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Sexual Health Knowledge in a Sample of Perinatally HIV-infected and Perinatally-exposed Uninfected Youth

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Abstract

This study describes sexual health knowledge in perinatally HIV-infected (PHIV+) and perinatally-exposed uninfected (PHIV-) ethnic-minority youth, ages 9–16 years, residing in NYC (n=316). Data on youth sexual health knowledge (e.g., pregnancy, STDs, birth control) and caregiver-adolescent communication about sexual health were examined. Participants in both groups answered only 35% of the sexual health knowledge questions correctly (mean=6.6/19). Higher scores were found among youth who reported more communication about sex with caregivers (vs. those who did not report talking about sex with caregivers; 8.54 vs. 5.84, $p<.001$) and among PHIV+ youth who were aware of their status (vs. PHIV+ youth who were not; 7.27 vs. 4.70, $p<.001$). Age was positively correlated with sexual health knowledge ($\beta=.489$, $p<.001$). Both PHIV+ and PHIV- youth had poor sexual health knowledge, suggesting a need for sexual health education for both groups. Data suggest that interventions focused on caregiver-child risk communication may be important for prevention.

Keywords

STD knowledge; perinatal infection; adolescents; HIV

With advances in medical treatment, the number of perinatally HIV-infected (PHIV+) children aging into adolescence and young adulthood is increasing significantly, both in the United States (U.S.) and globally (Center for Disease Control & Prevention [CDC], 2010; World Health Organization [WHO], 2010). In New York City (NYC), where this study is located, approximately 79% of PHIV+ youth were 13 years or older by the end of 2011 (New York State Department of Health and Mental Hygiene [NYSDOHMH], 2012). Adolescence is a period of sexual exploration and sexual risk, and although some PHIV+ youth are delaying sex, several studies of PHIV+ youth suggest that, like many adolescents, they are initiating sexual activity early (Bauermeister, Elkington, Brackis-Cott, Dolezal, & Mellins, 2009; Ezeanolue, Wodi, Patel, Dieudonne, & Oleske, 2006) and engaging in other risk behaviors such as sex with multiple partners (Bauermeister, Elkington, Robbins, Kang, & Mellins, 2012) and unprotected sex (Tassiopoulos et al., 2013) that increase their risk for transmitting HIV as well as contracting other sexually transmitted diseases (STDs).

Furthermore, there are environmental and familial factors that may increase the likelihood of PHIV+ youth engaging in unprotected sex. In the U.S., the majority of PHIV+ youth reside in impoverished, inner-city areas, with high rates of violence, substance abuse, family disruption, and neighborhood stress (Duncan & Raudenbush, 1999; Gonzalez-Guarda et al., 2011), all of which have been associated with higher rates of sexual risk behaviors in youth (Browning, Leventhal & Brooks-Gunn, 2005; Cubbin, Santelli, Brindis, & Braveman, 2005). These factors are further exacerbated by the biopsychosocial impact of HIV (e.g., cognitive effects of HIV, increased mental health problems), making PHIV+ youth particularly vulnerable to sexual health risk behaviors that may compromise their health and result in acquisition of other STDs (Bauermeister et al., 2008; Battles & Weiner, 2002).

Acquisition of STDs in HIV populations is of particular concern, as STDs can accelerate HIV disease progression (White, Gorrill, & Khalili, 2006) and lead to adverse health outcomes such as infertility and cancer (NYSDOHMH, 2010). Additionally, people living with HIV may be susceptible to reinfection with treatment resistant strains of HIV, particularly if they have other STDs complicating their treatment and health outcomes (Cohen, 2004; Cohen, Hellmann, Levy, DeCock, & Lange, 2008; Taiwo, 2009). Moreover, STDs in people living with HIV can increase the risk of HIV transmission to others (CDC, 2008; Torian et al., 2010).

PHIV+ youth living in NYC and engaging in sexual risk behaviors may be a particularly vulnerable group at high risk for acquisition for STDs. Teens in general make up more than 1 in 4 diagnosed STD cases in NYC (NYSDOHMH, 2010), thus increasing the potential for transmission via sexual partners. Also, drawing from adult studies, findings reveal that people living with HIV are at higher risk for acquiring other STDs (Cohen, 2004; Scheer, Chu, Klausner, Katz, & Schwarcz, 2001; Whiteside, Merchant, Hussey, Adams, & Duffus, 2013).

Despite these risks, to date there are few studies of PHIV+ youth that have focused on STDs and STD knowledge. The few existing studies have focused on general sexual and reproductive health knowledge (e.g., pregnancy and contraception) in this population. In one

of the few studies on knowledge of sexual and reproductive health in HIV+ adolescents that included perinatally- infected and transfusion- infected youth, participants reported limited knowledge regarding sexual health. The investigators of this study suggested that practitioners should utilize medical visits to maximize youth knowledge of sexual risk factors and reinforce the practices of safe sex, such as condom use (Wiener, Battles, & Wood, 2007).

In addition to providers, parents and caregivers can play a critical role in promoting the sexual health of their child (Donenberg & Maryland, 2005). Previous studies with uninfected youth have found that caregiver-youth communication is associated with improved youth STD and pregnancy knowledge (Aspy et al., 2007; Fisher, 1986; Fox & Inazu, 1980). Although knowledge by itself is not sufficient for significantly reducing risky behavior (Hillier, Warr, & Haste, 1998), it is a necessary component of many effective behavioral/educational interventions designed to promote safe sexual behavior (Shrier et al., 2001).

Creating evidence-based prevention programs geared toward HIV+ individuals and those who live in areas where HIV is highly concentrated is part of the national HIV/AIDS strategy (White House Office of National AIDS Policy, 2010). To date, there are few if any evidence-based HIV prevention programs for PHIV+ youth. In order to inform prevention programs for this population, a critical first step is learning about population-specific needs in sexual health education, particularly among youth living at one of the epicenters of the HIV epidemic (i.e., NYC).

To our knowledge, the current study is the first to focus on the sexual health knowledge of PHIV+ youth, including knowledge of STDs, the relationship between HIV and other STDs, pregnancy, and other reproductive health issues. Moreover, this study compares the sexual health knowledge scores of PHIV+ youth to those of uninfected youth from similar sociodemographic communities in NYC, namely a cohort of perinatally HIV-exposed, but uninfected (PHIV-) youth. PHIV- youth are in many ways an ideal comparison group because, with the exception of the youth's HIV status, their sociodemographic and family characteristics (including maternal HIV) are similar, allowing us to explore the role of youth's HIV infection in influencing youth knowledge of sexual health, birth control, and pregnancy (Mellins et al., 2009).

Using data from a relatively large cohort study of PHIV+ adolescents, we a) examined the sexual health knowledge of PHIV+ youth, b) compared the sexual health knowledge of PHIV+ youth to a comparison group of PHIV- youth, and c) examined sociodemographic and family variables associated with sexual health knowledge in the full sample.

Methods

Participants and Procedures

Cross-sectional data were drawn from the baseline interviews of a longitudinal study examining mental health and behavioral risk outcomes in PHIV+ and PHIV- youth, Project CASAH (Child and Adolescent Self Awareness and Health Study). The participants were

recruited between 2003 and 2005 from four medical centers in NYC providing primary and tertiary care to children and families affected by HIV, including PHIV+ and PHIV– children. Inclusion criteria for study participation were as follows: a) youth ages 9 to 16 years with perinatal exposure to HIV, b) cognitive capacity to complete interviews, c) English or Spanish speaking, and d) caregiver with legal capacity to sign consent for the youth's participation (foster parents cannot consent for child participation in behavioral research in NYC). Among 443 eligible participants, providers could not contact 6%, and 11% refused contact with researchers. A total of 367 participants (83%) were approached, of whom 340 (92%) were enrolled, and 325 caregiver-youth dyads completed the full baseline interview session (2 visits). This study focuses on the reports of 316/325 youths (191 PHIV+ and 125 HIV–) who completed the section on sexual health knowledge. Sexual health knowledge data is missing from 9 participants (ages 10–13 years): eight of their parents/caregivers refused to have their children complete questionnaires on sexual and reproductive health (5 of these youth were HIV+ who had not been formally told their HIV status), and one youth (age=10 years) completed only 7/19 questions, refusing to complete the rest of the questionnaire. Institutional Review Board approval was obtained for this study, and caregivers provided written consent for all youth; youth provided written assent, and monetary compensation was provided.

Measures

Demographic information was collected on youth age, gender, race/ethnicity, HIV status, and HIV status disclosure. Other information obtained included caregiver type (e.g., biological parent vs. relative/non-relative) and age, income, education, and caregiver HIV status.

Child sexual health knowledge was assessed using a 19-item questionnaire assessing basic knowledge on STDs, including HIV transmission and pregnancy prevention, e.g., “Condoms help prevent HIV,” “Missing a period is a sure sign that a woman is pregnant,” and “A woman can always tell when a man has an STD.” Adolescents answered each item “True,” “False,” or “Unsure.” For every correct answer, youth scored one point; high scores indicated better knowledge about sexual health. Possible score range was 0–19.

Caregiver-youth communication was assessed through a questionnaire administered to children about their conversations with their caregivers (Krauss, 1995). This questionnaire was originally developed to assess changes resulting from a parent-child HIV prevention program focused on improving family communication (Krauss, 1995). The participant was asked about the occurrence and frequency of conversations in the last month between the caregiver and child on each of 14 topic areas (e.g., sports, friends), including sex, STDs, and birth control. Each caregiver and youth were individually and separately asked about if and when they had discussed these topics with each other. Sample questions include, “Did you talk with your [caregiver/youth] for any length of time about sex in the last month? If yes, how many times?” This approach was used for each topic (e.g. friends, sports, STDs/ pregnancy, birth control, etc.). A dichotomous variable was calculated indicating whether the child reported discussing sex, STDs, or birth control in the past month.

Statistical Analysis

All data analyses were performed using SPSS. Associations between STD/pregnancy knowledge scores and independent variables were assessed using linear regressions. Secondary regressions were conducted when significant associations were found to determine if the associations were maintained after adjusting for age, given the relatively large age range in this sample and the association of age with sexual health knowledge in this study, as well as other research (Bachanas, et al., 2002; Clark et al., 2002).

Results

Sample demographics and characteristics (Table 1)

Youth were primarily African-American (45%) and Latino (40%) with a mean age of 12.6 years (SD= 2.3; range = 9–16), and evenly split by gender. Sixty percent were PHIV+, 72% of whom were aware of their HIV status. Forty-five percent of youth were living with an HIV+ caregiver (almost all of whom were the birth mothers) and in homes where the mean annual income was between \$20–\$25,000.

STD knowledge and HIV status

On average, youth in both groups answered only 35% of questions correctly (mean = 6.6 correct answers out of 19 total items), with no HIV status group differences in total sexual health knowledge scores (PHIV+ M= 6.56, SD= 4.04; PHIV– M= 6.74, SD = 4.73, $\beta = -.021$, $p = .704$). Among PHIV+ youth, those who were aware of their status had significantly higher scores compared to those who had not been formally told their diagnosis (M= 7.27, SD = 4.11 vs. M= 4.70, SD = 3.20, $\beta = .286$, $p < .001$).

There were some differences when comparing responses to specific items between the two groups, as shown in Table 3, in which frequency of correct responses to each of the 19 individual knowledge items for the total sample, and separately by PHIV status, are presented. When compared to PHIV– youth, a significantly lower percentage of PHIV+ youth knew that one could acquire HIV and another STD at the same time (30% vs. 18%; $p = .028$). However, PHIV+ youth were significantly more knowledgeable than PHIV– youth on two items: withdrawal during sex does not prevent pregnancies (32% vs. 21%; $p = .039$) and using a douche after sex does not prevent HIV transmission (36% vs. 24%; $p = .026$).

Sociodemographic and family communication correlates associated with HIV knowledge (Table 2)

The majority of demographic variables were not associated with total sexual health knowledge scores, including youth's gender and race, youth and caregiver HIV status, and caregiver's age, highest education level, income, and relationship to child (biological parent vs. other caregiver). Youth age was the only sociodemographic variable associated with the total sexual health knowledge score, with older children having higher scores ($\beta = .489$, $p < .001$).

Youth who reported talking about sex, STDs, or birth control with their caregivers in the past month had significantly higher sexual health knowledge scores than those who did not

report talking with their caregivers about these topics ($M = 8.54$, $SD = 4.20$ vs. $M = 5.84$, $SD = 4.13$; $\beta = -5.26$, $p < .001$). To test whether the association between STD/pregnancy knowledge and youth-caregiver sexual health communication was a function of the child's age, a regression was conducted including age as a covariate. Knowledge scores continued to be significantly associated with youth-caregiver communication, even after adjusting for youth's age ($OR = 1.08$; 95% $CI = 1.00-1.15$; $p = .039$).

Sexual behavior and STD knowledge

Twelve percent (37/316) of the youth in our sample reported that they had ever had vaginal or anal sex at baseline. Youth who had initiated sex had higher STD knowledge scores than the participants who did not report sexual initiation (9.89 vs. 6.20; $\beta = .275$, $p < .001$). However, this association fell short of statistical significance after adjusting for age ($\beta = .860$, $SE = 1.27$, $p = .052$). Among those who had engaged in vaginal or anal sex, 43% reported having engaged in unprotected sex. Mean STD knowledge scores were similar for those who had unprotected sex and those who had not (9.69 vs. 10.05, respectively), and the difference between the two groups was not statistically significant, even if adjusting for age.

Discussion

Overall, both PHIV+ and PHIV- youth in the sample scored poorly on the sexual health knowledge questionnaire. This deficit in knowledge is of particular concern for both groups, given the high rates of STDs in the NYC neighborhoods where the youth our study reside (NYCDOHMH, 2009), and given that these youth are reaching adolescence, an age of increased sexual experimentation and potential engagement in HIV/STD risk behaviors. For PHIV+ youth, STDs not only can accelerate the progression of the HIV disease and compromise other health outcomes (White et al., 2006), but they also can increase chances for HIV-transmission to others (CDC, 2007). PHIV- youth are not only at risk for STDs, but given that STDs can increase susceptibility for HIV infection (NYSDOHMH, 2009; CDC, 2007), PHIV- youth are also at risk for their own acquisition of HIV, considering the high HIV sero-prevalence rates in their communities (e.g., Bronx, NY; El-Sadr Mayer, & Hodder, 2010).

This study also highlights the important role of parent-child communication in influencing youth sexual health knowledge. The youth in both groups had significantly higher sexual health knowledge scores when they reported having had conversations with their caregivers regarding sexual health, including sexual behavior, STDs, and birth control, even after adjusting for age, a finding consistent with prior studies of parent-child sexual communication (Aspy et al., 2007; Fisher, 1986; Fox & Inazu, 1980). Previous studies have called for family-based interventions that promote communication about sexual and reproductive health, and some studies have found that family-based services that support families affected by HIV, including both maternal and pediatric HIV, can improve parent-child relationships and promote communication about difficult topics such as sexuality, sexual risk, and familial HIV (Bhana, McKay, Mellins, Petersen, & Bell, 2010; Donenberg & Maryland, 2005; McKay et al., 2003; Rotheram-Borus, Murphy, Miller, & Draimin, 2008).

Similarly, we found that among PHIV+ youth, those who had been formally told about their HIV status had significantly better sexual health knowledge scores than both PHIV+ youth who had not been formally told about their diagnosis and PHIV– youth. It is possible that the disclosure of HIV to infected youth results in more communication between youth and their caregivers, as well as with providers. This supports recommendations for disclosure of HIV status to youth before adolescence and potential involvement in risk behaviors (Wiener, Mellins, Marhefka, & Battles, 2007). Once youth have been disclosed to, behavioral interventions with HIV+ youth and their caregivers may provide an avenue for exploring youth sexuality and promoting safe sexual health behaviors, before risk behaviors begin. HIV care providers who have regular contact with youth and families are in an ideal position to support and encourage these types of interventions and a number of studies have now called for the integration of behavioral and biomedical services for HIV+ patients. Although the pediatric HIV epidemic is virtually being eradicated in the U.S., this is not true internationally, particularly in low and middle income countries where there are 3.4 million children younger than 15 years estimated to be living with HIV (UNAIDS, 2013). Interventions such as CHAMP+, a family-based mental health and HIV Prevention program for perinatally HIV-infected early adolescents and their caregivers has now been successfully piloted in medical clinics in several countries including the U.S., South Africa, and Argentina (Bhana, McKay, Mellins, Petersen, & Bell, 2010; Bhana et al., 2013; McKay et al., in press) and may be a helpful tool in promoting family communication about safe sexual health behavior once the disclosure process has begun.

Also in accordance with previous studies (Bachanas et al., 2002; Clark, Sauter, & Kotecki, 2000; Clark et al., 2002), older youth in CASA were more knowledgeable about sexual health and pregnancy, although their mean score on sexual health knowledge was still low. A similar trend was found for youth who had initiated sex; however, this association fell short of significance after controlling for age. This may reflect greater access to sexual health information as youth grow older. Alternatively, older youth are more likely to be sexually active and thus to have been exposed to STDs. Those with an STD may be more knowledgeable due to their own experience rather than having received more formal education (Clark et al., 2002).

Interestingly, despite being linked to primary care systems, the PHIV+ youth in this study had surprisingly low knowledge about STDs, with several possible explanations. Providers of PHIV+ youth may be more focused on other pressing health issues, such as medication adherence and prevention of HIV transmission, and thus, they may provide limited information on other STDs or other general sexual health education topics to their emerging adolescent patients. Earlier in the HIV epidemic, when many of these youth were born, treatment options were limited, and many caregivers and health care providers did not expect PHIV+ children to survive childhood (Boyd-Franklin, Steiner, & Boland, 2001; Havens & Mellins, 2008). Thus, they may not have discussed sexuality, sexual risk behaviors, and sexual and reproductive health, including STDs (Havens & Mellins, 2008).

Furthermore, the stigma associated with HIV, combined with discomfort related to discussing sexual topics with youth, may have influenced decisions around communication about sex for both providers and parents/caregivers. We speculate that providers may be

reluctant to discuss sexuality and STDs due to concerns about parental disapproval or their own discomfort with discussing these topics with HIV+ children, despite practice guidelines that recommended such communication (Schuster, Bell, Petersen, & Kanouse, 1996). For caregivers of PHIV+ youth in this study, the majority of whom were adoptive HIV–caregivers, the usual discomfort associated with parent-child communication about sex may have been compounded by concerns about discussing family “secrets” such as adoption, parental acquisition of HIV, and factors associated with HIV transmission, such as history of drug use or infidelity (Davies et al., 2009; Havens & Mellins, 2008; Waugh, 2003).

Unfortunately, the current findings, consistent with other studies of uninfected youth (e.g., Silver & Bauman, 2006; Swenson et al., 2010), suggest that PHIV+ youth may learn about sexual health *after* they become sexually active rather than before, as is often recommended for prevention efforts (Downs, Bruine de Bruin, Murray, & Fischhoff, 2006). Parents/caregivers and primary physicians are well positioned to begin sexual health education *before* the child reaches sexual maturity. Since PHIV+ youth are connected to providers at a young age, their physicians have a unique opportunity to talk about sexual health, not just prevention of HIV transmission to others, before risk behavior begins. However, studies in other populations have found that, although some primary care providers discuss STDs with their patients (Woods et al., 2006), they only do so with sexually active youth (Chesson et al., 2004; Tilson et al., 2004), missing an important opportunity for prevention. To date, the literature is limited on how and to what extent providers of PHIV+ youth discuss sexual health. This study did not assess provider-youth STD communication, clearly an important area for future research.

As noted, PHIV– youth also had deficits in sexual health and pregnancy knowledge, consistent with several studies that found that uninfected youth, particularly those between the ages of 12–21 years, remain uninformed about STDs (Clark, Jackson, & Allen-Taylor, 2002; Kaiser Family Foundation, 2003). As with PHIV+ youth, the PHIV– youth were from families affected by HIV, and the majority lived with their HIV+ birth mothers. Therefore, it is possible that the stigma associated with maternal HIV infection may also negatively influence discussions of sexual health and pregnancy by HIV+ mothers with their PHIV– youth, particularly when mothers choose not to disclose their own HIV status to their children. Previous studies have found that HIV+ mothers avoid discussing safe sex for a multitude of reasons, such as embarrassment and fears of being unable to explain themselves clearly (Guilamo-Ramos, Jaccard, Dittus, & Collins, 2008); being judged for their past behaviors or experiences (Davies, Horton, Williams, Martin, & Stewart, 2009); unplanned disclosure and children revealing their parent’s diagnosis to others (Waugh, 2003); as well as concerns for the child’s well-being (Ostrom, Serovich, Lim, & Mason, 2006).

While PHIV+ youth have significant access to providers, PHIV– youth typically do not, and a number of studies have indicated high risk for emotional problems and sexual risk behaviors (Chernoff et al., 2009; Havens & Mellins, 2008; Mellins et al., 2011). Although the pediatric HIV epidemic is diminishing rapidly in the U.S., the population of uninfected children born to HIV+ mothers is not abating, given continued HIV transmission in women, with some U.S. cities (e.g., Washington, DC and Bronx, NY) having HIV seroprevalence rates similar to or higher than some parts of Africa (El-Sadr, Mayer, & Hodder, 2010),

clearly pointing out the need for prevention and intervention programs geared toward this population. Although implications for providers and parents of PHIV– youth in terms of increased communication are similar to PHIV+ youth, it may be more difficult to target this population, given that PHIV– youth are not easily identified in clinics or schools. Adult HIV clinics could help identify children born to HIV+ mothers and thus be a critical venue for targeting this population (Mellins et al., 2009).

There are several limitations to the study. Participants were recruited from HIV primary care clinics in NYC and may not reflect the larger population of PHIV+ and PHIV– adolescents, particularly those outside NYC and youth not followed in pediatric HIV clinics. Although we attempted to recruit both groups from similar communities based on the demographics of pediatric HIV disease, other factors (e.g., access to services) may have altered the group effects. Other limitations include issues related to self-report instruments (e.g., social desirability) and the use of cross sectional data. Also, with a mean age of 12 years, we had relatively few youth reporting sexual initiation. Although almost half of those who had initiated sex reported unprotected sex (16/37), we had limited power with which to examine the association of STD/pregnancy knowledge with unprotected sex. Furthermore, we don't inquire about youth's own history of STD infection, which may affect knowledge about STDs. Finally, we did not have a comparison group of youth unaffected by child or parental HIV, and thus it is unclear how these rates compare to the more general population of youth growing up in similar communities. Given that HIV/AIDS education in relation to condom use and the benefits of STD/HIV testing is limited in youth living in inner-city communities (Swenson et al., 2010), more general interventions on sexual health may be needed to strengthen prevention efforts.

Nevertheless, this is one of the only studies that we know of that evaluates the knowledge of PHIV+ youth about STDs as well as pregnancy and that compares their sexual health knowledge to that of uninfected youth from similar disadvantaged familial and sociodemographic backgrounds. The results indicate the need for sexual health education in both groups, particularly for PHIV+ youth who are more susceptible to contracting STDs (Cohen, 2004; Whiteside et al., 2013), for whom STDs increase the risk for secondary transmission of HIV to their partners (CDC, 2007), and for whom few evidence-based prevention programs exist. Our data also suggest that prevention interventions, which provide information about sexual health beyond just HIV infection, and which foster caregiver-child risk communication for PHIV+ and PHIV– adolescents, may be most effective.

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Table 1

Sample Characteristics

	Total sample (N=316)	PHIV+ youth (N=191)	PHIV- youth (N=125)	P-value ¹
<i>Youth Characteristics</i>				
	Mean (SD)	Mean (SD)	Mean (SD)	
STD Knowledge Score	6.63(4.32)	6.56 (4.04)	6.74(4.73)	.704
Age	12.62(2.26)	12.76(2.18)	12.41(2.36)	.178
	N (%)	N (%)	N (%)	
Female	158 (50%)	96 (50%)	62 (50%)	1.00
Latino ²	125 (40%)	68 (36%)	57 (46%)	.265
African American ²	143(45%)	88 (46%)	55 (44%)	
Sexually active	37 (12%)	19 (10%)	18 (14%)	.283
Engaged in Unprotected Sex ³	16(43%)	10(53%)	6 (33%)	.325
Living with biological Caregiver	151(48%)	65(34%)	86(69%)	<.001
Aware of HIV+ status		138(72%)		NA
Caregiver talked to youth about sex in past month	92(29%)	48(25%)	44(35%)	.058
<i>Caregiver Characteristics</i>				
	N (%)	N (%)	N (%)	
HIV+	142 (45%)	58(30%)	84(67%)	<.001
	Mean (SD)	Mean (SD)	Mean (SD)	
Age	48.45 (12.14)	49.81(11.85)	46.38(12.32)	.014
Education	11.62(3.21)	11.74(3.36)	11.43(2.96)	.396
Household income ⁴	5.57 (2.78)	5.94 (2.91)	5.01 (2.47)	.003

¹ P-values from t-tests for continuous variables and chi-square tests for dichotomous variables.

² 25 youth were “African-American & Latino” and 13 were “other.”

³ Percents are of those who were sexually active.

⁴ Income measured on a 12-point scale where 5 = \$20–25,000, 6 = \$25–30,000.

Table 2Sociodemographic variables and sexual health knowledge (N=316)¹

<i>Variables</i>	Beta	p-value
Female	.07	.216
African American	-.01	.869
HIV+	-.02	.704
Lives with biological parent	.04	.484
Caregiver HIV+	.06	.326
Discussed sex with caregiver	.28	<.001
Youth aware of HIV status (HIV+ only; N=191)	.29	<.001
Sexually active (Vaginal or anal sex)	.28	<.001
Ever had unprotected sex (Sexually active only; N=37)	-.04	.807
Youth Age	.49	<.001
Caregiver Age	.02	.787
Caregiver Education	.03	.596
Household Income	-.09	.108

¹ Betas and p-values from separate linear regression analyses for each variable predicting sexual health knowledge scores.

Table 3

Percent of correct answers from individual sexual health items by youth HIV status

STD/Pregnancy Knowledge Questions Correct answer	Total % of 316	PHIV+ % of 191	PHIV- % of 125	p
All birth control must be prescribed by a doctor. Correct answer = false	11	11	12	.716
During sex, if a man takes out his penis before cuming the girl may get pregnant anyway. Correct answer = true	18	17	20	.555
You can get an STD and HIV at the same time. Correct answer = true	23	18	30	.028
If a woman has an STD it can affect her chances of getting pregnant in the future. Correct answer = true	23	22	25	.587
Using two condoms at the same time gives you more protection against STDs and pregnancy. Correct answer = false	24	23	26	.506
Missing period is a sure sign that a woman is pregnant. Correct answer = false	26	27	24	.693
If the male pulls out before he cums, he cannot make the girl pregnant. Correct answer = false	28	32	21	.039
A douche after sex is a good method to prevent STDs. Correct answer = false	29	30	27	.613
If symptoms of an STD disappear, it means the person no longer has the disease. Correct answer = false	30	31	30	.901
A douche after sex is a good method to prevent HIV. Correct answer = false	31	36	24	.026
A douche after sex is a good method to prevent unwanted pregnancies. Correct answer = false	32	31	34	.624
A girl can get pregnant at almost any time during her period? Correct answer = true	37	34	42	.154
You can get an STD from having oral sex. Correct answer = true	39	37	42	.410
A man can always tell when a woman has an STD. Correct answer = false	48	48	49	.818
Condoms help prevent HIV. Correct answer = true	49	48	50	.819
Condoms help prevent STDs. Correct answer = false	50	48	54	.357
A woman can always tell when a man has an STD. Correct answer = false	51	50	51	.909
STDs require medical treatment. Correct answer = true	51	49	54	.422
Condoms help prevent unwanted pregnancies. Correct answer = true	62	64	60	.553