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Sexual risk behavior and STI health literacy among ethnic minority adolescent women

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Abstract

Although information is available for prevention of sexually transmitted infection (STI/HIV), adolescents continue to engage in high risk sexual behavior particularly ethnic minority adolescent women with histories of STI or abuse. A description therefore of STI/HIV knowledge and sexual risk behavior among these women is indicated for modification of prevention efforts for sexual health promotion. African-American (n=94) and Mexican-American (n=465) adolescent women 14–18 years of age were included in the study. Assessments of sexual risk behavior and STI/HIV knowledge among these adolescent women described Mexican-American women as at higher risk of STI, pregnancy, substance use and abuse with lower levels of STI/HIV knowledge, previous HIV testing and perceptions of risk than African-American women. A focus on Mexican-American adolescent women with histories of STI and abuse is indicated for translation of community-based health promotion interventions for amelioration of potential adverse sexual health outcomes among ethnic minority adolescent women.

Introduction

Ethnic minority adolescent women in the United States of America are disproportionately experience sexually transmitted infections (STI) including human immunodeficiency virus (HIV). African-American (AA) women are nearly 15 times more likely than non-Hispanic White women to be infected with HIV while Hispanic women are four times more likely than non-Hispanic White women to be infected. African-American and Hispanic women 15–19 years of age with a history of STI or sexual or physical abuse are at highest risk for STI including HIV compared to other ethnicities and older women (Centers of Disease and Prevention, 2010; Champion, 2011; Champion, & Collins, 2012; Freeman, 2010; Hou,

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2009). Assessment of knowledge concerning STI/HIV transmission and sexual risk behavior among ethnic minority adolescent women is important for provision of effective STI/HIV prevention efforts. The purpose of this study was to describe STI/HIV knowledge and sexual risk behavior among AA and Mexican-American (MA) adolescent women with a history of STI or abuse (sexual, physical or emotional). This information may be utilized for modification of HIV/STI sexual risk reduction interventions within community health care settings.

Background

Sexual risk behavior has been assessed among AA and Hispanic adolescent women with findings indicating early age of first sexual encounter and high numbers of sexual partners (Champion, 2011; Villarruel, Jemmott, & Jemmott, 2005), unprotected vaginal sex with steady partners, and lower levels of knowledge regarding condom usage despite high levels of STI/HIV knowledge (Crosby, et al, 2000; Jermott, Jermott, Braverman, & Fong, 2005). Brown, Lourie, Flanagan and High (1998) found lower use of condoms among AA and Hispanic adolescent women when hormonal contraception methods were used.

Hispanic adolescent women have been described as less likely to possess negotiation strategies related to barrier protection for the prevention of pregnancy and STI infections than their male counterparts (Tschann, et al, 2010). Tschann et al, (2010) also described suboptimal utilization of direct verbal and nonverbal communication as it relates to condom usage among Hispanic adolescent women. Stone (2002) identified high birth rates among Hispanic adolescent women between the ages of 15–19 years relative to other Black and non-Hispanic white adolescents. These findings reflect under-utilization of contraception among Hispanic adolescent women.

Sexual risk behaviors found to appreciably increase incidence of STI/HIV for ethnic minority women include partner characteristics, environmental factors, condom negotiation and contraceptive use and alcohol and substance use. Crosby, et al (2000) described an increased incidence of STI in adolescent AA men potentially increasing AA adolescent women's risk. Bralock and Koniak-Griffin (2007) examined the impact of sexual relationships and power on self-protective sexual behavior of AA adolescent women identifying involvement with older men and infrequent condom use among these women. Seth, et al (2011) found 38% of AA adolescents had sex while high on alcohol or drugs.

Sexual or physical abuse within adolescent intimate partner relationships is a factor impacting negotiating skills concerning sexual behavior (Raj, Silverman, & Amaro, 2004; Bralock & Koniak-Griffin, 2009; Maman, et. al., 2002). Childhood sexual abuse among AA and Hispanic adolescent women has been associated with sexual risk behaviors (i.e. early age first sexual encounter, multiple partners, older sexual partner) (Champion, 2011). These adolescents lack negotiating skills and power within their relationships placing them at a higher risk for STI/HIV (Salazar, et al, 2011; Crepaz, et al, 2009).

Although STI/HIV prevention information is available, adolescents continue to engage in high risk sexual behavior particularly ethnic minority adolescent women with STI or sexual or physical abuse histories (Abel & Chambers, 2004; Bralock & Koniak-Griffin, 2007;

Voisin et al, 2012). There is a paucity of data concerning STI/HIV knowledge among ethnic minority adolescents with STI or abuse. A description of STI/HIV knowledge and sexual risk behavior among ethnic minority adolescent women with a history of STI or abuse is indicated for modification of prevention efforts for sexual health promotion. The purpose of this study was to describe STI/HIV knowledge and sexual risk behavior among AA and MA adolescent women with a history of STI or abuse (sexual, physical or emotional). This information may be utilized for modification of HIV/STI sexual risk reduction interventions to improve efficacy within community health care settings.

Methods

This study was approved by the institutional review boards at The University of Texas Health Science Center and the San Antonio Metropolitan Health District (SAMHD), (Champion & Collins, 2012). Adolescent AA or MA women accessing care at the SAMHD STI or public health clinics who had either a STI or abuse (physical, sexual, emotional) history were referred for potential study participation. Eligibility was limited to English speaking women in order to maximize homogeneity across ethnic groups. Women who were 14–18 years old, had contact information and could be contacted were offered study participation. Study enrollment occurred over 26 months, beginning in July 2006 and ending in February 2008. Informed consent was obtained from participants or guardians/parents as appropriate. Parental consent was obtained, when either a parent or guardian accompanied the participant. Parental consent was not obtained when parents or guardians were not accompanying the participants. In this situation, the participants were seeking sexual or reproductive health care independently and therefore were considered an emancipated minor. Parental consent was not indicated in these situations. Following informed consent, research assistants interviewed participants at study entry via detailed self-report questionnaires describing demographics and psychosocial and situational factors associated with sexual risk behaviors including abuse, substance use, pregnancy, contraception and condom use and STI/HIV knowledge and beliefs. Participants were paid \$25 for completion of the study questionnaire (Champion & Collins, 2012).

Theoretical Framework

The AIDS Risk Reduction Model was utilized for this study (Catania, Kegeles, & Coates, 1990). This model provides theoretical and empirical explanatory power to assess the association between knowledge of STI/HIV transmission and sexual risk behavior for ethnic minority adolescent women with STI or abuse histories. The model has been adapted sequentially following extensive ethnographic fieldwork to guide research and questionnaire design among ethnic minority women including adolescents (Champion, & Collins, 2010; Shain, et al., 1999). It includes elements of several social psychological theories, including the Health Belief Model, self-efficacy theory, decision-making models, and diffusion theory (Fishbein & Ajzen, 1975; Fishbein et al., 1992). Three stages of the model include recognizing one's risk, making a commitment to reduce risk, and seeking and enacting solutions. Theoretically, passing from one stage to another requires social support and knowledge to attain change at each stage. Preliminary studies were conducted to provide insights concerning abuse and STI/HIV among AA and MA adolescent women and their

risk perceptions, values and beliefs, STI/HIV knowledge, sexual risk behaviors, sexual communication processes, sexual relationships and strategies for behavior change. These results were utilized for research and questionnaire design in this study (Champion, & Collins, 2010).

Instrumentation

The AIDS Risk Reduction Model was the basis for questions constructed to describe psychosocial and situational factors associated with sexual risk behavior and STI/HIV knowledge. Demographic (i.e. school dropout and number of children) and psychosocial (i.e. arrests, runaway, probation), and situational (i.e., pregnancy status, alcohol or substance use, abuse history) factors influencing sexual behavior (i.e., numbers of sexual partners and sexual activity) were constructed. These questions were constructed to characterize explanatory factors and their influence on sexual behavior variables (Beitchman et al., 1992). Most questions were created through previous work while others were adapted from established investigators (Champion, & Collins, 2010, 2011; Shain, et al., 1999).

Substance use was measured by questions on any use of marijuana, cocaine, crack, heroin, “uppers,” “downers” or alcohol. Condom use was assessed as current or ever use with past or current partners. Contraception use was also assessed as now or ever use for each contraceptive method. Sexual and physical abuse was assessed through self-report screening for any previous experience of physical, sexual and emotional abuse. The Abuse Screen (10 items, overall alpha .73) was developed for utilization with this population. Initial Principal Components factor analysis with varimax rotation produced two factors, a 6-item sexual abuse factor (Chronbach’s alpha .73) and a 4-item combined physical and psychological abuse factor (alpha .51). Sexual abuse was assessed with six questions “*Has anyone ever ... (a) made you have sex when you didn’t want to, (b) made you afraid to say no to sex, (c) knowingly hurt you during sex, (d) made you have sex without a condom, (e) had sex with you when you were high or out of control, and (f) forced you to do things you didn’t want to by threatening to hurt you?*” Physical abuse was assessed with two questions “*Has anyone ever ... (a) used a gun, knife or other weapon against you, and (b) hit you, held you down or tried to choke you?*” Psychological abuse was assessed with two questions “*Has anyone ever ... (a) constantly criticized you and put you down, and (b) acted with extreme jealousy*” (Champion, & Collins, 2010). Assessment of STI/HIV knowledge addressed attitudes and beliefs concerning STI/HIV risk associated with sexual behaviors. Questions were also included concerning knowledge of symptoms and treatment of STI/HIV (i.e. “... all STIs can be cured?” and “... a woman can have an STI without any symptoms at all?”).

Study procedures were established to ensure consistency in training and inter-rater reliability. Extensive instruction and training took place including observation and being observed by study staff while interviewing. Interviews for review were randomly selected throughout the study to ascertain completeness and internal consistency. Interviewers were women selected because of positive feelings about low-income minorities, courteous and warm affect and comfort with discussion of questions concerning sexual health. Interviewers provided consistent clarification of participant questions throughout the interview process to ensure comprehension (Champion, & Collins, 2010).

Statistical Analysis

The analytical processes utilized for this study included an examination of the data to describe and understand relationships among variables before proceeding to more complex levels of multivariable statistical models to perform tests of effects. Analyses included contingency tables, t-tests and chi-square analyses for description of the sexual risk behavior and STI/HIV knowledge and beliefs.

Results

Demographics

African-American (n=94, 16.8%) and MA (n=465, 83.2%) adolescent women 14–18 years of age were included in the study. Demographic characteristics are included in Table 1 with inclusion of descriptions by ethnicity. There was no difference in mean age between ethnicities. However, significantly more MA women were not in school or unemployed or had ever runaway. Significantly more MA women had ever used a birth control method. More MA women had been pregnant in the past while equivalent numbers of MA and AA women self-reported a history of STI.

Equivalent percentages of MA and AA women (87%) had experienced any abuse (Table 1). No significant differences were identified between MA and AA women concerning type of abuse including any sexual (AA 50%, MA 52%), physical (AA 45.7%, MA 48.7%) or emotional (AA 69.1%, MA 68.3%). A composite score for abuse indicated both MA and AA women had multiple experiences (AA 6.31, MA 6.99).

Sexual risk behavior

Mexican-American women reported significantly more sexual risk behaviors than AA women (Table 2). More MA women had not been previously tested for HIV. Of all women who did not have previous HIV testing, more MA than AA women indicated they did not obtain previous HIV testing because they did not perceive themselves as at risk. Mexican-American women reported significantly more sex with women, receptive anal sex, gave oral sex, participated in group sex, or had sex with an injection drug user than AA women. More MA women reported sex without a condom however this difference was not significant ($p=.070$). No differences between MA and AA women were noted for age at first sex, partner age at first sex, sex with friends for benefits, sex for money or drugs, sex with a bisexual man, sex to payback favors, sex with HIV partner or receiving oral sex.

The total number of substances used by both groups of women was high (Table 2). Mexican-American women described (MA 3.03, AA 1.78) reported significantly higher use of multiple substances than AA women. Substance use including inhalants, cocaine, marijuana, heroin, methamphetamine, and benzodiazepine was significantly higher among MA than AA women. Tobacco and alcohol use was also significantly higher among MA in contrast to AA women.

STI/HIV knowledge

Both MA and AA women responded correctly to specific true/false questions regarding STI/HIV transmission (Table 3). This knowledge included increased risk of AIDS transmission through “*needle sharing*,” “*more partners*,” “*oral sex*,” and “*anal sex*.” Both MA and AA women reported correctly that STI/HIV transmission risk is not reduced by “*pulling out before ejaculation*,” “*washing after sex*,” “*taking antibiotics*,” or “*douching*.” The majority of both groups of women responded correctly that “*STI transmission is possible during menses*.” Approximately half of all women, however more AA than MA women, reported that “*HIV is not transmitted by sharing a glass of water or sitting in a hot tub or pool with a person who has HIV*.” The majority of MA and AA women correctly reported that “*failure to treat STIs can result in infertility*,” and that “*some STIs do not cause symptoms*” or “*symptom resolution does not indicate that STI treatment is unnecessary*.” Approximately half of MA and AA correctly reported that, “*having STIs makes individuals more susceptible for HIV transmission*.”

Mexican-American and AA women (Table 3) responded correctly that “*it is not possible to tell if an individual is infected with HIV one week after sex with an HIV infected person*.” They also responded correctly that “*not all people with HIV infection look sick*,” “*washing genitalia after sex will not prevent HIV*” or that “*you cannot always tell if someone has an STI*.” A majority of MA and AA women responded that “*not all STIs can be cured*,” or “*condoms do need to cover the whole penis to be effective for prevention of STI/HIV*.”

Women responded incorrectly to other STI/HIV questions regarding condom type and STI/HIV transmission (Table 3). Approximately half of MA and AA women responded incorrectly that “*natural skin condoms work better than latex*”, or “*it is not easier for woman to get an STI from a man than the man to get one from a woman*,” or that “*HIV transmission occurs through coughing and deep kissing*.” Most women responded incorrectly that “*all babies born to mothers with HIV will have AIDS*.”

Descriptions by ethnicity found that overall STI/HIV knowledge scores (Table 3) were significantly higher for AA (22.33) than MA (20.70) women. Mexican-American women responded incorrectly more often than AA women to STI/HIV knowledge questions including “*transmission of HIV through coughing*,” “*prevention of HIV through withdrawal*” and “*douching*.” Significantly more MA than AA women responded incorrectly that “*STIs do not cause cervical cancer*,” “*HIV infected mothers always transmit HIV to their babies*” and “*people with HIV are easily identified because they look sick*.”

Discussion

Theoretical and empirical support from decades of descriptive research associates STI/HIV prevention, acquisition and resolution with multiple psychosocial and situational factors (Champion, 2007; Champion, et al., 2005; Koniak-Griffin et al., 2003; Roye, Perlmutter, Silverman, & Krauss, 2007). Results from this study are consistent with prior research describing a high incidence of sexual risk and STI sequelae for ethnic minority adolescent women.

As in previous adaptations of the AIDS Risk Reduction Model for use among African- and Mexican-American adolescents (Champion & Collins, 2010), explanatory factors and modifiers describe the complex interaction of demographic, psychosocial and situational factors associated with sexual partner relationships, sexual risk behavior and associated factors including substance use, pregnancy, contraception or condom use, STI/HIV and abuse. Women in this study reported high incidences of previous STI and sexual, physical and emotional abuse with no differences by ethnicity. Mexican-American adolescent women did however experience potentially greater environmental risks than AA women including unemployment, runaway and nonattendance in school. Mexican-American adolescent women also experienced more sexual risk behaviors than AA adolescent women including substance use, alcohol, group sex or anal sex, and sex with injection drug users.

This evidence supports the conceptualization that sexual risk behaviors contribute to the vulnerability of ethnic minority adolescent women. It also supports conceptualizations that sexual risk behaviors are unique for African and Mexican American adolescent women. African American women have been found to abstain from alcohol and be less likely to drink heavily, possibly due to religious observances (Collins & McNair, 2003). Among Hispanic women those who are more acculturated drink more than less acculturated Hispanic women mirroring behaviors of women in the United States possibly as a result of modified socioeconomic status and beliefs about alcohol (Collins & McNair, 2003). Theoretically, MA women in this study represent a more acculturated population of Hispanic women as reflected in reports of high tobacco, drug and alcohol use.

Previous comparisons suggest that AA adolescents experience higher rates of ever having sex and first sex before 15 years of age as compared to non-Hispanic White adolescent women (Centers for Disease Control and Prevention, 2009). Mexican-American adolescent women were more likely to have an older sexual partner and more likely to report no contraceptive use at last sex than AA or non-Hispanic White adolescent women (Centers for Disease Control and Prevention, 2009).

Mexican-American women in this study reported less previous HIV testing with perceptions of low HIV risk as rationale for absence of testing. Despite previous overall higher self-reported use of birth control methods, more MA than AA women had been pregnant. Previous studies have identified these environmental and sexual risk behaviors among ethnic minority adolescents with a history of abuse or STI however, no differences by ethnicity among these MA and AA women have been described (Champion, 2011). These findings in conjunction with overall lower STI/HIV knowledge identify MA adolescent women with a history of STI or abuse as an extremely vulnerable group at risk for STI, substance use, pregnancy, abuse and HIV.

Knowledge acquisition is an important precursor to movement within stages of the AIDS Risk Reduction Model with respect to the interrelated factors associated with STI/HIV sequelae. Knowledge of STI/HIV risk is the cornerstone for recognition of risk with subsequent commitment to seeking and enacting solutions to reduce risk. Theoretically, knowledge of STI risk enables adolescent women to pass from one stage in the AIDS Risk Reduction Model to another to attain change at each stage.

Descriptions by ethnicity revealed in this study that overall STI/HIV knowledge was greater for AA than MA women. Incorrect STI/HIV knowledge was reported more frequently by MA women with regard to the prevention and transmission of STI/HIV. These knowledge deficits are problematic, particularly with regard to behaviors (withdrawal and douching) known to increase STI potential. These findings are not consistent with those of Ito and Brown (2010) who found AA and MA adolescent women STI knowledge was high.

This study extends prior work in this area through description of sexual risk behaviors among AA and MA ethnic groups (Morrison-Beedy Nelson, Volpe, & Melnyk, 2005). Adolescent women in this study experienced disproportionately high sexual risk behavior. However, significantly higher incidence of sexual risk behavior among MA than AA adolescent women was identified. More extensive STI/HIV knowledge was described among AA than MA adolescent women. Recognition of the unique characteristics of each ethnic group compels modification of STI/HIV interventions within community health care settings. Sustained efforts to address STI/HIV risk among ethnic minority adolescent women require appreciation of unique approaches for efficacious intervention among those with histories of abuse and STI. Little evidence, however, provides guidance for health care delivery related to ethnic minority adolescent women with histories of STI or abuse with respect to sexual risk and STI/HIV knowledge. This study addresses this gap with results that identify differences between these adolescent women with respect to STI/HIV knowledge and sexual risk behavior.

Limitations

The questionnaire utilized self-report for assessment of demographic characteristics, sexual risk behaviors and STI/HIV knowledge. Self-report is limited by participant recall and social desirability associated with the questionnaire content. The potential for women to respond in socially desirable ways is possible yet unlikely. The instrumentation used for data collection purposely addresses the same question multiple times in multiple formats throughout the structured interview. Proportionately more MA than AA participants were included in the study. This ethnic composition however reflects the predominately MA population accessing public health clinic services at the metropolitan study site. The study findings are limited to the AA women and MA women with a history of STI or physical, sexual or emotional abuse accessing sexual health care at metropolitan public health clinics and may not be representative of other AA women or MA women without these histories or sexual health care needs.

Implications

Sexual health care providers who counsel MA and AA adolescent women are encouraged to thoroughly assess personal history including abuse, sexual risk behavior and knowledge of STI/HIV transmission (Centers for Disease Control and Prevention, 2006, 2010). This information is critical for tailoring of efficacious STI/HIV health education among MA and AA adolescent women, particularly those with histories of STI and abuse.

Conclusions

Descriptions of sexual risk behavior and STI/HIV knowledge among ethnic minority adolescent women with histories of STI or sexual, physical or emotional abuse portrayed MA women with higher levels of STI, pregnancy, substance use and abuse and lower levels of STI/HIV knowledge, previous HIV testing and perceptions of risk than AA. Tailoring of STI/HIV community-based health promotion interventions for MA and AA adolescent women with histories of STI and abuse is indicated for amelioration of potential adverse sexual health outcomes among these women.

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Table 1

Description of Demographic Characteristics by Ethnicity

Variable	African American N=94 %	Mexican-American N=465 %	P
Sociodemographic Characteristics			
Sexual preference			.018*
Heterosexual	93.6	87.3	
Bisexual	4.3	12.3	
Homosexual/gay	2	0.4	
Mean age, years + s.d.	16.45 (1.43)*	16.54 (1.29)*	.522
Ever arrested, convicted, incarcerated, on probation	44.7	47.7	.65
Ever Run Away	36.2	52.0	.006*
Enrolled in School	77.7	62	.004*
Employed	32.6	17.8	.003*
Sexual/Reproductive Health History			
Ever pregnant	39.4	46.2	.127
Ever use birth control	93.5	98.3	.018*
Previous HIV Testing	77.7	63	.006*
No HIV testing because she doesn't think she is at risk	30.0	43.2	.188
History of STI	29.8	27.5	.371
Abuse			
Any Abuse (Physical, Sexual, Psychological)	87.2	87.1	.971
Physical Abuse	45.7	48.7	.651
Sexual Abuse	50.0	52.0	.735
Psychological Abuse	69.1	68.3	.904
Forced Sex	23.4	25.6	.698
Ever raped	20.2	18.3	.664
Molested	21.3	26.0	.365
First Sex Forced	9.6	9.9	.551
Sex without control	9.6	12.5	.276
Anyone make her feel afraid to say no to sex	13.8	11.8	.604
Physically hurt during sex	10.6	6.9	.148
Anyone forced sex without protection when she wanted protection	17.0	13.5	.232
Violence comp score	6.31**	6.99**	.345

* P < .05

** Mean and Standard Deviation, Student t - test as appropriate

Table 2

Description of Sexual Risk Behavior by Ethnicity

Sexual Risk Behavior	African-American N=94 (%)	Mexican-American N=465 (%)	P
Sex without a condom	95.7	98.7	.070
Anal Sex	10.6	24.1	.002*
Give Oral Sex	51.1	65.2	.014*
Group Sex	2.1	8.6	.030*
Received oral sex	77.7	78.3	.892
Sex with Bisexual Man	3.2	2.6	.726
Sex with Women	7.4	15.7	.036*
Sex with Friends with Benefits	36.2	31.2	.396
Sex for Money	2.1	1.5	.652
Sex to Pay Back Favors	4.3	2.6	.325
Sex with Injection Drug User	3.2	11.8	.009*
Age at First Sex (years)	14.22	13.92	.146
Age of Man at First Sex (years)	16.99	16.87	.765
Sex with HIV partner	1.1	0.2	.308
Smoke cigarettes	52.1	74.4	.000*
Drink Alcohol	60.6	78.9	.000*
Cocaine	10.6	42.4	.001*
Marijuana	62.8	83.9	.001*
Heroin	1.1	13.8	.001*
Methamphetamine	2.1	14.6	.001*
Ecstasy	13.8	13.3	.869
Benzodiazepenes	24.5	42.4	.001*
Inhalants	0	5.8	.014*
Drug use comp score	1.17 (1.258)**	2.25 (1.760)**	.001*
Substance comp score with ETOH	1.7766 (1.54610)**	3.0344 (1.90589)**	.001*

* P < .05

** Mean and Standard Deviation, Student t - test as appropriate

Table 3

Description of STI/HIV Knowledge and Beliefs by Ethnicity

Variable	African American N=94 % Correct Response	Mexican American N=465 % Correct Response	P
Knowledge			
HIV can be transmitted through drinking from water fountains	73.4	72.0	.900
AIDS can be transmitted through needle sharing	96.8	98.1	.435
Coughing/sneezing do not spread HIV	44.7	34.6	.043*
Female condom exists to prevent HIV transmission	51.1	46.9	.498
More partners increases chance of STI	90.4	89.7	.501
STI/HIV transmission is possible through oral sex	87.2	84.1	.531
STI can cause cervical cancer	82.6	69.8	.018*
STI can make women infertile	80.2	73.7	.223
If symptoms go away you don't need treatment	89.5	86.7	.596
Infection with STI increases chance for HIV infection	52.1	60.0	.097
STI/HIV transmission is possible through anal sex	86.2	85.2	.874
HIV transmission is possible through sharing a glass of water with someone HIV +	73.4	72.0	.900
You can get AIDS from sharing needles	96.8	98.1	.435
Man pulling out before orgasm prevents HIV	85.1	76.6	.042*
Washing genitalia after sex prevents STI/HIV	78.7	76.3	.689
All pregnant women who are HIV positive will have babies born with AIDS	33.0	19.6	.006*
All people with HIV look sick	79.8	67.3	.019*
HIV vaccine exists to prevent HIV infection	55.3	51.6	.572
Can get HIV through deep kissing with an HIV positive partner	50.0	43.2	.255
Cannot get STI/HIV if she has sex during her period	85.1	78.7	.204
Natural skin condom prevents HIV better than latex condoms	45.7	38.9	.249
Protection from HIV transmission if taking antibiotics	66.0	60.0	.299
You can tell you have HIV one week after having sex with someone who has HIV	64.9	57.8	.250
You can get HIV from swimming pools and hot tubs	68.1	58.7	.056
Using Vaseline or baby oil with condoms prevents HIV transmission	70.2	61.5	.069
Douching protects women from getting STI/HIV	81.9	64.7	.001*
All STI can be cured	76.7	74.2	.685
Condoms don't have to cover the whole penis as long as they cover the tip and sores	82.6	75.3	.094
Oil based lubricants make condoms work better	54.7	45.3	.072
Person can have STI without having symptoms	89.5	86.7	.596
Can always tell if someone has an STI	95.3	89.5	.062

Variable	African American N=94 % Correct Response	Mexican American N=465 % Correct Response	P
Easier for woman to get STI/HIV from man than man to get from woman	47.7	44.4	.635
Knowledge score	22.33 (5.187) **	20.27 (5.503) **	.001 (0.791–3.321) *

* P < .05

** Mean and Standard Deviation, Student t - test as appropriate

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