



## Factors associated with sexual activity among high-school students in Nairobi, Kenya

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### Abstract

The high level of HIV infection in sub-Saharan Africa has led to an increased interest in understanding the determinants of sexual activity among young people, who are at high risk of sexually transmitted infections. The present study examined sociodemographic, behavioral, and psychosocial factors associated with heterosexual activity among a sample of 3556 male and female high-school students in Nairobi, Kenya. Approximately 50% of the males and 11% of females reported having had sexual intercourse at least once in their lifetime with a significant proportion reporting multiple sexual partnerships. Sexual activity was associated with various factors including religiosity, perceived parental attitudes towards sex, living arrangements, and school characteristics. However, the pattern of association differed for males and females. Results suggest that adolescents may benefit from sex education programs addressing multiple factors that may predispose adolescents to sexual activity, and that take into account gender differences.

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## Introduction

Adolescence is a transitional period of physical, emotional, and social maturation that culminates in increased independence, autonomy, and a greater sense of one's personal identity (Kaaya et al., 2002; Kelly, 2001; Lema, 1990). Key developmental processes during adolescence include sexual maturation and definition of sexual self-concept (Haffner, 1998). As young people clarify their sexual values, it is common for them to experiment with sexual behaviors (Kelly, 2001) that may increase the risk of sexually transmitted infections (STIs) and poor reproductive health outcomes. The macro-context may play a critical role in the evolution of sexual self-concept by imposing culturally defined gender roles. For example, there is evidence that young people's sexual encounters in parts of Africa are negotiated in an environment where males are expected to exert control over sexuality and reproduction, while females are expected to play a more subservient role (Campbell & MacPhail, 2002; Varga, 2003). In addition, many African societies place a high value on virginity at marriage, especially for females. However, with increasing globalization, urbanization, and other social changes, there are distinct changes in the sexual values of young people (Gage & Meekers, 1993), with a general trend towards initiating sexual activity earlier in adolescence and increasing value placed on sexual gratification rather than safer sex (Kelly, 2001) or conformity to traditionally sanctioned codes of sexual conduct.

In spite of cultural norms disapproving of premarital sexual intercourse (Gage & Meekers, 1993; Worthman & Whiting, 1987), the prevalence of sexual activity among unmarried youth in Kenya is high. In the most recent Kenyan Demographic and Health Survey (KDHS), 41% and 21% of never-married males and females aged 15–24 years reported sexual activity in the 12 months preceding the survey (Central Bureau of Statistics (CBS) [Kenya], Ministry of Health (MOH) [Kenya], & ORC Marco, 2004). Condom use within the same age group is low, with less than 50% reporting condom use at last intercourse. Further, a significant proportion (2% of females and 11% of males) reports multiple sexual partnerships (CBS, MOH, & ORC Macro, 2004). Thus, sexual activity during adolescence may heighten the risk of acquiring STIs, including HIV. Indeed, in Kenya, 5.2% of women aged 15–24 years are living with HIV/AIDS, as are 1.0% of their male counterparts (UNAIDS/WHO, 2005).

Studies from several African countries have shown that school-going or educated youth, particularly females, may be less likely to engage in risky behavior and, therefore, less vulnerable to HIV infection than out-of-school youth (Agha, Hutchinson, & Kusanthan, 2006; Babalola, Tambashe, & Vondrasek, 2005; Flisher & Chalton, 1995; Hargreaves et al., 2008; Mathews et al., 2008; Pettifor et al., 2008). For example, among females surveyed in the 2003 KDHS, level of education was strongly related to age at first sex with about 25% of women 15–24 years with no education reporting sexual activity by age 15 compared to only 4% among those with at least some secondary education (CBS, MOH, & ORC Macro, 2004). Hargreaves et al. (2008) present more recent evidence of the protective nature of school attendance and observe that school attendance is associated with a lower likelihood of reporting multiple partnerships, unprotected sexual intercourse, or, among females, sexual intercourse with a male partner more than 3 years older.

Although existing evidence demonstrates that in-school adolescents engage in less risky sexual behavior than their out-of-school counterparts, studies conducted within school settings demonstrate that in-school youth are also at risk for negative sexual and reproductive health outcomes stemming from risky sexual behavior, such as multiple sexual partnerships and

unprotected sexual intercourse. In their examination of premarital sexual activity among in-school adolescents in Kenya, Kiragu and Zabin (1993) reported that 69% of male and 27% of female secondary school students were sexually experienced and of these, 53% of males and 5% of females reported at least four sexual partners in their lifetime. In this study, other correlates of sexual experience included increasing age, low religiosity, having sexually active peers, substance use, and liberal attitudes towards premarital sex. Male gender (Hartell, 2005; Kaaya et al., 2002; Maswanya et al., 1999; Mathews et al., 2008; Siziya, Muula, Kazembe, & Rudatsikira, 2008), low parental supervision (Kiragu & Zabin, 1993; Siziya et al., 2008), and low socio-economic status, especially among females (Brook, Morojele, Zhang, & Brook, 2006; Mathews et al., 2008) have also been associated with increased likelihood of sexual activity and risky sexual behavior (e.g. lack of condom use).

In the absence of curative treatments for HIV/AIDS, prevention remains the most effective weapon against the HIV/AIDS pandemic. Actions recommended for prevention include abstinence, long-term monogamy with an uninfected partner, having fewer sexual partners, as well as correct and consistent condom use (Davis & Weller, 1999). To design effective prevention interventions, it is important to understand the dynamics and determinants of people's sexual behavior within the social contexts where these sexual encounters occur. For example, socio-cultural norms regarding sexuality play an important role in controlling sexual behavior (Airhihenbuwa, 1995; Eaton, Flisher, & Aaro, 2003). Likewise, schools represent the most important socialization setting outside of the family for many young people (Mensch et al., 2001) and could influence sexual behavior, as well as present a pool of potential sexual partners.

Guided by a conceptual framework used by Akwara, Madise, and Hinde (2003) to examine perceived risk and sexual activity among Kenyan men and women interviewed in the 1998 KDHS, the purpose of the present study is to examine sociodemographic characteristics, socio-cultural factors, cognitive variables, and related behaviors associated with heterosexual intercourse among a sample of high-school students in Nairobi, Kenya. There is an accumulation of evidence on sociodemographic, behavioral, and psychosocial correlates of sexual behavior among in-school youth (Kaaya et al., 2002; Kiragu & Zabin, 1993; Lema, 1990; Mathews et al., 2008; Siziya et al., 2008). However, while schools have been the setting for many studies on adolescent sexual behavior, few have examined the effects of school characteristics on sexual behavior. Nevertheless, examining factors associated with sexual activity among young people within a school-setting contributes to the body of knowledge that informs the development of effective school-based HIV prevention. Further, as formal education becomes more widespread (Blum, 2007), it becomes important to study how school and personal characteristics might affect students' sexual behavior.

## Methods

### *Data collection and management*

Field work was conducted during the third term of the Kenyan school calendar in September and October 2004 with the help of two trained research assistants. A random sample of 32 schools was selected from a sample frame comprising all (approximately 120) public schools in Nairobi stratified by type of school (co-educational or single-gender schools, and boarding or day

schools). Boarding schools are a common educational establishment in Kenya. Within each school, one class per grade level was selected to participate in the study. Data were collected using a 155-item, self-administered questionnaire constructed based on the conceptual framework. The questionnaire was administered in English, the official language of instruction in Kenyan schools. Students completed the questionnaire in approximately 1 h in a classroom-setting. Completed surveys were manually checked for errors prior to data entry. Approximately, 10% of questionnaires were double-entered. Less than 1% of the entries had mismatched data.

Research procedures were approved by the Institutional Review Board of the University of Georgia and clearance to conduct the study in Kenya granted by the Kenyan Ministry of Education, Science and Technology. Students were verbally briefed on their rights as participants in the study and did not provide signed consent as a guarantee of anonymity. Only students present at the time of data collection were included in the study.

### *Measures*

Selection of variables was guided by the conceptual model used by Akwara et al. (2003). Briefly, their conceptual model posits that perceived risk of HIV infection, sexual activity, and HIV preventive practices (e.g. HIV testing) are influenced indirectly by background variables at the national, community and individual levels, such as rural or urban residence and age, and directly or indirectly by intermediate sociodemographic and psychosocial factors, such as HIV/AIDS knowledge.

The questionnaire elicited responses on a wide range of variables including sociodemographic characteristics, socio-cultural factors (perceived adult gender role attitudes and parental attitudes towards sex and condom use), as well as behavioral and cognitive variables (risk behaviors, HIV/AIDS knowledge, perceived risk of STI infection, gender role attitudes, and religiosity). The questionnaire was evaluated by two reviewers with experience working with adolescent populations in Kenya.

### *Sociodemographic characteristics*

Sociodemographic characteristics assessed include age, rural or urban residence, type of school (co-educational or single-gender schools, and boarding or day schools), and socio-economic status. Socio-economic status was measured using an index based on reported household possession of eight durable assets and amenities (electricity, running water, flushing toilet, functioning radio, refrigerator, television set, video cassette deck, and a car). Principal components analysis (PCA) was used to generate standardized weight scores which were summed to produce index scores. The index scores were subsequently ranked to generate wealth quartiles.

### *Perceived adult gender role attitudes*

The respondents' perception of gender role attitudes held by adults in their community was assessed using a 15-item gender role attitudes scale adapted from Karim, Magnani, Morgan, and Bond (2003) (sample item – adults in my community believe it is okay for a boy to do household chores). Students rated each item using a 5-point scale ranging from *strongly agree* to *strongly disagree*. Students completed a similar scale, *gender role attitudes*, to report on their own attitudes. The 15 items of the adult scale were reworded to reflect personal attitudes towards gender roles. In

both scales, a high score on the scale indicates stronger support for distinct male and female roles. Cronbach's alpha for the scores of these scales was 0.78 for the perceived adult attitudes and 0.76 for the student attitudes.

#### *Parental/caregiver attitudes towards sex and condom use*

Indicators were derived from answers to a two-item scale adapted from Kiragu (1991). The two items were: 'suppose you were having sex and your parents (or the adults you live with) found out, they would be' and 'if your parents (or the adults you live with) found out that you carry condoms, they would be.' Possible responses were *very angry*, *somewhat angry*, and *probably not mind*. Higher scores indicate permissive attitudes. Cronbach's alpha of the scores was 0.63.

#### *Sexual practices and risk behaviors*

Sexual measures included age at first sexual intercourse, condom use at last intercourse, and the number of lifetime sexual partners. Respondents were also asked the frequency with which they engaged in seven risk behaviors considered to be an indication of risk taking behavior (Kiragu, 1991): going to a disco club, attending parties for youth, smoking cigarettes, drinking beer, drinking illicit brews, smoking marijuana, and using other recreational drugs. Possible responses were *never*, *rarely*, *sometimes*, and *often*. Cronbach's alpha of the scores of the risk behavior scale was 0.77. A composite measure of risk behavior was computed by weighting the scores for each item on the risk behavior index by factor loadings generated from PCA, and then adding the weighted scores across the seven items.

#### *HIV/AIDS knowledge*

The knowledge index adapted from Hou (2004) comprises 10 general questions about HIV/AIDS and 5 questions related to HIV testing (sample item – HIV/AIDS can be transmitted through mosquito bites). Possible responses are *true*, *false*, and *not sure*. Each correct response was scored as a 1, while incorrect or *not sure* responses were scored as 0. Item scores were then added across the 15 items resulting in total scores ranging from 0 to 15, with higher scores indicating higher knowledge of HIV/AIDS.

#### *Perceived risk of STI*

Perceived risk for HIV infection and other STIs was assessed using a four-item scale from Mahoney, Thombs, and Ford (1995). Students rated each item using a five-point scale ranging from *strongly agree* to *strongly disagree*. Scale scores ranged from 4 to 20, with higher scores indicating greater perceived risk of sexually transmitted infections. Cronbach's alpha of the scores of the perceived risk scale was 0.80.

#### *Religiosity*

Respondents indicated how frequently they attended religious services in the month prior to the survey and the importance of religion in their lives. Participants were grouped into one of three groups based on their responses to the aforementioned items: *low/medium low religiosity* (attended 0–2 services in prior month, some importance placed on religiosity OR no attendance and low importance placed on religiosity), *medium high religiosity* (attended 2–4 services in prior month,

some importance placed on religiosity OR high importance placed on religiosity but low attendance), and *high religiosity* (attended 4 or more services in prior month, high importance placed on religiosity).

### *Analyses*

To account for potential gender differences, separate analyses were conducted for males and females. To reduce the bias associated with listwise deletion (McDermeit, Funk, & Dennis, 2007), missing values of items within a scale were replaced with composite scores computed from the average of non-missing scale items as long as 65% of items in the scale had non-missing values. For religiosity, a nominal variable, missing values were imputed from the median score of those with non-missing responses. Basic univariate statistics (means, standard deviations, and frequency counts) were computed to describe the demographic characteristics as well as sexual and risk behaviors of respondents. Unadjusted odds ratios ( $OR_{unadj}$ ) were computed to examine differences in sexual experience by categorical variables. Cross tabulations and *t*-tests were used to compare frequencies and means of variables found to be significantly associated with sexual experience. Effect sizes for differences between sexually experienced and inexperienced respondents on continuous variables were computed using Cohen's *d* statistic. Cohen's *d* is an effect size measure computed by dividing the difference between two independent group means by the within-population standard deviation. This effect size measure gives an indication of the degree to which the null hypothesis (that there is no difference between the two means) is false; in other words, the effect size is an indicator of how meaningful is the difference between groups. According to Cohen's guidelines, Cohen's *d* values of 0.20, 0.50, and 0.80 reflect small, medium, and large effect sizes, respectively (Cohen, 1992).

Logistic regression analysis was used to examine factors that distinguished between sexually inexperienced (coded as 0) and experienced (coded as 1) respondents. Because individual students are nested in classrooms and schools, class and school were controlled for in the multivariate analyses. All analyses were conducted using SPSS software, Version 14.0 (SPSS Inc., 2005).

## **Results**

### *Participants*

Data were collected from 3612 respondents. Fifty-six students did not answer the question about whether they had ever had sexual intercourse. Thus, the final sample for this study is 3556 students. Forty-six percent of the respondents were female ( $n = 1657$ ). Over 60% of the students were boarders at school and the majority attended single-gender schools (82% of females and 72% of males). Participants ranged in age from 12 to 25 years, with a mean age of 16.6 years (standard deviation [SD] = 1.51). Over 80% of the respondents reported that they were Christians, with about 30% stating that they were Catholics. Nineteen percent of the respondents had lived in a rural area for the past five years, and just over 60% of the respondents noted living with both their parents during school vacations. Table 1 summarizes the demographic characteristics of the participants by gender.

Table 1  
School, family and religious characteristics of respondents by gender

Variable	Female ( <i>N</i> = 1657)	Male ( <i>N</i> = 1899)
Class level		
Form 1 (9th grade)	26.9%	26.8%
Form 2 (10th grade)	27.8%	28.6%
Form 3 (11th grade)	27.6%	23.6%
Form 4 (12th grade)	17.6%	21.0%
National or provincial school		
National	17.0%	28.6%
Provincial	83.0%	71.4%
Type of school		
Single gender – day school with/without boarding	32.7%	19.9%
Single gender – boarding school	49.7%	52.4%
Mixed – day school with/without single gender boarding	11.6%	18.5%
Mixed – day and boarding school	6.0%	9.2%
Day scholar or boarder at school		
Boarder at school	56.9%	71.5%
Day scholar	43.1%	28.5%
Living arrangements during school vacation		
Both parents	64.5%	63.3%
Single parent	20.1%	19.0%
Relatives or siblings	11.1%	11.4%
Non-relatives	4.3%	6.3%
Location of residence for past 5 years		
Rural	13.1%	24.7%
Urban	86.9%	75.3%
Religion		
Catholic	30.8%	33.1%
Moslem	4.0%	6.8%
Protestant	56.5%	52.7%
No religion	1.1%	1.9%
Other	7.6%	5.5%
Age: mean (SD) [range]	16.3 (1.40) [12–25] years	16.8 (1.57) [12–24] years

### *Prevalence and characteristics of sexual behavior*

Eleven percent of females ( $n = 190$ ) and 50% of the males ( $n = 946$ ) reported ever having had sexual intercourse. Table 2 summarizes the sexual behavior of sexually experienced respondents. The median age at first intercourse was 15 years for females and 13 years for males. The median age of the first sexual partner was much older for female (18 years) than for male (14 years) respondents. The proportion of students reporting using condoms was low and did not differ by gender. The main difference between male and female respondents was the number of sexual partners reported. Approximately 60% of sexually experienced females and only 35% of males

Table 2  
Sexual behavior of sexually experienced respondents

Variable	Females ( <i>N</i> = 190)	Males ( <i>N</i> = 946)
Lifetime number of sexual partners ( <i>n</i> = 175 females; 894 males)		
One	60.6%	34.5%
Two	15.4%	18.5%
Three	9.7%	12.2%
Four	5.1%	8.5%
Five or more	9.1%	26.4%
Ever used condoms ( <i>n</i> = 188 females; 941 males)	54.8%	53.8%
Respondents who reported condom use at last intercourse ( <i>n</i> = 177 females; 891 males)	40.7%	40.4%
Self-reported frequency of condom use ( <i>n</i> = 156 females; 836 males)		
Always	28.8%	27.2%
Most of the time	12.8%	13.6%
Some of the time	13.5%	10.0%
Not very often	11.5%	11.2%
Never	33.3%	37.9%
Age at sexual debut: mean (SD)	13.7 (3.64) years	12.5 (3.60) years
Age of sexual partner during first intercourse: mean (SD)	17.7 (4.73) years	13.4 (4.37) years

Sample sizes differ due to missing responses

stated that they had one sexual partner. Nine percent of sexually experienced females and 26% of males mentioned having five or more lifetime sexual partners.

#### *Characteristics of students who reported sexual behavior*

Bivariate analyses were conducted to compare those reporting previous sexual activity and those who had never had sex. Table 3 illustrates the proportion of sexually experienced respondents by categorical demographic characteristics, while Table 4 summarizes the results of the comparisons between the groups on continuous variables.

#### *Demographic characteristics of the student, the school and the family*

As expected, males and females who were sexually experienced were older than those reporting no prior sexual activity. The effect sizes for mean age differences between students who reported having had sexual intercourse and those who did not (males,  $d = 0.54$  and females,  $d = 0.52$ ) were moderate (Cohen, 1992) (Table 4)

The proportion of students reporting sexual intercourse also varied by whether the school was national or provincial, whether the school was single gender or co-educational, and whether the student was a day scholar or boarder. National schools recruit students from all provinces and usually have the first pick in selecting students based on scores in the national primary school-leaving examinations. Students attending provincial schools had significantly greater odds of reporting sexual activity than those in national school ( $OR_{unadj} = 2.41$ ; 95% CI, 1.42–4.09;  $p = 0.001$  for females and  $OR_{unadj} = 2.54$ ; 95% CI, 2.07–3.13;  $p < 0.001$  for males). Students

Table 3  
Proportion of sexual experienced respondents by categorical demographic characteristics according to gender

Variable	Female			Male		
	% <sup>a</sup>	OR <sub>unadj</sub>	95% CI for OR <sub>unadj</sub>	% <sup>a</sup>	OR <sub>unadj</sub>	95% CI for OR <sub>unadj</sub>
All respondents	11.0			50.0		
Class level						
Form 1 (9th grade)	6.5	0.35***	0.22–0.58	40.1	0.38***	0.29–0.50
Form 2 (10th grade)	11.3	0.65*	0.42–0.99	47.8	0.52***	0.40–0.68
Form 3 (11th grade)	13.3	0.78	0.52–1.18	50.9	0.59***	0.45–0.77
Form 4 (12th grade)	16.4	1.00		63.8	1.00	
National or provincial school						
National	5.7	1.00		33.6	1.00	
Provincial	12.7	2.41***	1.42–4.09	56.3	2.54***	2.07–3.13
Type of school						
Single gender	9.5	1.00		44.1	1.00	
Mixed gender	20.9	2.53***	1.81–3.54	64.8	2.34***	1.90–2.88
Day scholar or boarder						
Boarder at school	8.8	0.55***	0.40–0.74	46.2	0.60***	0.49–0.73
Day scholar	15.0	1.00		58.9	1.00	
Living arrangements during school vacation						
Both parents	10.1	0.41**	0.23–0.76	46.1	0.54**	0.36–0.80
Single parent	11.0	0.46*	0.23–0.89	52.7	0.70	0.46–1.08
Relatives or siblings	17.0	0.76	0.38–1.51	55.8	0.79	0.50–1.26
Non-relatives	21.4	1.00		61.4	1.00	
Location of residence for past 5 years						
Rural	17.2	1.77**	1.20–2.62	53.7	1.24*	1.00–1.53
Urban	10.5	1.00		48.4	1.00	
Socio-economic status (wealth quartiles)						
1 (Poorest quartile)	17.1	1.00	0.35–0.82	53.9	1.00	0.68–1.15
2	9.9	0.54**	0.37–1.13	50.8	0.88	0.49–0.85
3	11.8	0.65	0.31–0.65	43.0	0.65**	0.67–1.10
4 (Richest quartile)	8.4	0.44***		50.1	0.86	
Religiosity						
Low or medium low	12.1	1.09	0.75–1.60	60.4	1.75***	1.39–2.19
Medium high	12.3	1.11	0.70–1.76	48.6	1.08	0.79–1.48
High	11.2	1.00		46.7	1.00	

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

<sup>a</sup> Row percentages. For example, 6.5% of female students in Form 1 had engaged in sexual intercourse.

attending co-educational schools had significantly greater odds of reporting sexual activity than students in single-gender schools (OR<sub>unadj</sub> = 2.53; 95% CI, 1.81–3.54;  $p < 0.001$  for females and OR<sub>unadj</sub> = 2.34; 95% CI, 1.90–2.88;  $p < 0.001$  for males).

Females who were boarders at school had significantly lower odds of reporting sexual activity than their peers who were in day schools (OR<sub>unadj</sub> = 0.55; 95% CI, 0.40–0.74;  $p < 0.001$ ). The same was true from males (OR<sub>unadj</sub> = 0.60; 95% CI, 0.49–0.73;  $p < 0.001$ ). Previous research suggests

Table 4  
Comparison of sexually experienced and not sexually experienced students by gender

Variables	Females			Males		
	Sexually experienced	Not sexually experienced	Effect size (Cohen's <i>d</i> )	Sexually experienced	Not sexually experienced	Effect size (Cohen's <i>d</i> )
	Mean (SD)	Mean (SD)		Mean (SD)	Mean (SD)	
<b>Sociodemographic factors</b>						
Age	16.9 (1.38)	16.2 (1.38)	0.52***	17.2 (1.56)	16.4 (1.46)	0.54***
<b>Socio-cultural factors</b>						
Gender role attitudes (adult)	34.8 (9.11)	32.5 (9.60)	0.25**	37.2 (8.45)	35.4 (8.44)	0.22***
Parental attitudes towards sex	2.8 (1.09)	2.5 (0.85)	0.25**	3.4 (1.28)	2.9 (1.06)	0.44***
<b>Personal factors</b>						
Other risk behavior	4.7 (1.72)	3.9 (0.98)	0.57***	5.3 (2.18)	4.2 (1.22)	0.62***
HIV/AIDS knowledge	10.0 (2.23)	10.2 (2.26)	-0.07	10.0 (2.17)	10.1 (2.05)	-0.06
Perceived risk of STI	7.7 (3.63)	6.8 (3.41)	0.28***	6.7 (3.23)	6.4 (3.20)	0.08
Gender role attitudes (self)	25.5 (6.95)	23.7 (6.61)	0.25**	32.2 (7.95)	29.7 (7.22)	0.32***

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

that young people living with one or both parents are less likely to engage in sexual intercourse (Kiragu, 1991). To assess whether living arrangements were associated with sexual activity among young people, students were asked to report whom they usually lived during school vacations. Respondents living with both parents during school vacations had significantly lower odds of being sexually experienced than those living with other non-relatives such as friends ( $OR_{unadj} = 0.41$ ; 95% CI, 0.23–0.76;  $p = 0.004$  for females and  $OR_{unadj} = 0.54$ ; 95% CI, 0.36–0.80;  $p = 0.002$  for males).

#### *Behavioral and cognitive characteristics*

Twenty-three percent of females and 13% of males stated that they had never engaged in any of the risk behaviors not directly related to sexual practices while one female and six males stated that they engaged in all seven activities often. Close to 50% of females and 60% of males engaged in at least one of the behaviors sometimes or often. Other drugs reportedly used by students included cocaine, heroine, mandrax, khat, and kuber. Khat (*Catha edulis*), widely known in Kenya as miraa, is a stimulant that grows naturally in the Eastern Province of Kenya. Miraa can produce hallucinations and lead to manic behavior, hyperactivity, and suicidal depression (U.S. Drug Enforcement Agency, 2007). Kuber is a powdery substance imported from India that is usually dissolved in hot water and drunk or chewed to produce a 'high' (Onyango, 2002). Approximately 7% of males and females who were sexually experienced reported that they smoked cigarettes *often* compared to 1% of female and 2% of male students who had never had sexual intercourse. Further, 16% of females and 19% of males who were sexually experienced reported frequent beer consumption compared to 2% of females and 4% of males who had never had sexual intercourse. Forty-seven percent of females and 54% of males who had never had

sexual intercourse engaged in at least one the seven risk behavior *often* or *sometimes* compared to 57% of females and 75% of males who were sexually experienced. In summary, students who were sexually experienced engaged in other risk behaviors with greater frequency than those who had never had sexual intercourse. The effect sizes of the differences in frequency (males,  $d = 0.62$  and females,  $d = 0.57$ ) were moderate (Cohen, 1992).

HIV/AIDS knowledge was relatively high and did not differ by gender or sexual experience. On average, students correctly answered 10 of the 15 questions measuring HIV/AIDS knowledge. For males, there was also no difference between the groups in perceived risk of STD infection. Females who were sexually experienced had significantly greater perceived risk of STD infection than those who were not sexually experienced; however, the effect size of the difference was small ( $d = 0.28$ ) (Cohen, 1992). Students who reported prior sexual activity had stronger support for distinct male and female roles than those who were not sexually experienced. However, the effect sizes of the differences in gender role attitudes (males,  $d = 0.32$  and females,  $d = 0.25$ ) were small (Cohen, 1992). Religiosity was not associated with sexual activity among females. Among males, over 90% of those who stated that they did not belong to any religious organisation were sexually experienced. Males professing low or medium low religiosity had greater odds of reporting sexual activity than males professing high religiosity (OR<sub>unadj</sub> = 1.78; 95% CI, 1.34–2.35;  $p < 0.001$ ).

#### *Socio-cultural factors*

On average, sexually experienced respondents reported stronger perceived adult support for distinct male and female roles than those who were not sexually experienced. However, the effect sizes of the differences (males,  $d = 0.22$  and females,  $d = 0.25$ ) were small (Cohen, 1992). Sexually experienced respondents also reported more permissive parental attitudes towards safer sex and condom use than those who were not sexually experienced (Table 4). The effect sizes of the differences in parental attitudes towards sex and condom use were greater for males ( $d = 0.44$ ) than females ( $d = 0.25$ ).

#### *Multivariate analyses*

In the multivariate regression model, the relation between the independent variables and sexual activity was supported (model for females  $\chi^2(36, N = 1209) = 94.14, p < 0.001$ ; model for males  $\chi^2(36, N = 1350) = 248.02, p < 0.001$ ). The regression model correctly classified 88.3% of the female respondents and 68.7% of the male respondents as either sexually experienced or inexperienced. Table 5 presents the adjusted odds ratios (OR<sub>adj</sub>),  $p$ -values, and 95% confidence intervals for the odds ratios for variables included in the logistic regression models.

Engaging in other risk behavior was not included as an explanatory variable in the logistic regression model because the same variables that influence sexual behavior may influence a young person's decision to engage in other risk behavior. Likewise, perceived risk of STIs was not considered an explanatory variable since prior sexual behavior may influence perceived risk of infection.

For both males and females, increasing age was associated with greater odds of reporting previous sexual activity (OR<sub>adj</sub> = 1.34; 95% CI, 1.07–1.67;  $p = 0.010$  for females and OR<sub>adj</sub> = 1.34; 95% CI, 1.17–1.53;  $p < 0.001$  for males). Increasing perception of permissive parental attitudes towards sex and condom use was also associated with greater odds of sexual activity among both males and females. Other factors varied by gender.

Table 5

Associations between sociodemographic, socio-cultural, personal factors and sexual experience from multivariate logistic regression analyses

Variables	Female		Male	
	OR <sub>adj</sub>	95% CI for OR <sub>adj</sub>	OR <sub>adj</sub>	95% CI for OR <sub>adj</sub>
<i>Personal factors</i>				
Gender role attitudes (self) <sup>a</sup>	1.00	0.96–1.04	1.01	1.00–1.03
HIV/AIDS knowledge	0.98	0.89–1.08	1.04	0.97–1.11
Religiosity (ref. high)				
Low	1.07	0.67–1.70	1.40*	1.03–1.90
Medium	1.19	0.67–2.10	0.94	0.61–1.42
<i>Socio-cultural factors</i>				
Parental attitudes towards sex <sup>b</sup>	1.25*	1.02–1.53	1.34***	1.21–1.49
Gender role attitudes (adult) <sup>a</sup>	1.02	1.00–1.04	1.02**	1.01–1.04
<i>Sociodemographic variables</i>				
Age	1.34*	1.07–1.67	1.34***	1.17–1.53
Provincial school (ref. national school)	2.17	0.83–5.64	1.84	0.95–3.59
Co-educational school (ref. single-gender school)	0.47	0.04–5.49	1.70	0.82–3.55
Day scholar (ref. boarder)	5.71*	1.09–29.82	1.09	0.62–1.92
Living arrangements (ref. other)				
Both parents	0.44*	0.20–0.97	0.55*	0.31–0.99
Single parent	0.41*	0.18–0.96	0.68	0.37–1.27
Siblings or other relatives	0.55	0.22–1.34	0.68	0.35–1.32
Rural residence (ref. urban residence)	1.63	0.89–2.98	1.27	0.92–1.75
SES (ref. poorest quartile)				
2	0.79	0.46–1.35	1.09	0.75–1.56
3	0.95	0.46–1.94	0.97	0.65–1.44
4 (Richest quartile)	0.76	0.43–1.34	1.60*	1.09–2.37

<sup>a</sup> Increasing values reflect: stronger attitudes that support that males and females have separate roles.

<sup>b</sup> Increasing values reflect: supportive caregiver attitudes towards sex and condom use.

Female day scholars were over five times more likely to report that they had ever had sexual intercourse than female boarders. Living in a two- or a single-parent home was protective against sexual intercourse compared to living with non-relatives, such as friends. No other variables were significantly associated with sexual activity among females.

Males professing low religiosity had significantly greater odds of sexual activity than those professing high religiosity. Increasing perception that adults support separate male and female gender roles was also associated with a greater likelihood of reporting sexual activity. As with females, living with both parents was protective for sexual activity when compared to those living with non-relatives. Last, males who were classified in the richest SES quartile were about two times more likely to report that they had ever had sexual intercourse than those in the poorest quartile.

## Discussion

Consistent with previous school-based research conducted in Kenya (Kiragu, 1991; Pattullo et al., 1994), the present study found that a greater proportion of males (50%) than females (11%)

reported prior sexual activity. It is plausible that males may over report their sexual behavior while females may underreport their sexual behavior due to societal expectations of female virginity at marriage coupled with greater acceptance of sexual mobility among males both prior to and during marriage (Akwara et al., 2003; Baylies, 2000). Second, the secondary school enrolment ratio for females in Kenya is relatively low (36%) (UNFPA, 2005). Thus, by limiting the study to school-going youth, it is likely that the female participants represent a group of young people who are significantly different from the general female adolescent population. For example, in-school females may be inclined to abstain from sexual intercourse because unplanned pregnancies and other negative consequences of sexual activity would impede the achievement of educational and career goals. Further, pregnant females may have dropped out from school, thus, reducing the numbers of female students reporting sexual activity. The most recent KDHS, which includes a nationally representative sample found that 63% of females aged 15–24 years have had sexual intercourse (CBS, MOH, & ORC Macro, 2004).

Engaging in risk behavior such as drinking alcohol, going to discos, or smoking was associated with an elevated likelihood of sexual experience for both males and females. Several studies have reported the co-occurrence of sexual activity and other risk behaviors, such as substance use (Bauni & Jarabi, 2000; Kiragu & Zabin, 1993; Siziya et al., 2008; Taylor, Dlamini, Kagoro, Jinabhai, & de Vries, 2003; Wilson, Manual, & Lavelle, 1991). This means that certain behaviors may be jointly influenced by personal or contextual factors. The coupling of risk behaviors and sexual activity among the youth has been the impetus for HIV prevention campaigns that address other risk behaviors, such as alcohol abuse.

Contrary to expectations regarding gender differences in condom use, males were no more likely than females to have ever used condoms or have used them at last intercourse. These findings are noteworthy as prior research in other African settings (Bertrand, Makani, Djunghu, & Niwembo, 1991; Volk & Koopman, 2001; Wilson et al., 1991) indicates that condom use tends to be higher among males both in terms of consistent condom use and ever having used condoms. Again, limited opportunities for advanced formal schooling among Kenyan females relative to males (Mensch et al., 2001) may mean that in-school females have greater proclivity to use condoms to avoid the negative consequences of unprotected intercourse on academic achievement. Further, compared to out-of-school females, in-school females may come from economically advantaged households and may be less likely to adhere to societal norms that reinforce male–female power differentials in sexual relationships. Previous research has shown that economic and power differentials in sexual relationships are associated with unsafe sexual behaviors (Luke, 2003, 2005; Varga, 2003).

Comparison of the mean age at sexual debut and the mean ages of sexual partners shows that males were more likely to have sexual partners who are their age, while females first engaged in sexual intercourse with males who were, on average, 4 years older. The age asymmetry between young females and their sexual partners may have important implications for the practice of safer sex. Previous studies indicate that a significant age difference between sexual partners (with the male being older) is associated with a lower likelihood of protected sexual intercourse (Kordoutis, Loumakou, & Sarafidou, 2000; Luke, 2005).

Schools are a potentially important contextual factor influencing young people's sexual behavior because they typically represent the most important socialization setting outside of the family (Mensch et al., 2001). Schools may, for example, function as a medium through which

societal norms on gender roles are reinforced through instructional modes and materials. Co-educational schools, in particular, may also provide young people with the opportunity to engage in sexual intercourse by providing close contacts between boys and girls. Conversely, schools may provide young people with adequate supervision to deter high-risk behavior. Both males and females attending national schools were less likely to report previous sexual activity than their peers in provincial schools. As mentioned earlier, the student population in national schools represents the country's top academic performers. This may create an academically competitive environment that essentially raises the severity of the consequences of early initiation of sexual activity and pregnancy. Indeed, previous research has found that academic success or valuing academic achievement is associated with a lower likelihood of having intercourse at a young age (Aras, Semin, Gunay, Orcin, & Ozan, 2007; Chewing et al., 2001; Kiragu, 1991).

Whether a student is a day scholar or boarder may also have some influence on sexual behavior. Boarding school students in Kenya usually spend an entire school term away from their homes; therefore, the influence of the school environment may be greater for youth attending boarding schools. Students who were boarders were less likely to report sexual activity. Most boarding schools are single-gender; thus, students in these schools may be less likely to have opportunities to have sexual contacts. Further, while fewer adults may be responsible for a large group of students in boarding schools, this adult-to-child ratio may represent greater supervision if, day students live in homes where parents are working all day and have less time to monitor their children's activities.

Sexual behavior is mediated by gender role ideologies, which dictate expected codes of conduct within relationships (Varga, 2003). Young people construct their conceptualization of masculinity and femininity from their social environment. Increasing perception that adults in one's community hold gender attitudes supporting separate roles for males and females was associated with greater odds of being sexually experienced. Previous studies conducted in Africa have found masculinity to be associated with sexual prowess (Buve, Bishikwabo-Nsarhaza, & Mutangadura, 2002; MacPhail & Campbell, 2001; Schoepf, 1995). Sexual health campaigns may, therefore, benefit from including an educational component addressing the association between gender role ideologies and sexual behavior.

The present study has some limitations. The study utilized a cross-sectional design; therefore, causal inferences cannot be made. The findings from this study cannot be generalized to out-of-school adolescents, who may engage in higher rates of sexual activity (Babalola et al., 2005; Karim et al., 2003; Mathews et al., 2008; Pettifor et al., 2008). Due to logistical constraints, this study was also limited to students attending schools in and around Nairobi, an urban centre. Young people in rural areas may have lower exposure to Western media and have stronger ties to their ethnic groups and, thus, be more likely to adhere to traditional sexual norms (Brockman, 1997). Thus, further studies should expand this research to include more rural schools and include samples of young people who are outside of the school system.

Certain characteristics of the school environment, such as having a gender-neutral environment (Mensch et al., 2001), that might have an important bearing on young people's behavior may have been overlooked. However, this study provides unique information about school-level factors that might affect the initiation of sexual activity among the youth.

As a result of the sensitivity of the information sought from participants, self-report bias must be considered. To curtail this problem, students were informed that they were not obligated to

participate in the study or to answer all questions. Students were also assured that all responses would be anonymous and in most cases teachers left the classrooms during data collection.

In summary, the findings of this study suggest that sexual activity among adolescents is influenced by multiple factors operating at various levels, including the school environment. Moreover, the pattern of association differs for males and females. These results have several implications for sexual health policies and programs targeting the youth. First, young people may benefit more from comprehensive sex education programs that address multiple risk factors than from prevention efforts that aim to increase HIV/AIDS awareness alone. In fact, the present study found no significant difference in HIV/AIDS knowledge levels between those who reported prior sexual activity and those who did not. Second, gender differences should be taken into account when designing educational programs. Third, as formal schooling becomes more widespread, further investigation on the association between the school environment and youth behavior is warranted.

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