20 (-0.03)	-0.24 (-0.04)	0.10 (0.02)	-0.12 (-0.08)***	0.29 (0.05)
Number of sex partners in 3 months	0.16 (0.00)	0.03 (0.02)	0.09 (0.06)	0.33 (0.20)**	0.00 (0.00)	0.05 (0.03)	-0.02 (-0.04)	0.10 (0.07)***
Number of sex occurrences in 3 months	0.12 (0.00)	0.00 (0.00)	0.14 (0.10)*	0.27 (0.16)**	-0.02 (-0.01)	0.02 (0.02)	-0.01 (-0.03)	0.07 (0.05)
Anal sex ever ^a	-2.67 (0.07)	0.51 (1.67)	1.49 (4.43)*	1.17 (3.21)**	-0.04 (0.96)	-0.40 (0.67)	-0.11 (0.90)	-0.10 (0.91)
Trying to get pregnant ^a	4.49 (0.01)**	0.06 (1.06)	0.48 (1.61)	2.15 (8.56)**	-0.04 (0.97)	-0.16 (0.85)	0.02 (1.02)	0.33 (1.39)
Condom use frequency ^b	4.60 (0.00)*	0.28 (0.07)	-	-0.38 (-0.10)	-	0.17 (0.04)	-0.27 (-0.23)*	-0.20 (-0.05)

Notes: NS, never engaged in sex at the nine-month follow-up survey; SO, ever engaged in sex but not transactional sex at the nine-month follow-up; TS, ever engaged in transactional sex at the nine-month follow-up survey.

^aThese analyses were performed using logistic regression, so instead of standardized coefficients, odds ratios are listed parenthetically. These analyses examined time 2 standing as the dependent measure and baseline standing (not listed) was also used as one of the predictors.

^bThese analyses were restricted to those who were sexually active at times 1 or 2.

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.10$.