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Examination of Behavioral, Social, and Environmental Contextual Influences on Sexually Transmitted Infections in At Risk, Urban, Adolescents and Young Adults

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Abstract

Background—Despite the large body of extant literature on sexually transmitted infections (STIs) in adolescents and young adults (AYAs), more research on social and environmental contextual factors is needed. Also, further examination of STI indicators by gender remains a critical area of research focus.

Methods—Anonymous survey data were collected using ACASIs in community venues in urban, low-income, STI prevalent, U.S. neighborhoods to reach AYAs, aged 12–24 years. Conventional descriptive statistics, bivariate analysis, and multiple logistical regression models were used to assess indicators of a self-reported lifetime prevalence of STIs.

Results—Participants (N=1,540) were on average 20.6 years; 57.2% were women, the majority were racial and ethnic minorities (92%), and almost half (49.2%) identified as sexual minorities. Nearly one-third (32.%) had 1 STIs. As expected, gender differences were identified. For AYA men, being African American/Black, moving residences > four times since kindergarten, and having a history of HIV testing were each positively associated with STIs. Also, those who strongly disagreed that many young people in their community exchanged sex for money had a significantly lower likelihood of having an STI. For AYA women, exchanging sex for drugs or money, lacking money, which prevented activities, and using marijuana were each associated with STIs.

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Conclusions—This research extends our understanding of social and environmental contextual influences on AYAs' risk for STIs. It highlights differences in risk exposures that are distinctly different for AYA women and men, suggesting the need for tailored interventions to address their unique economic needs and social challenges.

Keywords

Sexually transmitted infections; adolescents and young adults; social and environmental risk factors; financial hardship; gender disparity

INTRODUCTION

Sexually transmitted infections (STIs) are among the most prevalent and costly health problems within the United States. Adolescents and young adults (AYAs), aged 15–24 years, have the highest burden of reported STIs, reflecting half of the estimated 20 million new cases diagnosed annually [1]. Among AYAs, young women, racial and ethnic minorities, and young men who have sex with men (MSM) are disproportionately affected by STIs [2–4].

National surveillance, other population-based studies [5–7], and numerous other scientific studies have identified risks associated with STIs in AYAs, including sociodemographic risk markers such as younger age [5,8,9], female gender [5,10,12,15], racial and ethnic identity (African American/Black, Hispanic/Latino)[5,10,14], and sexual minority status (lesbian, gay, bisexual, transgender) [5,7,16,17]. Research has also identified sexual behaviors (e.g., exchange of sex for drugs or money) [5,9,12,15–19], alcohol and other substance use [5,17–20], and perceived negative peer norms [21] as risk factors for STIs. These factors are well established with relative consistency in findings across studies. However, increasingly, researchers have called for broader perspectives to account for social determinants and environmental influences on STI risk and acquisition [22,23]. As such, a growing body of research has examined social, environmental, and other contextual factors associated with STI-related risk among AYAs, including influences related to housing instability or homelessness [19,24,25], unemployment [26], and exposure to community violence [27]. Yet, there is still limited research focused specifically on social-environmental contextual influences related the acquisition of STIs among AYAs [13,26].

Despite the large body of extant literature on STIs in AYAs, further examination of highly relevant social and environmental contextual factors, which may provide further insights into their influences on STIs during adolescence and young adulthood. Also, given the significant gender disparities in STIs further examination of indicators of STIs by gender remains an important area of research focus. Thus, the goal of this present research was to examine sociodemographic risk markers, behavioral risk factors, social, and environmental contextual factors as well as gender differences associated with a self-reported lifetime prevalence of STIs (hereafter referred to as STIs) in AYAs residing in high STI prevalent urban neighborhoods. We assessed the relative influence of a number of factors known to be associated with STIs among AYAs, including ones that are not reflected in any single study in current literature. To extend current research, we included a number of other variables including age-appropriate measures of financial hardship to take into account the influence

of factors related to housing instability and income vulnerabilities [19, 24–26]. A measure of Internet use to meet sexual partners was also included based on increasing evidence regarding STI risk and use of the Internet to extend reach beyond one's immediate neighborhood and social network [28]. Lastly, we included measures on STI-related health-seeking behaviors to assess the extent to which these influenced STIs [29]. We hypothesized that these indicators would be significantly associated with a lifetime prevalence of STIs. Such basic research is needed to provide information for the tailored development of effective interventions to stem the tide of STIs in at risk AYAs.

MATERIALS AND METHODS

Study Design and Procedures

Data were collected through the Connect to Protect (C2P) program, a local community mobilization effort of the Adolescent Medicine Trials Units (AMTUs) of the ATN Adolescent Medicine Trials Network for HIV/AIDS Interventions (ATN). Detailed information about C2P has been published elsewhere [29]. In 2012 and 2013 each AMTU (see Table 1 for a complete list) collected anonymous survey data using audio computer-assisted self-interview (ACASI) technology that was available in English and Spanish. Completion of the survey took, on average, 60 minutes depending on participants' responses and skip patterns that were built into the ACASI. AYA-focused community-based venues were selected through a multi-step process, including use of publicly available data and geographic information software to map health, crime, STIs, and demographic information to guide the selection of target groups and community venues. All AMTUs focused on low-income, urban neighborhoods with high rates of STIs in AYA. Seven venues targeted AYA MSM and seven targeted AYA women. The venues that targeted young men typically included clubs or bars where they socialize while those that targeted young women typically included community organizations that were geographically close to home, fulfilled a basic need, or served as a source of social connectedness (see [30] for a detailed description of the venue selection process and types of venues each AMTU targeted).

After the venue selection process was completed study staff conducted outreach at each targeted venues at varying times to screen, recruit, and consent participants until each AMTU reached their predetermined target sample size (ranging between 120–160). Although the types of venues targeted varied (e.g., youth-serving organizations, bars, community centers), the screening and recruitment procedures were standardized across all AMTUs. The Institutional Review Boards of each AMTU approved all local procedures including remuneration to participants in gift cards or cash ranging between \$20 and \$50, and a waiver of signed consent to protect participants' anonymity.

Study Participants

For the overall study, eligible participants were AYA, aged 12–24 years, who engaged in any type of consensual sexual behavior (i.e., oral, anal, or vaginal sex) over the 12-month period prior to survey administration. For purposes of this analysis, participants were included only if they responded “yes” or “no” to the question, “In your lifetime, have you ever had a sexually transmitted infection (STI), also known as a sexually transmitted disease (STD)?”

Participants who identified as transgender were excluded from this analysis due to a small sample size.

Measures

Sociodemographic Characteristics included participants': (1) Age; (2) Gender; (3) Ethnicity; (4) Race; (5) Sexual Orientation; (6) School Status; and (7) Employment (full- or part-time) status. For purposes of this analysis participants' Age was dichotomized in the following manner: 13 to 19 = 0, 20 to 24 = 1. Although this dichotomization does not fully take into account the needs and challenges of adolescents at each developmental stage, it allows us to assess whether STIs were more prevalent among adolescents than young adults. Each sociodemographic variable was included in the analytic models as potential indicators of STIs.

Financial Hardship assessed separate age-appropriate measures of economic disadvantage for AYAs, including history of residential mobility, current living situation, lifetime homelessness, dependence on others for monetary resources, and lacking money to participate in activities.

Residential Mobility assessed the number of times participants moved residences since kindergarten. Among our participants, the average was 5.61 times (SD 6.5), with a median of 4 times (range of 0 to 50 times). Thus, based on the median score this variable was recoded as follows: 0 times = 0; 1 to 4 = 1; 5 to 50 = 2.

Current Living Situation measured participants' living situation: (1) "your own house or apartment;" (2) "at your parent(s) house or apartment;" (3) "at another family member(s) house or apartment;" (4) "at someone else's house or apartment;" (5) "foster home or group home;" (6) "in a rooming, boarding, halfway house, or a shelter/welfare hotel;" (7) "on the street(s) (vacant lot, abandoned building, park, etc.);" (8) "some other place not mentioned." This variable was recoded in the following three categories: 1 = "Your own house or apartment"; 2 = "Living at your parents or family"; and 3 = "Other living arrangements."

Lifetime Homelessness examined participants' history of homelessness, defined as having to stay one night or more in a place that was not their home because they could not stay in their home or did not have a home.

Monetary Dependence on Others measured participants' primary source of income: (1) parents or other family members; (2) person having sex with; (3) own job; (4) friends; or (5) other. A dichotomous variable was created to determine whether their primary source of money was through their own job or reliance on others.

Lack of Money Prevented Participation in Activities evaluated whether a lack of money prevented participants from participating in activities in the past year.

Lifetime Risky Sexual Partnerships measured whether participants: (1) ever had sex with someone who injects drugs; (2) ever exchanged sex for drugs or money; (3) ever had sex with someone who was suspected of having HIV; and (4) ever had sex with someone who

you knew had HIV, or who you now know has HIV. Each item was considered separately as a potential indicator of STIs.

Lifetime Prevalence of Alcohol and Drug Use assessed whether participants: (1) ever had more than just a few sips of alcohol; (2) ever smoked marijuana (weed, herb, blunts, pot, joints, etc.), other than just trying a few puffs; and (3) ever used any kind of drug that was not prescribed for you by a doctor or other health care provider, not including marijuana or over the counter medications (available in stores without prescription). Each item was considered separately as a potential indicator of STIs.

Use of Internet to Meet Sex Partners was a single item that assessed whether participants ever used the Internet to meet potential sex partners.

Crime Victimization was a single item that examined whether participants were victims of a crime in the past year.

Perceived Peer Norms included items that reflect risk perception among peers: (1) in my community, many young people exchange sex for money; (2) in my community, a lot of young people have sex with older; (3) my friends know how to keep themselves safe from HIV and AIDS; and (4) condoms are widely used by young people. Each item was considered separately as a potential indicator of STIs.

Access to STI Screening and Treatment Services assessed whether participants had any of the following experiences: (1) have a healthcare provider that you see at least one time a year; (2) your healthcare provider routinely ask you about your sexual health; (3) healthcare provider routinely offer testing for HIV and STIs; (4) in the past year, have you gone to a clinic, a private doctor's office, emergency room or any other type of health care facility to check or get treated for sexually transmitted infections (STIs), also known as sexually transmitted diseases (STD); and (5) ever tested for HIV. Each item was considered separately as a potential indicator of STIs.

Lifetime Prevalence of STIs measured participants' response to a single question: "In your lifetime, have you ever had a sexually transmitted infection (STI), also known as a sexually transmitted disease (STD)?" For this analysis, this was the outcome measure of interest.

Data Analyses

Prior to conducting statistical analyses, missing data patterns were examined to determine whether data were substantial, and if so, missing at random. To describe the participants, basic univariate descriptive statistics, including frequency distributions and means were used. A Chi-square test was used to assess bivariate associations between sociodemographic risk markers, behavioral risk, social, and environmental contextual factors, as well as gender differences, associated with STIs. Population-averaged multiple logistical regression models were conducted to examine factors associated STIs while controlling for the potential clustering effect of AMTU sites. Variables included in the final logistic regression models were purposefully selected using a stepwise selection in the following order on the basis of their proximal risk to STIs¹: sociodemographics (e.g., age, race, etc.), financial hardship,

sexual risk behaviors, perceived norms, access to STI screening and treatment services, and substance use behaviors. For the variable selection process, variables were removed from the model if the p-value > 0.20. Similarly, year of assessment was included to examine possible differences in the lifetime prevalence of STIs. One model included all study participants. Two other models separately evaluated study participants by gender. For comparison purposes all three models included the same potential indicators. The estimates from the logistical regression models are reported as adjusted odd ratios (AOR) with 95% Confidence Intervals (CI). A conventional 0.05 Type I error threshold was employed for statistical significance for all analyses. All analyses were conducted using Stata 14.2 statistical software package (Stata Corporation, College Station, TX).

RESULTS

Participants Characteristics

Across all AMTUs 1,925 study participants were eligible for this analysis. Of these individuals 385 were excluded due to missing data on key study variables for an analytic sample of 1,540 (80.0%) participants. Participants' sociodemographic characteristics are shown in Table 1. As noted, we identified statistically significant differences by gender among all sociodemographic variables. As shown in Table 2, 32.6% of participants reported a lifetime history of STIs and many had behavioral risk and exposure to other social and environmental vulnerabilities with a number of statistically significant gender differences identified. Bivariate analysis of STIs and potential indicators were performed. Most of the factors were significantly associated STIs ($p < .10$), with the exception of the two indicators, Monetary dependence on others and Healthcare providers routinely asked you about your sexual health (data are not shown); both variables were retained in further analyses because of the significant gender differences identified.

Factors Associated Lifetime Prevalence of Self-Reported STIs

Results of the multiple logistic regression analyses are shown in Table 3. Only the variables with a p-value ≤ 0.20 were included in the final models. Several indicators were significantly positively associated with STIs for the overall sample, including: being African American/Black, 20–24 years of age, identifying as female, lacking money for participation in activities, moving residences more than four times since kindergarten, exchanging sex for drugs or money, engaging in sex with an HIV infected person, perceiving that many young people do not widely use condoms, not receiving an STI check in the last year, having a history of HIV testing, and lifetime use of marijuana, and other non-prescription drugs. As expected, gender differences in indicators of STIs were identified. Specifically, for AYA men, being African American/Black (AOR=1.68, CI=1.07, 2.62), moving residences more than four times since kindergarten (AOR=2.43, CI=1.18, 5.04), and having a history of HIV testing (AOR= 3.86, CI =1.29, 11.5) were each positively associated with STIs. Among AYA men, 3% strongly disagreed that many young people exchanged sex for money in their community; these participants had a significantly lower likelihood of having an STI than

¹The results of the stepwise regression analyses were compared with a model including all variables concurrently and the models were identical, indicating that order of variable selection did not alter the results.

their counterparts (AOR=0.31, CI=0.10, 0.92). Variables that were significantly associated with STIs for AYA women, but not for AYA men included: engaging in risky sexual partnerships such as exchanged sex for drugs or money (AOR=2.69, CI=1.51,4.78), experiencing financial hardship such as a lack of money, which prevented activities (AOR=1.8, CI=1.32, 2.46], and using marijuana (AOR=1.98, CI=1.43, 2.74).

DISCUSSION

The primary goal of this analysis was to examine sociodemographic risk markers, behavioral risk, social, and environmental contextual factors, as well as gender differences, associated with STIs in AYAs residing in low-income, urban, neighborhoods with high rates of STIs. Using a community-venue recruitment approach, we identified a diverse sample of participants whose social and environmental context revealed a number of strengths and protective factors, but also presented opportunities for a number of risk exposures. Although a sizeable number of our participants were stable (e.g., in school, employed, had access to preventative healthcare), others experienced unemployment and financial hardship. Nearly one-third (32.%) of our participants were diagnosed with one or more STIs over the course of their lifetime as indicated by their self-reports. This remarkably high prevalence far exceeds the 9.2% prevalence of chlamydia, gonorrhea, or trichomoniasis [13], and the 4.6% prevalence of chlamydia [26] identified in national ADD Health studies of young adults. As expected, we identified differences in STIs by gender with a significantly higher proportion identified among AYA women (35.4%) compared with (28.1%) AYA men. This finding is consistent with current literature and national guidelines to screen sexually active AYA women for prevalent STIs annually [1,2]. However, there are no equivalent guidelines for sexually active AYA men, which may, in part, explain the higher rate of infection among AYA women.

Overall, our findings show that for both AYA men and women, STIs were associated with older age, non-prescription drug use, and sexual partner selection (i.e., sex with HIV infected person). While the finding on age seemingly contradicts previous findings related to higher rates of STIs among adolescents [5,8,9], given our focus on lifetime risk factors and prevalence of STIs it is not surprising that the cumulative effect resulted in a significantly higher rate of STIs among our young adult participants. The correlation between substance use and STIs is well documented with evidence of its disinhibiting effects on sexual risk behaviors [5,17–20]. Similarly, the association between risky sexual partnerships and STIs is well established in the literature on AYA men and women [5,9,12,15–19]. However, regarding the significant association identified between HIV testing and STIs, it is unclear whether testing was a single event performed in the context of a routine healthcare visit or a repeat event to monitor HIV risk. As such further research on the role of HIV testing in the context of STI prevention is warranted.

Several indicators of STIs among AYA women were distinctly different from those identified among AYA men. That is, experiencing financial hardship and exchanging sex for money or drugs were uniquely associated with STIs among AYA women, indicating that a lack of monetary resources, and transactional sex plays key roles in exposing young women to STIs. Further research that leads to the development of targeted interventions to address the role of

gendered powerlessness (e.g., income inequities) in AYA women's sexual decision-making and STI risk is sorely needed to reduce their risk for STIs.

For AYA men, being African American/Black and experiencing residential mobility four or more times since kindergarten were indicators of STIs. These findings are consistent with previous research indicating associations between African American/Black race [3–5] and unstable housing [19,24,25] and STIs. It is also well documented that unstable housing is consequence of low socioeconomic status, which is associated with increased sexual risk and STIs. While structural determinants of health such as housing is not easily remedied, there is evidence that by helping AYA men address this aspect of their lives will help to improve their overall quality of life including their sexual health.

Overall, this research contributes to the literature in a number of ways. First, it supports our hypothesis regarding the associations of sociodemographic risk markers, behavioral risk factors, and social, and environmental contextual factors as well as gender differences in the prevalence of STIs among AYAs. Our findings also support the call for broader conceptual frameworks that account for individual agency in AYA's sexual and substance use decision-making and subsequent behaviors, social influences within the family and peer networks as well as environmental and other contextual influences such as poverty [23]. However, future research that employs longitudinal research methods and a broader and deeper examination of other contextual influences on STIs in AYA is clearly needed. Moreover, our findings support the need for the further gender-based research to better understand the unique economic needs and social challenges for AYA women that are distinctly different for AYA men. Such research will likely provide insights into specific leverage points on which to intervene in each group. It also underscores the need for further examination of risk exposures in AYAs with a particular focus on influences such as access to monetary resources and access to sexual and reproductive healthcare that will provide opportunities for risk reduction counseling and education, screening for at risk behaviors and asymptomatic infections, referral to specialized health services to address related health needs (e.g., substance misuse and abuse, mental health problems), and social and community services to address broader social challenges (e.g., homelessness, transportation access, unemployment).

A number of limitations of this research should be noted. We employed a nonprobability recruitment approach with a cross-sectional methodological design so causal conclusions regarding identified correlates of lifetime STIs cannot be inferred. Moreover, data were collected from targeted urban community venues in low-income neighborhoods, thus, our findings may not be generalizable to AYAs who do not frequent or rarely frequent the selected venues or who reside in non-urban or higher income communities. Additionally, all data including our measure of STIs were reported by the participants with no means of verifying the data, which may have introduced some biased responses. Moreover, this measure does not provide insights into which STIs were most prevalent among our participants. Despite these limitations, this research contributes to a growing body of research that extends our understanding of social and environmental contextual influences on AYAs' risk and acquisition of STIs particularly as it relates to gender differences related to financial hardship, transactional sex, and residential mobility.

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Table 1
Distribution of Sociodemographic Characteristics Among Study Participants, and by gender (N= 1,540)

Characteristic	N = 1540	Valid Percent	Males n=659	Valid Percent	Females n=881	Valid Percent	Gender differences p-value
Age							
13 to 19 years old	502	32.6	147	22.3	355	40.3	<0.001
20 to 24 years old	1,038	67.4	512	77.7	526	59.7	
Hispanic/Latino Ethnicity							
Hispanic/Latino	318	20.6	163	24.7	155	17.6	0.001
Non-Hispanic/Latino	1222	79.3	496	75.3	726	82.4	
Race							
Other	440	28.6	285	43.25	155	17.6	<0.001
African American/Black	1100	71.4	374	56.75	726	82.4	
Sexual Orientation							
Heterosexual	755	49.0	12	1.8	743	84.3	<0.001
Gay/Lesbian	466	30.3	451	68.4	15	1.7	
Bisexual	265	17.2	169	25.6	96	10.9	
Other (not sure, undecided, don't know)	54	3.5	27	4.2	27	3.1	
School Status							
Not in school	676	43.9	360	54.6	316	35.9	0.001
In school	864	56.1	299	45.4	565	64.1	
Employment Status							
Currently employed (part-time or full-time)	782	50.8	261	39.6	497	56.4	<0.001
Unemployed	758	49.2	398	60.4	384	43.6	
Year of Assessment							
2012	729	47.3	274	41.6	455	51.7	<0.001
2013	811	52.7	385	58.4	426	48.3	
Adolescent Medicine Trials Unit (AMTU) Sites							
Baltimore, MD *	92	5.9					

Characteristic	N = 1540	Valid Percent	Males n=659	Valid Percent	Females n=881	Valid Percent	Gender differences p-value
Boston, MA *	84	5.4					
Bronx, NY	133	8.6					
Chicago, IL	109	7.1					
Denver, CO *	105	6.8					
Detroit, MI *	80	5.2					
Houston, TX	123	7.9					
Los Angeles, CA	102	6.6					
Memphis, TN	135	8.8					
Miami, FL	143	9.3					
New Orleans, LA	136	8.8					
Philadelphia, PA *	91	5.9					
Tampa, FL *	102	6.6					
Washington, DC *	105	6.8					

* AYA Male sites

Distribution of Risky Sexual Partnerships, Financial Hardship, and Other Contextual Factors Among Study Participants, and by gender (N= 1,540)

Table 2

Characteristic	N = 1540	Valid Percent	Males n=659	Valid Percent	Females n=881	Valid Percent	Gender differences p-value
Life Prevalence of STIs							
	497	32.3	185	28.1	312	35.4	<0.001
Financial Hardship							
Current Living Situation							
Own house or apartment	504	32.7	211	32.0	293	33.3	0.001
At parents or other family member's house	797	51.8	320	48.6	477	54.1	
Other Living Situation	239	15.5	128	19.4	111	12.6	
Lack of Money Prevented Participation in Activities	811	52.7	363	55.1	448	50.9	> 0.05
Monetary Dependence on Others	852	55.3	297	45.1	555	63.0	<0.001
Residential Mobility (range 0 to 50 times since kindergarten)							
None	189	12.3	82	12.5	107	12.1	<0.001
One to four times	670	43.5	264	40.1	406	46.1	
More than four times	680	44.2	312	47.4	368	41.8	
Lifetime Homelessness	437	28.4	248	37.6	189	21.5	<0.001
Lifetime Risky Sexual Partnerships							
Sex with Injection Drug User	94	6.1	75	11.4	19	2.2	<0.001
Exchanged Sex for Drugs or Money	226	14.7	141	21.4	85	9.7	<0.001
Sex with Someone Suspected of HIV	261	17.0	210	31.9	51	5.8	<0.001
Sex with HIV infected Person	186	12.1	166	25.2	20	2.3	<0.001
Use of Internet to Meet Sex Partners	483	31.4	412	85.3	71	14.7	<0.001
Lifetime Alcohol and Drug Use							
Ever Alcohol Use	1208	78.4	561	85.1	647	73.4	<0.001
Ever Marijuana Use	910	59.1	441	66.9	469	53.2	<0.001
Ever Use of Other Drugs	249	16.2	160	24.3	89	10.1	<0.001
Victim of a Crime	288	18.7	171	26.0	117	13.3	<0.001
Perceived Peer Norms							

Characteristic	N = 1540	Valid Percent	Males n=659	Valid Percent	Females n=881	Valid Percent	Gender differences p-value
Many Young People Exchange Sex for Money	582	37.8	238	36.1	344	39.1	> 0.05
A Lot of Young People Have Older Partners	721	46.8	275	41.7	446	50.6	<0.001
Friends Know How to Keep Safe from HIV/AIDS ^a	469	30.5	211	32.0	258	29.3	<0.001
Condoms are Widely Used by Young People ^a	184	12.0	74	11.2	110	12.5	<0.001
Access to STI Screening and Treatment Services							
Have Healthcare Provider See 1/Year	1178	76.5	471	71.5	707	80.2	<0.001
Healthcare Provider Routinely Ask About Sexual Health	1211	78.6	483	73.3	728	82.6	<0.001
Healthcare Provider Routinely Offer STI/HIV Testing	1912	72.7	460	69.8	659	74.8	0.029
Checked for STIs/STDs in Past Year	812	52.7	355	53.9	457	51.9	>0.05
Ever Tested for HIV	1274	82.7	584	88.6	690	78.3	<0.001

Note. All factors were associated with Lifetime Prevalence of STIs (p = 0.10), with exception of the variables *Monetary Dependence on Others*, and *Healthcare Provider Routinely Ask You About Your Sexual Health*.

^aPercept represents the distribution of participants that strongly agree with the statement.

Table 3

Multivariate Logistic Regression Estimates for the Factors Associated with Lifetime Prevalence of Sexually Transmitted Infections Among Study Participants: Overall Model and Stratified by Gender (N= 1,540)

	All Participants (N=1539)		Males (n=659)		Females (n=854)	
	AOR	95% CI	AOR	95% CI	AOR	95% CI
Sociodemographic characteristics						
Current gender (male reference)	1.00		n/a		n/a	
Female	3.3 ^{***}	[2.27, 4.79]	--	--	--	--
Age						
13 to 19 years old	1.00		1.00		1.00	
20 to 24 years old	1.52 ^{**}	[1.13, 2.05]	1.9 [*]	[1.06, 3.40]	1.77 ^{**}	[1.27, 2.49]
Race					n/a	
Others	1.00		1.00		--	--
African American/Black	1.79 ^{***}	[1.29, 2.47]	1.68 [*]	[1.07, 2.62]	--	--
Financial Hardship						
Lack of Money Prevented Participation in Activities						
No	1.00		1.00		1.00	
Yes	1.67 ^{***}	[1.30, 2.16]	1.44	[0.94, 2.19]	1.8 ^{***}	[1.32, 2.46]
Residential Mobility (range 0 to 50 times since kindergarten)					n/a	
None	1.00		1.00		--	--
One to four times	1.39	[0.90, 2.16]	1.49	[0.70, 3.19]	--	--
More than four times	1.8 ^{**}	[1.15, 2.79]	2.43 [*]	[1.18, 5.04]	--	--
Lifetime Risky Sexual Partnerships						
Exchanged Sex for Drugs or Money						
No	1.00		--	--	1.00	
Yes	1.53 [*]	[1.06, 2.21]	--	--	2.69 ^{**}	[1.51, 4.78]
Sex with Someone Suspected of HIV					n/a	
No	1.00		1.00		--	--

	All Participants (N=1539)		Males (n=659)		Females (n=854)	
	AOR	95% CI	AOR	95% CI	AOR	95% CI
Sex with HIV infected Person						
Yes	1.43	[0.95, 2.14]	1.63	[0.96, 2.75]	--	--
No	1.00		1.00		1.00	
Yes	2.48 ***	[1.56, 3.93]	2.41 ***	[1.40, 4.13]	4.87 *	[1.41, 16.75]
Perceived Peer Norms						
Many Young People Exchange Sex for Money or Drugs	n/a		n/a		n/a	
Strongly Agree	--	--	1.00		--	--
Agree Somewhat	--	--	1.01	[0.60, 1.69]	--	--
Don't know/Unsure	--	--	0.86	[0.50, 1.46]	--	--
Disagree Somewhat	--	--	0.71	[0.25, 2.00]	--	--
Strongly Disagree	--	--	0.31 *	[0.10, 0.92]	--	--
Condoms are Widely Used by Young People ^a			n/a		n/a	
Strongly Agree	1.00		--	--	--	--
Agree	1.32	[0.81, 2.14]	--	--	--	--
Disagree	1.72 *	[1.11, 2.66]	--	--	--	--
Strongly Disagree	1.97 ***	[1.22, 3.20]	--	--	--	--
Access to STI Screening and Treatment Services						
Have Healthcare Provider See >1/Year			n/a		n/a	
No	1.00		--	--	--	--
Yes	0.79	[0.59, 1.07]	--	--	--	--
Healthcare Provider Routinely Ask About Sexual Health	n/a					
No	--	--	1.00		1.00	
Yes	--	--	0.50 ***	[0.32, 0.80]	1.55	[0.99, 2.43]
Checked for STIs/STDs in Past Year						
No	1.00		1.00		1.00	
Yes	2.85 ***	[2.19, 3.71]	2.66 ***	[1.71, 4.12]	3.25 ***	[2.34, 4.51]
Ever HIV Tested					n/a	

	All Participants (N=1539)		Males (n=659)		Females (n=854)	
	AOR	95% CI	AOR	95% CI	AOR	95% CI
No	1.00		1.00		--	--
Yes	3.44 ***	[2.14, 5.50]	3.86 *	[1.29, 11.5]	--	--
Lifetime Alcohol and Drug Use						
Ever Marijuana Use						
No	1.00		1.00		1.00	
Yes	1.85 ***	[1.41, 2.44]	1.57	[0.96, 2.57]	1.98 ***	[1.43, 2.74]
Ever Use of Other Drugs						
No	1.00		1.00		1.00	
Yes	2.35 ***	[1.65, 3.35]	2.22 **	[1.40, 3.53]	2.34 **	[1.38, 3.96]
Wald X2	263.75		118.20		124.52	
Prob > X2	<0.001		<0.001		<0.001	

Note. AOR = adjusted odds ratio; CI = confidence interval; n/a = not applicable because it was not included in the regression model. GEE, population averaged models, taking into account clustering by site. The variables kept in the models had a p-value less than 0.20.

* <.05,

** <.01,

*** <.001.