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Sexual Risk Behaviors Among Adolescents In Port-Au-Prince, Haiti

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Abstract

Introduction: In the past decade, young people in Haiti have been engaging in riskier sexual behavior. The present study investigates correlates of sexual risk behaviors among adolescents in Port-au-Prince, Haiti.

Methods: The cross-sectional study included anonymous face-to-face interviews with 200 (108 male and 92 female) 13 to 18 year old participants. Data were collected on demographic, family and psychosocial characteristics and four sexual risk outcomes: having a history of sexual intercourse, early sexual debut, multiple sexual partners and condom use at last sexual intercourse. Unadjusted and adjusted logistic regression models were generated for each outcome and a composite sexual risk outcome.

Results: The majority of the sample (60.0%) had engaged in sexual intercourse. While controlling for potentially confounding variables, males were 3.52 times as likely to have had sexual intercourse (CI 1.68, 7.37), 5.42 times as likely to report sexual debut before 14 years of age (CI 2.26, 13.00), 9.75 times as likely to have more than one partner (CI 3.87, 24.60), and 3.37 times as likely to not have used a condom at last sex than females (1.56, 7.31). Additionally, adolescents who lived with only their mother were more likely to have used a condom at last sexual intercourse (OR for not using a condom=0.26, CI 0.09, 0.78).

Discussion: The present research reveals that adolescents in Port-au-Prince, Haiti are engaging in sexually risky behaviors. These findings emphasize a need for further research attention to the vulnerable demographic. Effective risk reduction interventions may be directed toward certain groups such as younger males and children not living with mothers or other adult relatives.

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Introduction

Haiti has the lowest Human Development Index score in the Western Hemisphere, and ranks 161st out of 187 nations.[1] The low HDI, a measure of welfare, education and standard of living, is reflected in relatively poor health outcomes. The 7.0M_w earthquake of 2010 exacerbated the many challenges faced by Haiti's population. The natural disaster shook the nation to a state of destitution, taking the lives of 220,000 people, injuring 300,000 and leaving 1.5 million homeless.[2] Millions in Haiti have been affected by the loss of family members, forced relocation and the vast physical and economic ruin.[2]

Outside of Africa, the Caribbean is one of the most HIV/AIDS affected regions of the world. Haiti is home to over half of those living with the disease in the region.[3] As of 2011, an estimated 1.8% of adults 15 to 49 years old are living with HIV/AIDS.[3] Certain populations have higher prevalence, including adolescents and young adults in a voluntary counseling and testing center in Port-au-Prince, of whom 6.3% of females and 5.5% of males were diagnosed with HIV.[4] Of the sample, 3.4% of 13 to 15 year olds and 4.7% of 15 to 19 year olds tested HIV positive.[4] 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.[3]

In the past two decades, Haiti has experienced a decline in HIV incidence and HIV/AIDS prevalence.[5] Mathematic modeling supported that the decline could only be due to reductions in sexually risky behavior.[6] A review exploring HIV/AIDS trends in Haiti revealed that increased HIV knowledge, condom use, and fidelity have explained

the decline.[5] However, in the time period, younger demographics have engaged in riskier sexual behavior.[7] Average sexual debut became younger and the proportion of adolescents who were sexually active increased.[5] Moreover, 2010 reports indicate that condom usage in 15 to 24 year olds remains low (32% in females and 33% in males).[3] A school-based study reported 27% of Haitian adolescents using a condom at last sexual intercourse and among the sexually active, 40% having had more than two sexual partners.[8]

Several correlates with 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 condition can influence sexual risk.[9, 10, 11] Youth can be particularly vulnerable to acquiring STIs due to heightened sexual curiosity.[12] One study examining individual psychosocial predictors of risky behavior in young people found impulsive propensity to associate with sexual risk behavior.[13] In a study among Haitian adolescents outside of Port-au-Prince, lower condom use associated with lower self-efficacy to communicate about HIV/AIDS and perceived barriers to condom use.[8]

Demographic factors such as male gender, lower education and other low socio-economic status indicators have been associated with riskier sexual behavior.[14] Family structure characteristics including absence of parents, single parent households and being married have also predicted sexual risk.[4, 14] No findings have been published regarding the correlates of risky sexual behavior among Haitian youth after the earthquake of January 12, 2010. The conditions of family structure and social support could have changed following the earthquake. Furthermore, the importance of the

factors to health attitudes and behaviors of adolescents could be different since the catastrophe.

The present research examines the importance of demographic, family structure, and psychosocial factors in predicting STI/HIV sexual risk behaviors among Haitian adolescents 13 to 18 years old. To quantify sexual risk behaviors, the study measured history of sexual intercourse, age of sexual debut, number of sexual partners and condom use at last intercourse. The results of this study could assist the development of successful STI/HIV prevention interventions by identifying high-risk groups and targeting factors associated with risky sexual behaviors. This research aims to draw attention to the vulnerable demographic and improve their sexual health outcomes by informing evidence-based interventions.

Methods

Study Design

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

Participant Selection

Eligible participants were between 13 and 18 years old and residents of Port-au-

Prince. Multiple methods were used for participant recruitment. Three recruiters who worked for GHESKIO's youth program offered participation to adolescents involved in the program and others from neighborhoods near the research center. Experienced interviewers who were further trained for the questionnaire also contributed to enrollment by finding 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 several neighborhoods of western Port-au-Prince. All interested adolescents were given a brief description of the nature of the interview. Interviewers obtained verbal assent before proceeding with the interview.

Data Collection

For each participant, data were collected during face-to-face interviews in Haitian Creole by trained Creole-speaking interviewers. A majority (96.0%) of interviews were done with same sex interviewers. 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 professionals. The instrument was pilot tested with 16 participants to identify confusing or misleading questions and issues related to cultural sensitivity. Only minor modifications were made.

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 forty minutes and

never exceeded one hour. Participants received compensation for travel, a phone card, and refreshments valued at approximately U.S. $5.00. Yale University and GHESKIO institutional review boards granted approval for the study and waived the need for parental and written adolescent consent.

Instrument

Sexual Behaviors

The four main outcomes included sexual behaviors related to sexual initiation, age of sexual debut, lifetime number of sexual partners and condom use at last intercourse using questions that had been previously validated among Haitian adolescents.[15, 8] A dichotomous variable indicated whether the participant had a history of sexual intercourse.[15] Adolescents who reported not having had sex were not asked further sexual behavior questions. Sexually active participants were asked their age at sexual debut. They were also asked their number of lifetime sexual partners and those who were unsure were asked to provide an estimate.[8] A question asking whether the participant or their partner used a condom at last sexual intercourse requested a yes/no binary response.[8]

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 spends 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, and grandparents, aunts and/or uncles.

Perceived Social Support (PSS) Assessment

The study included two social support scales. The Multi-dimensional Scale of Perceived Social Support measured structural domains of social support including special person, family and friends and has been validated for adolescents.[18, 19, 20] The Medical Outcome Study (MOS) Social Support Survey assessed functional measures of social support.[21] The MOS survey includes 18 items each with a Likert 5 item 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-item Likert scale to reduce the complexity for the youth.[22]

HIV Knowledge, Perceived Susceptibility, and Self-Efficacy

Knowledge of HIV infectivity was measured with the HIV Knowledge scale including 11 true/false items.[16] 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).[17] 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.[23] The scale was developed to identify participants who choose answers that create a positive or socially acceptable impression to detect and address the potential for reporting bias. In this study, a shortened form of the scale was used.[24, 25, 26] The psychometric properties of the shortened instrument have been established.[26] The version consists of 10 items eliciting a yes/no dichotomous response. Participants were given total scores out of 10 possible points.

Data Analysis

The sample was described with means, standard deviations and confidence intervals stratified by sex. The five sexual behavior outcomes included ever had sex, age at sexual debut 13 years of age or younger, more than one sex partner, did not use a condom at last sex, and a composite sexual risk variable. The composite sexual risk outcome was a binary variable indicating participants who had had sex and one or more of the other risk variables. Unadjusted and adjusted logistic regression analyses were conducted to identify associations between potential correlates and sexual risk behaviors. Participants who had reported not having had sex were included in the analyses as not having the sexual risk outcome.

Potential correlates included age, gender, family structure, social support, HIV knowledge, perceived HIV susceptibility, self-efficacy and social desirability. All variables that were associated with the outcome with a p-value less than or equal to 0.20 were included in each full model. Using a backward elimination strategy, reduced

models were generated that included only covariates with a 0.05 level of significance or less. For the composite outcome, effect modification between associated independent variables and both age and gender were assessed with interaction terms. All data were analyzed using SAS 9.3 software.

Results

Sample Description

Demographic data and other descriptive characteristics of the study sample are presented in Table 1. Participants were 200 adolescents (108 male and 92 female) (Mean age = 15.78, SD = 1.62). Approximately two-thirds (63.5%) of the sample 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). Thirty-eight percent 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 works (85.3%).

Males reported significantly greater overall structural social support using the MDSPSS (males 3.44 (0.49), females 3.29 (0.45), $p < 0.001$) and for the special person and school subscales (Table 1). There was no overall difference in functional social support by gender. However, males reported significantly higher positive social interaction (males 3.29 (0.98), females 2.82 (1.21), $p < 0.001$).

Male participants had greater HIV Knowledge scores than female participants (males 6.49 (2.20), females 5.38 (2.48), p = 0.001). Males also reported higher self-efficacy for practicing safer sex than females (males 2.50 (0.34) and females 2.40 (0.25), p = 0.033). There was no significant difference between genders related to perceived susceptibility to HIV or social desirability (p > 0.05).

Sexual Behavior

One hundred twenty participants (60.0%) had ever had sexual intercourse with significant differences by gender: 72.2% of males and 45.7% of females had engaged in sexual intercourse (Table 1). Seventeen participants (16 male and one female) who reported sexual debut younger than 10 years of age were not included in the analysis because of concerns about the validity of the report and/or the nature of the sexual debut such as coercion or abuse. Among those not excluded, the mean age of first intercourse was 13.0 (SD = 2.2) for males and 14.5 (SD = 1.7) for females (p=0.001, Table 1).

Among sexually active participants, the number of sexual partners reported ranged from one to 25 and 62.2% of sexually active adolescents reported having had more than one partner (Table 1). This outcome differed significantly by gender. A majority of sexually active males (72.9%) and a minority of sexually active females (35.7%) reported having had more than one partner (p < 0.001). Fifty-eight percent of sexually active subjects reported using a condom at last sexual intercourse (53.3% male, 67.7% female, p > 0.05, Table 1).

The composite sexual risk outcome excluded participants with one or more missing sexual risk outcome unless they reported risky behavior for at least one of the other outcomes. Out of the 184 with valid responses for this measure, 47.8% (n=88) were classified as risky. Male participants were more likely than female participants to have the sexually risky composite outcome (male 66.7%, female 22.8%, $p < 0.001$).

Correlates of Sexual Behavior

Gender predicted all of the sexual risk outcomes in the reduced models. While controlling for other associated variables, males were more likely to have had sex (OR=3.52, $p < 0.001$), sexual debut between 10 and 13 (OR=5.99, $p <0.001$), more than one sexual partner (OR=9.75, $p<0.001$) and not used a condom at last sex (OR=3.37, $p = 0.003$). Using the composite sexually risky indicator, males were 7.00 times as likely to be considered sexually risky as females ($p < 0.001$). Age, as a continuous variable, also significantly correlated positively with having had sex (OR=1.56, $p= 0.001$), having had more than one partner (OR=1.93, $p < 0.001$) and the composite risk variable (OR=1.78, $p < 0.001$). However, there was no association between age and early sexual debut or condom use at last sexual intercourse (Table 2).

Several family structure variables showed associations with sexual risk. In the unadjusted model, having reported more than one sexual partner associated with the absence of parents and guardians. In comparison to not living with a parent, grandparents, aunts or uncles, participants living with both parents (OR=0.35, $p=0.036$), those living with their mother and not their father (OR=0.33, $p=0.032$), and those living with grandparents aunts or uncles (OR=0.14, $p=0.005$) were less likely to have had

more than one sexual partner (Table 2). While adjusting for gender, participants who lived with a mother and no father were more likely to have used a condom at last sex than those who did not live with parents or grandparents, aunts or uncles (for not using a condom OR=0.26, p=0.016). Having at least one sibling in the home consistently was associated with higher risk and remained in the reduced model for the composite variable (OR= 3.31, p= 0.012).

Of the perceived social support domains, social support from family and positive social interaction both positively correlated with the risky composite outcome (family OR=2.03, p=0.025 and positive social interaction OR=1.47, p=0.043) while emotional social support was associated with lower likelihood of risky sex (OR=0.43, p=0.008). These findings were consistent with the direction of association with the individual sexual risk outcomes (Table 2).

HIV Knowledge scores were positively associated with several of the sexual risk outcomes including the composite outcome (OR=1.19, p=0.009) but did not significantly associate 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 (OR=0.20, p=0.016). Neither perceived susceptibility to HIV infection nor social desirability significantly associated with any of the sexual risk outcomes.

Interactions with Age and Gender

There were no interactions between any of the correlates with age and gender at the 0.05 level of confidence for the composite outcome. Figure 1 shows the relationship between age and gender. The proportion of female participants with the composite

sexual risk outcome was much lower overall than the proportion of male participants (male 66.7%, female 22.8%, $p<0.001$). Within each gender group, there were much greater proportions of older adolescents (16-18) with the composite sexual risky outcome than younger (13-15) adolescents (male $p=0.017$, female $p=0.001$, Figure 1). The main effects of greater risk among males and older adolescents held across levels of the other variable. The cross-product variables revealed no evidence of interaction of independently correlating variables with gender or age in the association with the composite sexual risk variable ($p>0.05$).

Discussion

This study examined correlates of sexual risk behavior among a sample of 13 to 18 year old adolescents in Port-au-Prince, Haiti. Sixty percent of the participants had engaged in sexual intercourse compared with 47.4% of U.S. high school students.[27] Furthermore, 42.3% of those among the sexually active adolescents reported not using a condom at last sexual encounter. The high prevalence of sexual activity and low condom use rates calls for determined STI prevention interventions among young adolescents in the urban center. Approaches may include improving education about protective sexual behavior, expanding access to condoms and increasing STI testing among the population.

The finding that male gender associated with increased sexual risk was consistent with other studies among Caribbean youth.[14] However, these data contrast with a previous study conducted among young adults in Port-au-Prince. The results showed more females than males reported not having used a condom.[4] The

inconsistency may be attributed to the difference in sample recruitment and eligibility because the previous investigation included older participants who voluntarily visited an STI clinic. The greater overall sexual risk among young males revealed in this study could be informative in the development of targeted interventions because it may be more important to involve male youth earlier than female youth.

Participants with a mother in the home with no father and those with no parents but at least one grandparent, aunt or uncle generally reported less risky sexual behavior compared with participants not living with a parent, grandparent, aunt or uncle. These findings signal a need for attention toward the sexual health of youth who live with a father only and those with no parent or guardian in the home. A demographic health survey in 2005 and 2006 found that children in 32.5% of households were considered orphaned or vulnerable according to UNICEF's standards.[28] Many young people in Haiti were recently orphaned from the vast mortality caused by the 2010 earthquake. Although these data did not include reasons for not living with parents or guardians, there may be psychosocial factors moderating the association between family structure and sexual behavior. The results demand further focus on youth not living with mothers or grandparents, aunts or uncles.

Emotional social support was consistently negatively correlated with risky sexual behavior. The construct indicates that 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 include support groups and family-based therapy. Positive social interaction, defined as having someone with whom to relax and have fun, was positively correlated with sexual risk behavior. This

unexpected association may be because the adolescents at greater risk have fun and relax with their sexual partner.

The limitations of this investigation result from its cross-sectional design and relatively small sample size. Associations between the independent variables and the sexual risk outcomes should be interpreted as correlations rather than causal relationships. Our sample size precluded a more in-depth exploration of possible interactions. 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 could examine the circumstances under which adolescents are having sexual intercourse and their reasons for engaging in sexual risk behavior. For example, the reports of sexual debut before ten years of age may represent actual voluntary sexual engagement, sexual abuse, or a misunderstanding of the question. Likewise, participants who reported not having used a condom at last sexual intercourse could 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 poverty making the development of effective interventions especially challenging. This study demonstrates the substantive STI/HIV risk and the clear need for public health action to reduce transmission among Haitian youth.

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Table 1 Description of the sample, total and by gender

Characteristic	Total = 200[a]	Sex		p[b]
		Male (N = 108)	Female (N = 92)	
Age (years)	15.78 ± 1.62	15.79 ± 1.64	15.77 ± 1.61	0.947
Education Level				0.676
≤ 9 years	127 (63.5)	70 (64.8)	57 (62.0)	
>10 years	73 (36.5)	38 (35.2)	35 (38.0)	
Religion				0.332
Catholic	66 (33.8)	32 (30.8)	34 (37.4)	
Other Christian	129 (66.2)	72 (69.2)	57 (62.6)	
Number in the Home	6.20±2.60	6.38±2.64	5.99±2.54	0.294
Family Structure in the Home				0.215
Mother and father	76 (38.0)	40 (37.0)	36 (39.1)	
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				0.098
Yes	162 (85.3)	91 (89.2)	71 (80.7)	
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)	
Age at Sexual Debut (10-18)[c]	13.47 ± 2.15	12.98 ± 2.19	14.47 ± 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				
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
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
Self-Efficacy (1-4)	2.45 ± 0.30	2.50 ± 0.34	2.40 ± 0.25	0.033
HIV Knowledge (0-11)	5.98 ± 2.39	6.49 ± 2.20	5.38 ± 2.48	0.001
Perceived Susceptibility (1-4)	2.28 ± 0.55	2.26 ± 0.59	2.30 ± 0.49	0.566
Social Desirability (0-10)	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 Unadjusted and adjusted logistic regression models with each of the five sexual risk outcomes

	Model 1 Have Had Sex (N=200)				**Model 2 Early Sexual Debut (N=172)**[a]				**Model 3 More Than One Partner (N=178)**			
	Unadjusted		Adjusted[c]		Unadjusted		Adjusted		Unadjusted		Adjusted	
	OR	CI[d]	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI
Age[e]	1.82	(1.48, 2.25)	1.56	(1.19, 2.04)	1.09	(0.87, 1.36)			1.63	(1.30, 2.05)	1.93	(1.44, 2.57)
Gender (Male)	3.10	(1.72, 5.57)	3.52	(1.68, 7.37)	4.57	(1.96, 10.69)	5.42	(2.26, 13.00)	7.08	(3.27, 15.30)	9.75	(3.87, 24.60)
Education[f]	2.49	(1.69, 3.67)	1.94	(1.15, 3.26)	1.12	(0.74, 1.69)			1.72	(1.19, 2.50)		
Parent/Guardian Works	1.61	(0.72, 3.61)			0.85	(0.31, 2.33)			1.07	(0.43, 2.68)		
Amount Spent at Market[g]	0.77	(0.47, 1.25)			1.00	(0.57, 1.77)			0.81	(0.50, 1.32)		
Religion (Catholic vs. Christian)	1.34	(0.73, 2.47)			0.59	(0.26, 1.32)			1.90	(0.99, 3.65)	3.03	(1.30, 7.06)
Number in Home	0.93	(0.84, 1.04)			1.04	(0.91, 1.19)			0.97	(0.85, 1.10)		
Family Structure[h]												
No parent or grandparent, aunt/uncle	1.00				1.00				1.00			
Mother and father	0.64	(0.23, 1.73)			0.45	(0.15, 1.36)			0.35	(0.13, 0.93)		
Mother without father	0.74	(0.27, 2.07)			0.48	(0.15, 1.48)			0.33	(0.12, 0.91)		
Father without mother	1.02	(0.20, 5.15)			2.32	(0.47, 11.54)			0.46	(0.10, 2.12)		
Grandparent, aunt or uncle only	0.36	(0.11, 1.12)			0.32	(0.08, 1.32)			0.14	(0.04, 0.54)		
Sibling	1.19	(0.63, 2.27)			1.76	(0.72, 4.34)			1.60	(0.76, 3.39)		
Structural Social Support												
Special Person	1.36	(0.89, 2.08)			1.32	(0.74, 2.35)			1.24	(0.77, 1.99)		
Family	1.09	(0.71, 1.68)			1.69	(0.90, 3.17)			1.26	(0.78, 2.05)	1.93	(1.03, 3.63)
Friends	1.13	(0.77, 1.65)			1.08	(0.66, 1.75)			0.71	(0.47, 1.08)		
Functional Social Support												
Emotional	0.91	(0.60, 1.37)			0.84	(0.51, 1.40)			0.62	(0.39, 0.98)	0.50	(0.27, 0.92)
Tangible	1.12	(0.79, 1.59)			0.86	(0.55, 1.33)			1.05	(0.71, 1.55)		
Affectionate	1.43	(1.08, 1.89)			1.03	(0.73, 1.45)			1.15	(0.85, 1.55)		
Positive Social Interaction	1.97	(1.48, 2.63)	1.72	(1.23, 2.41)	1.32	(0.96, 1.83)			1.60	(1.19, 2.15)		
Other Measures												
HIV Knowledge (0-11)	1.12	(1.00, 1.27)			1.05	(0.90, 1.22)			1.23	(1.07, 2.42)		
Perceived Susceptibility (1-4)	0.95	(0.57, 1.58)			1.21	(0.63, 2.34)			1.03	(0.60, 1.78)		
Self-Efficacy (1-4)	0.63	(0.25, 1.60)			0.30	(0.09, 1.05)	0.20	(0.06, 0.74)	0.84	(0.30, 2.34)		
Social Desirability (0-10)	0.94	(0.82, 1.09)			1.19	(0.98, 1.45)			1.00	(0.85, 1.17)		

	Model 4 No Condom Last Sex (N=191)				Model 5 Sexual Risk Composite (N=184)[b]			
	Unadjusted		Adjusted		Unadjusted		Adjusted	
	OR	CI	OR	CI	OR	CI	OR	CI
Age	0.98	(0.80, 1.20)			1.50	(1.23, 1.83)	1.78	(1.37, 2.30)
Gender (Male)	3.37	(1.59, 7.12)	3.37	(1.56, 7.31)	6.78	(3.49, 13.17)	7.00	(3.19, 15.33)
Education	0.92	(0.63, 1.35)			1.48	(1.05, 2.10)		
Parent/Guardian Works (N=190)	0.90	(0.35, 2.29)			1.09	(0.47, 2.51)		
Amount Spent at Market (N=95)	0.74	(0.44, 1.26)			0.67	(0.24, 1.89)		
Religion (Catholic vs. Christian) (N=195)	1.12	(0.56, 2.25)			1.11	(0.60, 2.06)		
Family Structure								
Number in Home (N=195)	1.09	(0.97, 1.23)			0.98	(0.88, 1.10)		
Family Structure								
No parent or grandparent, aunt/uncle	1.00		1.00		1.00			
Mother and father	0.43	(0.16, 1.16)	0.51	(0.18, 1.41)	0.43	(0.16, 1.18)		
Mother without father	0.24	(0.08, 0.71)	0.26	(0.09, 0.78)	0.45	(0.16, 1.27)		
Father without mother	0.30	(0.05, 1.75)	0.36	(0.06, 2.23)	0.58	(0.12, 2.87)		
Grandparent, aunt or uncle only	0.34	(0.10, 1.18)	0.47	(0.13, 1.70)	0.16	(0.05, 0.57)		
Sibling	1.37	(0.62, 3.03)			2.05	(1.02, 4.09)	3.31	(1.33, 8.25)
Structural Social Support								
Special Person	1.51	(0.90, 2.55)			1.38	(0.87, 2.17)		
Family	1.10	(0.66, 1.83)			1.52	(0.95, 2.43)	2.03	(1.09, 3.76)
Friends	0.82	(0.53, 1.28)			0.95	(0.64, 1.40)		
Functional Social Support								
Emotional	0.85	(0.53, 1.35)			0.72	(0.72, 1.11)	0.43	(0.23, 0.80)
Tangible	1.00	(0.67, 1.50)			1.04	(0.72, 1.51)		
Affectionate	1.00	(0.73, 1.37)			1.18	(0.89, 1.56)		
Positive Social Interaction	1.23	(0.91, 1.67)			1.65	(1.25, 2.18)	1.47	(1.01, 2.14)
Other Measures								
HIV Knowledge (correct out of 12)	1.11	(0.96, 1.28)			1.19	(1.04, 1.35)		
Perceived Susceptibility	0.75	(0.42, 1.35)			1.05	(0.63, 1.75)		
Self-Efficacy	0.65	(0.22, 1.91)			0.76	(0.29, 1.95)		
Social Desirability	0.92	(0.78, 1.09)			0.98	(0.84, 1.14)		

[a] Particpants who reported a sexual debut at or before age 13 were considered to have had early sexual debut

[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 5 categories (1st grade or less, 1st- 6th, 7th – 9th, 3rd -4th secondary school and graduated).

[g] Many participants did not report amount spent at market (n = 95)

[h] Family structure indicates with whom participants lived

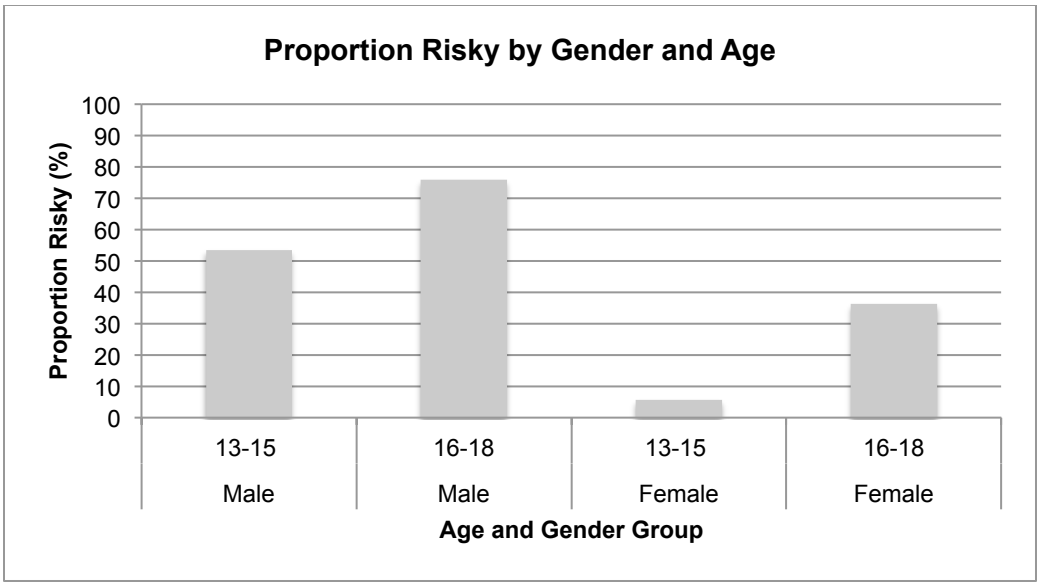

Figure 1 Interaction between gender and age groups (13-15 and 16-18) in predicting sexual risk. P-value = 0.168 for interaction between age and gender on likelihood of composite sexual risk outcome. Composite sexual risk outcome was defined as having had sex and one or more of the following: sexual initiation between 10 and 13, more than one partner, and not having used a condom at last sex.