Sexual Risk Behaviors Among Adolescents in Port-au-Prince, Haiti

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Abstract

Engagement in sexual activity among Haitian youth is increasing. The present cross-sectional study examined the independent correlates of sexual risk behaviors among 200 (108 male/92 female) 13–18 year-old adolescents in Port-au-Prince, Haiti using face-to-face interviews. The majority (60.0 %) had engaged in sexual intercourse. Multivariate modeling found males to be 3.52 times more likely to have had sex, 5.42 times more likely to report sexual debut before age 14, 9.75 times more likely to have>1 sexual partner, and 3.33 times more likely to not have used a condom during last sex. Adolescents living with parents, grandparents, aunts or uncles were less likely to report having unprotected sex compared with those without adult family members in the home (AOR range 0.26–0.51). The high prevalence of risky sex among males and the protective influence of stable family cohesiveness have important implications for HIV prevention efforts.

Keywords

HIV/AIDS; Sexual risk; Family structure; Adolescents; Haiti; Natural disaster

Introduction

Haiti has the lowest human development index (HDI) score in the Western Hemisphere, and ranks 161st out of 187 nations [1]. The low HDI, a measure of welfare, education and

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standard of living, is reflected in relatively poor health outcomes. The devastating 2010 earthquake exacerbated the many challenges faced by Haiti's population in the wake of 220,000 deaths, 300,000 injuries and 1.5 million becoming newly homeless [2]. Millions in Haiti have been affected by the loss of family members, forced relocation and physical and economic ruin in the wake of natural disaster [2]. Natural disasters disrupt family and social networks, exacerbate poverty and accentuate individual vulnerability [3].

Outside of Africa, the Caribbean is the most HIV/AIDS affected region of the world [4]. Haiti is home to over half of those living with the disease in the region [4]. As of 2012, an estimated 2.1 % of adults 15–49 years old were living with HIV/AIDS [4]. Certain populations have higher prevalence, including adolescents and young adults many of whom were seen at a voluntary counseling and testing center in Port-au-Prince. At the center, 6.3 % of females and 5.5 % of males were diagnosed with HIV [5]. Of the sample tested at the center, 3.4 % of 13–15 year olds and 4.7 % of 15–19 year olds tested HIV positive [5]. While the clinic population likely has greater risk than the general population, these estimates suggest a high burden of disease among Haitian youth. UNAIDS considers unprotected heterosexual intercourse to be the greatest contributor to the transmission of HIV in the Caribbean [4].

In the past two decades, Haiti has experienced a decline in HIV incidence and HIV/AIDS prevalence [6]. Mathematical modeling suggests that the decline was due to reductions in sexually risky behavior [7]. A review of Haitian HIV/AIDS trends revealed that increased HIV knowledge, condom use, and mutual monogamy have explained this decline [6]. During this same time period, however, the engagement of younger Haitians in riskier sexual behavior appears to have increased [8]. Average age of sexual debut has declined and the proportion of adolescents who were sexually active increased [6]. Moreover, 2010 reports indicate that condom usage in 15–24 year olds remains low, with only 1 in 3 using them among both males and females [4]. A school-based study reported 27 % of Haitian adolescents used a condom at last sexual intercourse and among the sexually active, 40 % had more than two sexual partners [9].

Several correlates of sexual risk behavior and greater risk for sexually transmitted infections (STIs) have been detected. Research suggests contextual factors such as political unrest, violence and economic conditions can influence sexual risk [10–12]. Youth may be particularly vulnerable to having STIs due to heightened sexual curiosity [13]. One study examining individual psychosocial predictors of risky behavior in young people found that impulsive propensity, the tendency to act without forethought, was associated with sexual risk behavior [14]. In a study among Haitian adolescents outside of Port-au-Prince, lower condom use was associated with lower self-efficacy to communicate about HIV/AIDS and perceived barriers to condom use [9].

Demographic factors such as male gender roles, lower education and other low socio-economic status indicators have been associated with riskier sexual behavior [15]. Family structure characteristics including absence of parents, single parent households and being married have also predicted sexual risk [5, 15]. Since the disastrous earthquake in early 2010, there have been no published studies examining the correlates of risky sexual behavior

among Haitian youth, and family structure and social support likely changed following the earthquake [8]. Furthermore, the importance of the factors contributing to risky health attitudes and behaviors among adolescents may have changed since the catastrophe, as many adopted survival responses to the disaster.

The present research examines the importance of demographic, family structure, and psychosocial factors in predicting HIV/STI sexual risk behaviors among Haitian adolescents 13–18 years old. Results from this study may guide the development of successful HIV/STI prevention interventions by identifying high-risk groups and targeting factors associated with risky sexual behaviors. This research aims to draw attention to the vulnerabilities of young Haitians and improve their sexual health outcomes by informing evidence-based interventions.

Methods

Study Design

This cross-sectional interview study, conducted from July through September 2012, included adolescents who live in Port-au-Prince, Haiti. The investigation was based at the Haitian Group for the Study of Kaposi's Sarcoma and Opportunistic Infections (GHESKIO) Centers where interviewers and recruiters were employed.

Participant Selection

Eligible participants were between 13 and 18 years of age and residents of Port-au-Prince. Multiple methods were used for participant recruitment for this convenience sample. Three recruiters who worked for GHESKIO's community youth program offered participation to adolescents involved in the program and others from neighborhoods near the center. The study's interviewers also contributed to enrollment by locating participants for the study in regions of Port-au-Prince familiar to them. Employees did not interview people previously known to them. Participants included adolescents who lived in several neighborhoods of western Port-au-Prince. Western Port-au-Prince was selected based on existing infrastructure and resources that increased the feasibility of conducting this study. All interested adolescents were given a brief description of the nature of the interview, after which interviewers obtained verbal assent before proceeding with the interview.

Data Collection

Creole-speaking interviewers employed by GHESKIO were further trained on administering the questionnaire by the principal investigator. Data were collected during face-to-face interviews in Haitian Creole. A majority (96.0 %) of interviews were done with same sex interviewers. Interviewers informed participants that all responses were to be reported anonymously with no repercussions to the participant. Data collection took place in a closed room to ensure privacy and improve reporting accuracy. To avoid possible interviewee fatigue or discomfort, interviews lasted approximately 40 min and never exceeded 1 h. Participants received compensation for travel, a phone card, and refreshments valued at approximately US $5.00. This compensation was consistent with other research conducted in GHESKIO Centers. Yale University and GHESKIO institutional review boards granted

approval for the study and waived the need for parental and written adolescent consent (HIC Protocol #: 1204010029).

Survey Instrument

The questionnaire principally included scales developed and validated in previous studies and adapted for the Haitian adolescent population as needed. Each question was translated to Haitian Creole by a GHESKIO employee and reviewed by two other Haitian bilingual project staff and back-translated to English to ensure reliability. The instrument was pilot tested with 16 participants to identify confusing or misleading questions and issues related to cultural sensitivity with minor modifications made to the final instrument.

Sexual Behaviors

The four main dependent variables included: (a) sexual behaviors related to sexual initiation; (b) age of sexual debut; (c) lifetime number of sexual partners; and (d) condom use at last intercourse, using questions that had been previously validated among Haitian adolescents [9, 16]. A dichotomous variable indicated whether the participant had ever had sexual intercourse [16]. Adolescents who reported not having had sex were not asked further sexual behavior questions. Questions regarding sex did not differentiate between same sex or opposite sex partners. Participants who had had sex were asked their age at sexual debut, and were also asked their number of lifetime sexual partners. Those who were unsure of the number were asked to provide an estimate [9]. Unprotected sex at last sexual intercourse was coded as a binary response if a condom was used or not used [9].

Demographic and Family Structure

The demographic variables included: sex, age, years of education, religion, parental or guardian education and working status, and the amount of money their family spent weekly at market as a proxy for household income. The family structure data included number of people in the home and with whom the participants lived including mother, father, siblings, grandparents, aunts and/or uncles.

Perceived Social Support (PSS) Assessment

The study included two validated social support scales. The Multi-dimensional Scale of PSS measured structural domains of social support including special person, family and friends, and has been validated for adolescents [17–19]. The Medical Outcome Study (MOS) Social Support Survey assessed functional measures of social support [20]. The MOS survey includes 18 items, each with a 5-point Likert scale ranging from "never" to "all the time" to assess the four functional social support categories: emotional/informational, tangible, affectionate, and positive social interaction. Response options were decreased from seven to five-items on the Likert scale to reduce the complexity for the youth [21].

HIV Knowledge, Perceived Susceptibility, and Self-Efficacy

Knowledge of HIV transmission was measured with the HIV Knowledge Scale that included 11 true/false items [22]. Questions adapted from the AIDS Risk Reduction Model Questionnaire-Revised (ARRM-Q) were used to measure participants' perceived

susceptibility to HIV/AIDS (4 items) and self-efficacy to practice safer sex (7 items) [23]. Both measures used a 4-part response set ranging from "strongly agree" to "strongly disagree" scored from 1 to 4.

Social Desirability

The Marlowe–Crowne social desirability scale (M–C SDS) was used to assess whether participants were responding to socially conform or gain peer approval [24]. The scale was developed to identify participants who choose answers that create a positive or socially acceptable impression. The scale detects and addresses the potential for reporting bias. In this study, a shortened form of the scale was used [25–27]. The psychometric properties of the shortened instrument have been established [27]. The short version consists of 10 dichotomous response items, with total scores ranging from 1 to 10 with 10 indicating more socially desirable responses.

Data Analysis

Means, standard deviations and confidence intervals, stratified by sex, were calculated. Analyses were conducted with four sexual behavior outcomes and the composite measure: (a) ever had sex; (b) age at sexual debut (13 years of age or younger); (c) more than one sex partner; and (d) did not use a condom at last sex. To increase the detection of complex interactions between the four dependent outcomes, a composite sexual risk variable was created, which was dichotomously coded for participants who reported having had sex and also had one or more of the other risk variables. The composite sexual risk outcome excluded participants with one or more missing sexual risk outcomes unless they reported risky behavior for at least one of the other outcomes. Participants who had reported not having had sex were included in the analyses as not having the sexual risk outcome.

Unadjusted and adjusted logistic regression analyses were conducted to identify associations between potential correlates and sexual risk behaviors. Potential correlates included age, sex, family structure, social support, HIV knowledge, perceived HIV susceptibility, self-efficacy and social desirability. All variables that were associated with each independent outcome with $p < 0.20$ were included in the final models constructed for each dependent variable. Using a backward elimination strategy, reduced models were generated that included only covariates with $p < 0.05$. For the composite outcome, effect modification between associated independent variables and both age and sex were assessed with interaction terms. Goodness-of-fit was assessed using the Akaike information criterion (AIC). All data were analyzed using SAS 9.3 (SAS Institute Inc., Cary, NC) software.

Results

Sample Description

Demographic data and other descriptive characteristics of the study sample are presented in Table 1. Of the 200 adolescents recruited (108 male and 92 female; mean age = 15.78, SD = 1.62), almost two-thirds (63.5 %) were in ninth grade or below at the time of the interview. The average number of people living in their home was 6.20 (SD = 2.60) and 38.0 % of the sample lived with both parents, 31.0 % lived with only a mother, 5.0 % with only a father,

14.5 % with only a grandparent, aunt and/or uncle, and 11.5 % with no parent or other adult relative. A majority of participants reported living with siblings (74.5 %) and having at least one parent or guardian who worked (85.3 %).

Males reported significantly greater mean overall structural social support (3.44 vs 3.29; $p <$ 0.001) than their female counterparts (Table 1). Males also reported greater social support from two sources, special persons and school. Though there was no overall difference in functional social support stratified by sex, males reported significantly higher positive mean social interaction scores (3.29 vs 2.82; $p < 0.001$).

Males scored significantly higher in HIV Knowledge (6.49 vs 5.38; $p = 0.001$) and self-efficacy for practicing safer sex (2.50 vs 2.40; $p = 0.033$) than female participants, yet there was no significant difference between the two related to perceived susceptibility to HIV or social desirability ($p > 0.05$).

Sexual Behavior

Sexual intercourse was reported by 120 (60.0 %) participants, with a significantly higher prevalence among males than females (72.2 vs 45.7 %; $p < 0.001$) (Table 1). Among those included in the analyses, the mean age of first intercourse was lower for males than females (13.0 vs 14.5 years; $p = 0.001$).

Among the 120 sexually active participants, the number of sexual partners reported ranged from 1 to 25 and 62.2 % of them reported having had more than one lifetime partner (Table 1). Sexually active males were significantly more likely than females to have more than one sexual partner (72.9 vs 35.7 %; $p < 0.001$). This variable did not differ among the 58 % of the males and females reporting using condom at last sexual intercourse (53.3 vs 67.7 %; $p > 0.05$).

Of the 184 with valid responses for the composite sexual risk outcome, 47.8 % (n = 88) were classified as high-risk on the dichotomous variable. Males, compared to female participants, were significantly more likely to be classified as high-risk (66.7 vs 22.8 %; $p < 0.001$).

Correlates of Sexual Behavior

Male sex correlated with all four of the dependent sexual risk outcomes as well as the newly created composite risk score in the multivariate models. While controlling for other associated variables, males were significantly more likely to have had sex (AOR = 3.52; $p <$ 0.001), early sexual debut between age 10 and 13 years (AOR = 5.99; $p < 0.001$), more than one sexual partner (AOR = 9.75; $p < 0.001$) and not used a condom during last sexual encounter (AOR = 3.33, $p = 0.003$). Using the composite sexually risky indicator, males were 7.00 times more likely to report sexually risky behaviors than females after adjustment ($p < 0.001$). Increasing age was also significantly correlated with having had sex (AOR = 1.56; $p = 0.001$), having had more than one partner (AOR = 1.93; $p < 0.001$) and the composite risk variable (AOR = 1.78; $p < 0.001$). There was no association between age and early sexual debut or condom use, however, at last sexual intercourse (Table 2).

Several family structure variables were associated with sexual risk in the univariate analysis, but failed to remain significant after controlling for other covariates. For example, not living with parents and guardians was associated with having reported more than one sexual partner, but did not remain significant in the adjusted analysis. In the adjusted analysis, family structure variables contributed significantly to not having used a condom during last sexual encounter. Specifically, living with both parents or a mother only, was associated with a 49 and 74 % reduction in risk, respectively, compared to not living with any direct family member (parent, grandparent or aunt/uncle). Having at least one sibling in the home consistently was associated with higher risk and remained in the reduced model for the composite variable (AOR = 3.31; p = 0.012).

Higher levels of emotional social support was associated with lower likelihood of the composite risky sex variable (AOR = 0.43, p = 0.008), while paradoxically two of the PSS domains, social support from family (AOR = 2.03; p = 0.025) and positive social interaction (positive social interaction AOR = 1.47; p = 0.043), both were correlated with higher composite risk.

HIV knowledge scores were positively associated with several of the sexual risk outcomes including the composite sexual risk outcome (AOR = 1.19; p = 0.009), but were not significantly associated with any of the outcomes in the adjusted models. Self-efficacy for using condoms demonstrated an inverse association with early sexual debut in the adjusted model (AOR = 0.20, p = 0.016). Neither perceived susceptibility to HIV infection nor social desirability was significantly associated with any of the sexual risk outcomes. The absence of association between social desirability and the sexual risk outcomes suggests that social desirability did not greatly influence participant responses to sexual risk questions.

Interactions with Age and Sex

There were no significant interactions between any of the correlates with age and sex for the composite risk outcome. As noted earlier, the proportion of female participants with the composite sexual risk outcome was significantly lower overall than the proportion of male participants (22.8 vs 66.7 %; p <0.001). Within each group, there were much greater proportions of older adolescents (16–18) with the higher composite sexual risky outcome than younger (13–15) adolescents (male p = 0.017, female p = 0.001). Males had greater risk among both younger and older adolescents, and older adolescents had increased risk among both males and females. There was no evidence of interaction of independent variables with gender or age in the association with the composite sexual risk variable (p >0.05).

Discussion

To our knowledge, this study is the first to examine the correlates of sexual risk behavior among a sample of adolescents in post-earthquake Port-au-Prince. Research on the effects of natural disasters suggest that there are health and psychological sequelae, in addition to exposure to higher levels of violence in displacement camps, all of which may indirectly influence engagement in risky behaviors [28]. While this was a cross-sectional study, without the ability to assess change in behaviors pre- to post-earthquake, it is possible that

living through the disaster may have indirectly increased engagement in risky behaviors among the participants of this study.

In this sample, a majority (60.0 %) had engaged in sexual intercourse, higher than reported among US high school students (47.4 %) [29]. It is unclear, however, if this represents higher levels of sexual activity than reported in the pre-earthquake era. Concerning was the finding that nearly half (42.3 %) of the sexually active adolescents reported not using a condom at last sexual encounter. The high prevalence of sexual activity and low condom use, especially in a high prevalence HIV and STI setting, calls for multicomponent HIV/STI prevention interventions among young adolescents in the urban center [30]. Multi-component interventions are promoted by UNAIDS and PEPFAR since no one single intervention is likely to be sufficiently effective on its own [31–33]. For adolescents, this may include improving education linked to behavioral interventions, wide-scale condom distribution, population-based HIV, STI and structural interventions focusing on family stabilization.

Our findings that male sex was associated with increased sexual risk was consistent with other studies among Caribbean youth [15]. Another investigation described earlier sexual initiation and high overall sexual activity among male youth in Anguilla [34]. These new data in the post-earthquake era contrast with a previous study conducted among young adults in Port-au-Prince that showed more females than males reported not having used a condom [5]. The differences between these two Port-au-Prince samples may be attributed not to the impact of the destabilizing forces on families and social structure in the wake of the earthquake, but to differences in sample recruitment and eligibility because the pre-earthquake investigation included older participants who were seeking treatment voluntarily in a STI clinic. In the current study, although males scored higher on HIV knowledge, social support and positive social interaction, they had higher overall sexual risk. The authors hypothesize that since males in Haiti have greater access to education, and in general, have more independence to interact with others outside the home there is a higher likelihood of more friendships and support and thus, greater opportunities to engage in risky behaviors, compared to females. The greater overall sexual risk among young males revealed in this study may help inform in the development of targeted interventions and suggests it may be more important to involve male youth earlier than female youth in risk reduction education.

Reasons for the low use of condoms among the entire sample and the increased likelihood that males will use them raises important questions. In a poor setting like Haiti where there is little money, it is likely that despite concerns about HIV/AIDS, STIs or even pregnancy, adolescents may not prioritize safer sex practices. According to Ma-slow's Hierarchy of Needs, basic needs such as food, shelter and safety must be met before secondary needs such as protection from either a disease with delayed repercussions (e.g., HIV) or severe consequences (e.g., STIs or pregnancy) are addressed. Alternatively, it may be that there is low condom availability or access due to stigma about having sex at an early age.

Our findings affirm the need to have central family figures living in the home of adolescents because they appear to contribute to reduced HIV risk-taking. Of note, extended family members, including grandparents, aunts and uncles, may also play an important role in

reducing sexual risk in the absence of mothers and fathers. These findings signal a need for attention toward the sexual health of youth with no parent or guardian in the home. This is particularly salient since 32.5 % of children in households in 2005–2006 in Haiti were considered orphaned or vulnerable according to UNICEF's standards [29]. This proportion markedly increased in the aftermath of Haiti's 2010 earthquake. Although data did not record reasons for not living with parents or guardians, there are likely psychosocial factors moderating the association between family structure and sexual behavior. The results demand further focus on youth not living with parents or grandparents, aunts or uncles.

Emotional social support was consistently negatively correlated with risky sexual behavior. In other words, participants who have someone to listen to their issues and provide advice report more protective sexual behavior. Public health approaches strengthening this type of social support could potentially include support groups and family-based therapy. Positive social interaction, defined as having someone with whom to relax and have fun, was correlated with increased sexual risk behavior [20]. This paradoxical and surprising finding may be because the adolescents at greater risk have fun and relax with their sexual partner and/or their sexual risks have been condoned by peers.

The results from this study strongly support the need for interventions for this vulnerable population, but the findings are not without limitations, in particular the cross-sectional design and relatively small sample size. The cross-sectional design does not allow interpretation of causality nor the comparison of risks in the pre-earthquake era. The sample size precluded a more in-depth exploration of reasons for differences between males and females and possible interactions, including the direct effect of the earthquake on family and social support or disruption of social networks. Moreover, it did not differentiate between same sex and opposite sex partners. Lastly, we believe the data represent the most conservative estimates of sexual risk given that we used face-to-face interviews rather than CASI/CAPI [35]. Nonetheless, the high prevalence of self-reported sex was remarkably high, making this concern about under-reporting of risky behaviors perhaps less worrisome, perhaps because interviews were conducted with same sex interviewers. Despite these limitations, the data revealed associations between sexual risk and gender, family structure and social support that can be utilized for further research and applied interventions.

Future studies should examine the circumstances under which adolescents have sexual intercourse and their reasons for engaging in sexual risk behavior. For example, the reports of sexual debut before 10 years of age may represent voluntary sexual engagement (though it may be argued that children of this age are not mature enough to give consent), sexual abuse, or a misunderstanding of the question. Likewise, participants who reported not having used a condom at last sexual intercourse may have lacked access or education to use condoms, felt inadequate negotiating power, or intentionally neglected to use condoms. The contributors to health risk behaviors in Haiti are likely complicated and associated with other social determinants of poverty, making the development and expansion of effective interventions especially challenging. This study demonstrates the substantive HIV/STI risk and the clear need for public health action to reduce transmission among Haitian youth.

Acknowledgments

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Table 1

Description of the total sample, stratified by gender

Characteristic	Total (N = 200)[a]	Sex		
		Male (N = 108)	Female (N = 92)	p[b]
Mean age (years), SD	15.8 ± 1.62	15.8 ± 1.64	15.8 ± 1.61	0.947
Education level (years)				
9	127 (63.5)	70 (64.8)	57 (62.0)	0.676
>10	73 (36.5)	38 (35.2)	35 (38.0)	
Religion				
Catholic	66 (33.8)	32 (30.8)	34 (37.4)	0.332
Other Christian	129 (66.2)	72 (69.2)	57 (62.6)	
Mean number in the home	6.2 ± 2.60	6.4 ± 2.64	6.0 ± 2.54	0.294
Family structure in the home				
Mother and father	76 (38.0)	40 (37.0)	36 (39.1)	0.215
Mother without father	62 (31.0)	36 (33.3)	26 (28.3)	
Father without mother	10 (5.0)	5 (4.6)	5 (5.4)	
Grandparent/aunt/uncle only	29 (14.5)	11 (10.2)	18 (19.6)	
Do not live with parent or guardian	23 (11.5)	16 (14.8)	7 (7.6)	
Lives with siblings				
Yes	149 (74.5)	85 (78.7)	64 (69.6)	0.140
No	51 (25.5)	23 (21.3)	28 (30.4)	
Working parent or guardian				
Yes	162 (85.3)	91 (89.2)	71 (80.7)	0.098
No	28 (14.7)	11 (10.8)	17 (19.3)	
Has had sex				
Yes	120 (60.0)	78 (72.2)	42 (45.7)	< 0.001
No	80 (40.0)	30 (27.8)	50 (55.4)	
Mean age at sexual debut (10–18)[c]	13.5 ± 2.15	13.0 ± 2.19	14.5 ± 1.70	0.001
Number of sexual partners[c]				
1	37 (87.8)	19 (27.1)	18 (64.3)	< 0.001
>1	61 (62.2)	51 (72.9)	10 (35.7)	
Condom use last sex[c]				
Yes	64 (57.7)	41 (53.3)	23 (67.7)	0.157
No	47 (42.3)	36 (46.8)	11 (32.4)	
Sexually risky[d]				
Yes	88 (47.8)	70 (66.7)	18 (22.8)	< 0.001
No	96 (52.2)	35 (33.3)	61 (77.2)	
Structural social support				
Total	3.44 ± 0.49	3.56 ± 0.48	3.29 ± 0.45	< 0.001
Special person	3.73 ± 0.67	3.89 ± 0.61	3.54 ± 0.69	< 0.001
Family	3.79 ± 0.66	3.89 ± 0.64	3.67 ± 0.67	0.023

Carver et al.

Page 13

Characteristic	Total (N = 200)[a]	Male (N = 108)	Female (N = 92)	p[b]
Friends	3.18 ± 0.75	3.22 ± 0.76	3.13 ± 0.74	0.442
School	3.04 ± 0.87	3.25 ± 0.84	2.79 ± 0.84	< 0.001
Functional social support				
Total	3.40 ± 0.62	3.46 ± 0.57	3.32 ± 0.67	0.106
Emotional	3.26 ± 0.69	3.24 ± 0.98	3.30 ± 0.76	0.572
Tangible	3.96 ± 0.80	3.99 ± 0.81	3.93 ± 0.80	0.603
Affectionate	3.40 ± 1.05	3.50 ± 0.94	3.27 ± 1.15	0.124
Positive social interaction	3.12 ± 1.12	3.29 ± 0.98	2.82 ± 1.21	< 0.001
Mean self-efficacy (1–4), SD	2.45 ± 0.30	2.50 ± 0.34	2.40 ± 0.25	0.033
Mean HIV knowledge (0–11), SD	5.98 ± 2.39	6.49 ± 2.20	5.38 ± 2.48	0.001
Mean perceived susceptibility (1–4), SD	2.28 ± 0.55	2.26 ± 0.59	2.30 ± 0.49	0.566
Mean social desirability (0–10), SD	5.87 ± 1.94	5.78 ± 1.85	5.97 ± 2.05	0.493

[a]Table values are mean ± SD for continuous variables and n (column %) for categorical variables. Values may not sum to n due to missing data

[b]p value is for t test (continuous variables) or for χ^2 test (categorical variables)

[c]Only includes sexually active participants who reported first sexual intercourse from ages 10 to 18

[d]Sexually risky indicates having had sex and at least one of the following: sexual debut between 10 and 13 years of age, more than one sexual partner, no condom last sex

Table 2

Adjusted logistic regression models with each of the five sexual risk outcomes

	Sexual risk outcome																			
	Outcome 1				Outcome 2				Outcome 3				Outcome 4				Outcome 5			
	Have had sex (N = 200)				Early sexual debut (N =172)[a]				More than one partner (N = 178)				No condom last sex (N =191)				Sexual risk composite (N = 184)[b]			
	AIC	271.2			AIC	169.3			AIC	167.9			AIC	215.2			AIC	193.4		
	AOR[c]	95 % CI[d]		p	AOR	95 % CI		p	AOR	95 % CI		p	AOR	95 % CI		p	AOR	95 % CI		p
Age[e]	1.56	(1.19, 2.04)		0.001					1.93	(1.44, 2.57)		< 0.001					1.78	(1.37, 2.30)		< 0.001
Sex (Male)	3.52	(1.68, 7.37)		0.001	5.42	(2.26, 13.00)		< 0.001	9.75	(3.87, 24.60)		< 0.001	3.33	(1.55, 7.19)		0.002	7.00	(3.19, 15.33)		< 0.001
Education[f]	1.94	(1.15, 3.26)		0.012																
Religion (Catholic vs. Christian)									3.03	(1.30, 7.06)		0.010								
Family structure[g]																				
No parent or grandparent, aunt/uncle													1.00							
Mother and father													0.51	(0.18, 1.41)		0.192				
Mother without father													0.26	(0.09, 0.78)		0.016				
Father without mother													0.36	(0.06, 2.23)		0.273				
Grandparent, aunt or uncle only													0.47	(0.13, 1.70)		0.249				
Sibling																	3.31	(1.33, 8.25)		0.012
Structural social support																				
Family									1.93	(1.03, 3.63)		0.040					2.03	(1.09, 3.76)		0.025
Functional social support																				
Emotional									0.50	(0.27, 0.92)		0.026					0.43	(0.23, 0.80)		0.008
Positive social interaction	1.72	(1.23, 2.41)		0.002													1.47	(1.01, 2.14)		0.043
Other measures																				
Self-efficacy (1–4)					0.20	(0.06, 0.74)		0.016												

SD standard deviation; *AIC* Akaike information criterion; *CI* confidence interval

[a]Participants who reported a sexual debut at or before age 13 were considered to have had early sexual debut. Seventeen participants were excluded because age of debut was <10 years old

[b]
The sexual risk composite variable indicates participants who reported engagement in sexual intercourse and one or more of the following: sexual debut at or before 13 years old, multiple sexual partners, and not having used a condom at last sexual intercourse

[c]
All explanatory variables that correlated with the dependent variable with a $p < 0.20$ were included in the full model. A backwards elimination strategy was used to generate the adjusted model. All explanatory variables in the adjusted model associated with the dependent variable with $p < 0.05$

[d]
95 % confidence intervals

[e]
Age was treated as a continuous variable. OR represents the increase in odds with each year of age

[f]
Education was treated as an ordinal variable. OR represents increase in odds with each of five categories (1st grade or less, 1st–6th, 7th–9th, 3rd–4th secondary school and graduated)

[g]
Family structure indicates with whom participants lived