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Cross-sectional data on alcohol and marijuana use and sexual behavior among male and female secondary school students in New Providence, The Bahamas

Linda Kaljee, Ph.D^a, Bo Wang, Ph.D^b, Lynette Deveau, MPH^c, Sonja Lunn, M.D^d, Glenda Rolle, M.Ed^e, Maria Elena Villar, Ph.D^f, and Bonita Stanton, M.D.^g

^aPediatric Prevention Research Center, Carmen and Ann Adams Department of Pediatrics, Wayne State University School of Medicine, Detroit, Michigan, USA, 48201

^bPediatric Prevention Research Center, Carmen and Ann Adams Department of Pediatrics, Wayne State University School of Medicine, Detroit, Michigan, USA, 48201

^cOffice of HIV and AIDS Research, Ministry of Health, Nassau, The Bahamas

^dOffice of HIV and AIDS Research, Ministry of Health, Nassau, The Bahamas

^eHealth and Family Life Education, Ministry of Education, Nassau, The Bahamas

^fSchool of Journalism and Mass Communication, Florida International University, North Miami, Florida, USA 33181

^gSchool of Medicine, Office of the Dean, Wayne State University, Detroit, Michigan, USA, 48201

Abstract

Background—While The Bahamas have significantly reduced poor reproductive health outcomes among adolescents and emerging adults, data indicate that youth are engaged in sexual risk behaviors. Substance use has been linked to increased risk for HIV and STIs in other contexts. There is limited data on Bahamian youth in relation to consumption of alcohol and use marijuana and engagement in sexual behaviors.

Objective—To assess potential relationships between alcohol and marijuana use and engagement in sexual behavior among government secondary school students in New Providence, The Bahamas.

Subjects—Total sample size was 2,572. Fifty-six percent of respondents were female. Mean age was 14.2 (SD 2.7 years).

Methods—Cross-sectional data are from a baseline survey conducted as part of a longitudinal randomized controlled evaluation of a school-based HIV prevention and reproductive health program in New Providence.

Corresponding author: Linda Kaljee, Ph.D., Associate Professor, Pediatric Prevention Research Center, Carmen and Ann Adams Department of Pediatrics, 4707 St. Antoine Street, Suite 504 West, Old Hutzel Bldg., Detroit, MI 48201. Mobile: 1 301 873 1203; lkaljee@med.wayne.edu. (bwang@med.wayne.edu). (lyndeveaux@yahoo.com). (slunn@coralwave.com). (grolle54@gmail.com). (mevillar@fiu.edu). (bstanton@med.wayne.edu).

Results—Overall, 46.5% (519) males and 44.8% (652) females reported alcohol consumption; 7.3% (82) males and 1.7% (25) females reported use of marijuana in the last six months. Forty-three percent (477) male respondents and 16% (231) female respondents reported ever having vaginal sex. Logistic regression analysis indicates increased likelihood of engaging in sex during the past six months is associated with being older, male, and consuming alcohol and marijuana.

Conclusion—These data provide a ‘global correlation’ between substance use and engagement in sexual behaviors among Bahamian adolescents. Longitudinal research is needed to assess event specific risks and identify mediating and moderating factors. These findings indicate the importance of integrating reproductive health and substance use education.

Keywords

Adolescents; substance use; sexual risk; Caribbean

Introduction

The Bahamas have made significant inroads toward decreasing the prevalence of adverse sexual health outcomes through primary and secondary prevention interventions (Dinkelman, 2011; Gomez et al., 2002). In 1986, the rate of adolescent pregnancy (10-19 years) was 16.5%; in 2011, the rate was 10.5%. Between 2001 and 2010, the annual number of new HIV infections declined by 39% (Bahamian Ministry of Health, 2014). However, HIV prevalence remains at 2.5% among the general population and AIDS is the leading cause of death for individuals’ age 15 to 45 years (UNAIDS/Bahamian Ministry of Health, 2012). In addition, annually there is an average of 2000 cases of gonorrhoea throughout the Caribbean with approximately 11% of those cases in The Bahamas (PAHO/WHO, 2012a). While rates of teenage pregnancy have decreased, there are more than 500 births per year to girls/women age 10 to 19 years (Department of Statistics of The Bahamas, 2012). In our own research with a cohort Bahamian students ages 9 to 12 years at baseline, approximately 4% (/1360) reported having engaged in sex (Gong et al., 2009).

In 2005, the average alcohol consumption for Bahamian adults (15+ years) was 8.76 litres/year which was slightly lower than in the United States (9.44 litres/year) and higher than for the Region of the Americas [7.33 litres/year] (PAHO/WHO, 2012b). Consistent with most countries in the region, the legal age for consuming alcohol is 18 years. Globally, alcohol and marijuana consumption has been directly and indirectly associated with engagement in sexual behaviors including higher risk behaviors (e.g., multiple partners, inconsistent condom use) among adolescents and young adults. Coleman (2005) in a review of the literature discusses ‘global correlation studies’, which associate general alcohol consumption and sexual behaviors and ‘event-specific’ studies, which ask about consumption patterns in relation to a specific sexual episode. Some research suggests that the relationship between alcohol and sexual behaviors is more likely part of a pattern of risk-taking behaviors than a direct causal mechanism. Thus, research on adolescents living in the United States and other high income countries has focused on possible mediating factors (e.g., expectancies, sensation-seeking) that might affect decisions to engage in sexual behaviors after drinking alcohol or marijuana consumption (Dermen et al, 1998; Guilette and Lyons, 2006; Thompson et al., 2005).

However, there remains strong evidence for establishing links between alcohol and marijuana use, sexual risk behaviors and HIV infection. In a recent meta-analysis of 10 studies, general alcohol use, alcohol use prior to engagement in sexual relations, and binge drinking were all strongly associated with increased risk of HIV infection (Baliunas et al., 2010). A study conducted in a U.S. urban emergency department indicates a link between marijuana use HIV risk behaviors and dating violence (Boner et al., 2014). In a review of 20 alcohol and HIV studies in sub-Saharan Africa, problem drinking was associated with HIV status for both men and women, as well as with sexual violence resulting in the authors' recommendation for multi-level interventions linking alcohol use with unsafe sex and HIV risk (Chersich et al., 2009). A literature review of 17 English and Chinese publications reveals consistent links between alcohol use and engagement in sexual risk behaviors, sexual coercion, sexual violence and HIV and other sexually transmitted diseases (Li et al., 2010). In a survey among Thai vocational students, alcohol consumption was part of the predictive model for inconsistent or non-condom use (Thato et al., 2003). In Viet Nam among cohorts of 15 to 20 year olds and 18 to 24 year olds, alcohol use is associated with increased likelihood of engagement in sexual behaviors (vaginal, anal, and/or oral sex) and for young men likelihood of multiple partners (Kaljee et al., 2004; Kaljee et al., 2009).

To date, there is limited data on substance use and sexual behaviors in the Caribbean. Unpublished data from a survey conducted in 2012 among 8th, 10th, and 12th grade students in 44 schools on 7 Bahamian islands indicates 70% respondents had 'ever' consumed alcohol and 30% had consumed alcohol in the last 30 days. Males (68.9%) and females (71.1%) were similarly likely to report 'ever' consuming alcohol. Average age for first consumption of alcohol was 11.6 years. In the same study, over 13% of students had ever consumed marijuana and 5% had used in the last 30 days. Unlike alcohol, reported lifetime marijuana use was higher for males (18.7%) than females (8.7%) (Bahamas Ministry of National Security, 2012). Our research in The Bahamas indicate among a cohort of 6th grade students, 26.5% (96/363) boys and 21.8% (92/422) girls report ever consuming alcohol. In this cohort, male respondents' tendency to report 'problem behaviors' (including alcohol consumption) was associated with greater self-enhancement [personal interests above others' welfare] (Liu et al, 2007). A qualitative study among tourism workers in the Dominican Republic suggests that alcohol use is perceived to decrease sexual control and possibly affect condom use (Padilla, et al 2012). In Trinidad and Tobago, research indicates that ineffectiveness of HIV prevention interventions may be at least partially attributable to a lack of attention within these programs to alcohol and other substance use (Reid et al., 2012). In a review of research on alcohol related injuries in emergency departments in the Caribbean and Latin American, the authors conclude that across the region data collection on alcohol consumption is inconsistent and limited interventions and policies exist (Andreuccetti et al., 2012).

The current paper presents data from the baseline survey of a longitudinal randomized controlled evaluation of a combined school-based HIV prevention and reproductive health program (Caribbean Focus on Youth-CFOY) and parent intervention (Caribbean-IMPACT) in New Providence, The Bahamas (Knowles et al., 2012; Stanton et al., 2012). The overall objective for the current paper is to report data on sexual behaviors and alcohol and marijuana use among evaluation participants. Specific aims are: 1) in terms of 'global

correlation', is engagement in vaginal sex associated with alcohol and marijuana use; 2) are alcohol and marijuana use associated with riskier sexual behaviors (inconsistent condom use, multiple partners); 3) how do these associations differ by gender; and, 4) what are the implications of these data for future research and program development.

Materials and Methods

Research ethics

Written parental consent and student assent were obtained from all participants in the program evaluation prior to collection of baseline data. The study protocol was approved by the ethical review committees at Wayne State University, School of Medicine, Detroit Michigan and the Princess Margaret Hospital, Ministry of Health, Nassau, The Bahamas. All authors and research staff have completed U.S. National Institute of Health approved ethical training courses.

Research site and participants

New Providence is the second largest island in the Bahamian archipelago and includes the seat of national government in the town of Nassau. Baseline data for the longitudinal evaluation were collected from 10th grade students in the eight government high schools on the island. All students received the CFOY and were randomized for one of three parent conditions: the Caribbean ImPACT program; an "attention control" program on career planning; no parent intervention. Only assenting students with parental consent participated in the evaluation. Approximately 60% of all 10th grade students in government high schools in Nassau were evaluated at baseline.

Evaluation instrument and outcome measures

The FOYC program was evaluated using the Bahamian Youth Health Risk Behavior Instrument (BYHRBI). The BYHRBI was an adaptation of the YHRBI developed in conjunction with the Focus on Youth program in the United States (Stanton et al., 1995). For the current analysis, outcome measures include demographics (gender and age), self-evaluation of academic performance, perceptions of alcohol and marijuana use among relatives, neighbors, and friends, and reported sexual and substance use behaviors (see Table 1).

Data collection

Baseline data were collected in two waves in September 2008 and 2009 immediately prior to the implementation of the intervention. Data were collected in the Family Life Education classes during school hours. Trained data collectors read through the evaluation instrument while students marked their responses on a copy of the instrument. This method increased confidentiality but accounted for issues of varying degrees of literacy within the classrooms.

Data analysis

Descriptive statistics (mean and standard deviation, proportion) were calculated for demographic, alcohol use and marijuana use variables; gender differences in these variables

were examined using a chi-square test (for categorical variables) or Student's t test (for continuous variables). Association between sexual risk behaviors and alcohol use and marijuana use were examined Pearson's chi-square test (for nominal scaled variables) and Cochran-Mantel-Haenszel statistics (ordinal scaled variables). The test statistics were adjusted for the clustering effects of classroom and/or school using variance inflation factors (VIFs). Multilevel logistic regression analysis was conducted using the generalized linear mixed model (GLIMMIX) procedure to identify risk factors for sexual intercourse in the last six months (active sexual behavior). Independent variables included age, sex, student academic self-evaluation, drinking alcohol, using marijuana, relative(s), neighbor(s), or friend(s) drinking alcohol or using marijuana. Odds Ratios were calculated for each predictor variable. The intra-class correlation coefficient was calculated for the outcome variable. All statistical analyses were performed using the SAS 9.2 statistical software package (SAS Institute Inc., Cary, NC, USA).

Results

Total sample size was 2,572 including 1,455 females (56.6%). Mean age of respondents was 14.2 (SD 2.7) years with no significant difference in age of male and female respondents.

Alcohol and marijuana use and perceptions of others' consumption

A total of 46.5% (519) and 44.8% (652) of males and females respectively reported consumption of alcohol during the past six months ($X^2=0.63$, $p=0.404$). However, significantly more male respondents (7.3%, 82) reported use of marijuana in the last six months compared to female respondents (1.7%, 25) [$X^2=37.67$, $p<.001$]. A majority of respondents reported seeing relatives or neighbors drink alcohol 'very often' or 'sometimes'. Thirty four percent of respondents reported seeing relatives use marijuana and approximately 50% reported seeing neighbors use marijuana. Male respondents were more likely to report seeing relatives use marijuana. Over 73% of both female and male respondents report 'most' or 'some' of their friends drink alcohol; however, male respondents are more likely to report friends' use of marijuana (See Table 2).

Engagement in sexual behaviors

Overall, 43% (477) of male respondents and 16% (231) of female respondents reported ever having vaginal sex. Approximately 23% of males and 7.3% females reported having sex in the past six months. Among male respondents, 78% (341) stated that age at first sexual intercourse was between 10 and 13 years; 63% (130) of female respondents reported age of sexual initiation between 14 and 17 years. Among sexually active youth 64% (159) of males and, 28% (29) of females reported two or more partners in the past six months. Twenty-three percent (98) of males and 47% (95) of females reported having a sexual partner three or more years older than the respondent. Reported condom use at last sexual episode was 78% and 88% respectively for males and females. Thirty-four percent (150) of males and 24% (46) of females reported inconsistent condom use ("never" or "sometimes").

Substance use and sexual behaviors

Both males and females reporting consumption of alcohol were more likely to ‘ever had vaginal sex’ and to have had sex in the past six months. Age of partner and number of partners were not significantly related to alcohol consumption. Female respondents reporting consumption of alcohol compared to non-users were more likely to report consistent condom use. There was no difference by alcohol consumption among male respondents’ for reported frequency of condom use (Table 3). Logistic regression analysis further indicates that increased likelihood of engaging in sex during the past six months is associated with being older, male, and consuming alcohol and marijuana. Among male respondents, seeing relatives and/or neighbors use marijuana and perceived friends’ use of marijuana is associated with increased likelihood of sex during the past six months. Overall and among females, there is an association between class assignment within schools and engagement in sex in the last six months. There is no relationship at the school level (Table 4).

Discussion

To date, there is relatively little published data available regarding alcohol use among youth in the Caribbean, with even less research on the possible relationship between substance use and sexual risk behaviors in this population. Our cross-sectional data indicate significant use of alcohol among 10th grade students in The Bahamas with nearly half of both male and females reporting consumption of alcohol in the past six months. These consumption data are consistent with unpublished survey data on alcohol use among 8th, 10th, and 12th grade students in The Bahamas (Bahamas Ministry of National Security, 2012). These data further suggest that for male and female respondents both alcohol and marijuana use are associated with engagement in vaginal sex in the past six months. This is consistent with previous findings that indicate risk behaviors among Caribbean adolescents were associated with early sexual initiation (Ohene, 2005).

Among male respondents, exposure and perceptions of others’ (relatives, neighbors, friends) use of marijuana is associated with increased likelihood of having engaged in vaginal sex in the past six months. This finding could indicate that social environmental factors broadly affect engagement in a range of higher risk behaviors. Recent engagement in sex was also associated with class assignment within schools. This could be interpreted multiple ways including engagement in sexual relationships between classmates, peer influences (particularly for female students) and/or effects of peer within classroom interactions on descriptive norms. This finding is in line with the clustering of risk behaviors among adolescents and would support the use of normative prevention approaches (Botvin, 2000). Recent research indicates adolescents and young adults often hold normative misperceptions related to sexual activity and alcohol-related sexual activity of their peers (Gibbons et al., 1995; Lewis et al., 2007; Martens et al., 2006; Scholly et al., 2005) found misperceptions of descriptive risky sex and alcohol-related risky sex norms were associated with actual risky sexual behavior, alcohol-related risky sexual behavior, and drinking behavior. These perceptions can be targeted with education interventions to overcome the misperceptions often held by adolescents that the majority of their peers and adults use alcohol and other drugs (Martens et al., 2006).

Alternatively, students are not randomly assigned to classrooms but rather by academic performance. The data do not indicate a relationship between level of self-evaluation of academic performance and engagement in sex in the past six months. However the clustering of greater/lesser likelihood of engaging in sex by classroom assignment may suggest some link with academic placement and performance. Future research could explore this relationship between academics and risk behavior and explore the possibility of academic interventions as risk reduction strategies.

Among female respondents, alcohol consumption is associated with more consistent condom use. This is counter-intuitive but may indicate that females engaged in other risk behaviors such as alcohol consumption may perceive themselves as more vulnerable to adverse sexual health outcomes. Recent research among U.S. adolescents may help explain the variance in condom use. Predictors of condom use (and non –use) include body image, age difference between partners, use of hormonal contraceptives, among others. Also, nearly 50% of sexually active female respondents report having a sex partner three or more years older-a factor which has also been shown to increase risk of exposure to STIs and HIV among adolescent women (Beauclair et al., 2012; Volpe et al., 2013). In research conducted in Jamaica among adolescent girls, over 58% were in age-disparate relationships at the time of the survey with 40% reporting their partners had multiple sexual partners (Wood et al., 2011). Qualitative data from Jamaica also indicates that age-disparate relationships among adolescent girls are associated with multiple partners and transactional sexual relations (Wood, 2010).

Future longitudinal data analysis and research is needed to determine possible moderating/mediating factors [e.g., descriptive norms, sensation seeking, alcohol expectancies, and coping strategies] (Dermen, et al., 1998; Kaljee et al., 2012) which could affect the relationship between alcohol use and sexual behaviors in this population. Such data could enable development of integrated sexual risk and substance use interventions which account for the multiple psychosocial variables affecting co-occurrence of substance use and sexual risk behaviors among adolescents in The Bahamas and elsewhere in the region. Future research in the Caribbean needs to include scales and items designed to measure drinking patterns, levels of consumption, and episodic specific links between alcohol use, other substance use, and sexual behaviors, as well as qualitative research to better understand gender differences in marijuana exposure, alcohol use and decision making regarding condom use. FOYC includes a module on alcohol use and sexual risk. At this time, the Ministry of Education is implementing FOYC throughout the Bahamian public school system as a part of their Family Life Education program (Knowles, et al., 2012). These and other data will help to determine needs for additional alcohol and other substance use educational programs for adolescents.

The analysis is limited in terms of being collected only on one island (New Providence) and therefore may not be reflective of The Bahamas in general. Analysis was also limited in terms of types of data collected on alcohol and marijuana consumption. Future research in the Caribbean needs to include scales and items designed to measure consumption patterns, levels of consumption, and episodic specific links between alcohol use, other substance use,

and sexual behaviors, as well as qualitative research to better understand the gender differences in marijuana exposure, alcohol use and decision making regarding condom use.

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References

- Andreuccetti G, Carvatho HB, Korcha R, Ye Y, Bond J, Cherpitel CJ. A review of emergency room studies on alcohol and injuries conducted in Latin America and Caribbean region. *Drug Alcohol Rev.* 2012; 31(6):737–746. [PubMed: 22340601]
- Bahamas Ministry of National Security. National Anti-drug Secretariat. Bahamas Secondary School Drug Prevalence Survey. 2012 unpublished data.
- Baliunas D, Rehm J, Irving H, Shuper P. Alcohol consumption and risk of incident human immunodeficiency virus infection: a meta-analysis. *Int J Public Health.* 2010; 55(3):159–66. [PubMed: 19949966]
- Beauclair R, Kassanjee R, Temmerman M, Welte A, Delva W. Age-disparate relationships and implications for STI transmission among young adults in Cape Town, South Africa. *Eur J Contracep Reprod Health Care.* 2012; 17(1):30–39.
- Boner EE, Whiteside LK, Walton MA, Zimmerman MA, Booth BM, Blow FC, Cunningham R. Prevalence and correlates of HIV risk among adolescents and young adults reporting drug use: Data from an urban Emergency Department in the U.S. *J HIV AIDS Soc Serv.* 2014; 28(2):625–630. [PubMed: 25126024]
- Botvin GJ. Preventing drug abuse in schools: Social and competence enhancement approaches targeting individual-level etiologic factors. *Addict Behav.* 2000; 25(6):887–897. [PubMed: 11125777]
- Chersich MF, Rees HV, Scorgie F, Martin G. Enhancing global control of alcohol to reduce unsafe sex and HIV in sub-Saharan Africa. *Global Health.* 2009; 5:16. [PubMed: 19919703]
- Coleman, LM. Report prepared for the Health Development Agency and the Teenage Pregnancy Unit. Trust for the Study of Adolescence; Brighton: 2005. Young people, ‘risk’, and sexual behavior: a literature review.
- Department of Statistics of the Bahamas. Birth Report: 1970-2010. Reports of Surveys. Available at: www.statistics.bahamas.gov.bs/reports.php.
- Dermen KH, Cooper ML, Agocha VB. Sex-related alcohol expectancies as moderators of the relationship between alcohol use and risky sex in adolescents. *J Stud Alcohol.* 1998; 59(1):71–77. [PubMed: 9498318]
- Dinkelman J. Working towards an AIDS-free generation. The Nassau Guardian. Dec 2, 2011 Available at: http://www.thenassauguardian.com/index.php?option=com_content&view=article&id=17952:working-towards-an-aids-free-generation&catid=49:op-ed&Itemid=86.
- Ministry of Health, The Bahamas. Vital Statistics. The Bahamas; Nassau: 2014.
- Gibbons FX, Helweg-Larson M, Gerrard M. Prevalence estimates and adolescent risk behavior: Cross-sectional differences in social influences. *J Appl Psychol.* 1995; 80:107–121. [PubMed: 7706189]
- Gomez MP, Kimball AM, Orlander H, Bain RM, Fisher LD, Holmes KK. Epidemic crack cocaine use linked with epidemics of genital ulcer disease and heterosexual HIV infection in the Bahamas: evidence of impact of prevention and control measures. *Sex Transm Dis.* 2002; 29(5):259–64. [PubMed: 11984441]
- Gong J, Stanton B, Lunn S, Deveaux L, Li X, Marshal S, Brathwaite N, Cottrell L, Harris C, Chen X. Effects through 24 months of an HIV/AIDS prevention intervention based on Protection Motivation Theory among preadolescents in The Bahamas. *Pediatrics.* 2009; 123(5):917–928. [PubMed: 19255021]

- Guilette DL, Lyons MA. Sensation seeking, self-esteem, and unprotected sex in college students. *J Assoc Nurses AIDS Care*. 2006; 7(5):23–31.
- Kaljee L, Genberg B, Minh TT, Tho LH, Thoa LTK, Stanton B. Alcohol use and risk behaviors among rural adolescents in Khanh Hoa Province Viet Nam. *Health Educ Res*. 2004; 20(1):71–30. [PubMed: 15198997]
- Kaljee L, Green M, Zhan M, Riel, R, Lerdboon P, Lostutter T, Tho LH, Luong L, Minh TT. Gender, alcohol consumption patterns and engagement in sexually intimate behaviors among adolescents and young adults in Nha Trang, Viet Nam. *Youth Soc*. 2009; 43(1):118–141. [PubMed: 21373363]
- Kaljee, L.; Lostutter, T.; Tho, LH.; Minh, TT. Alcohol consumption, coping, and sexual behaviors among university men in Viet Nam: Implications for interventions. Research Society for Alcoholism; San Francisco, CA: Jun. 2012
- Knowles V, Kaljee L, Deveaux L, Lunn S, Rolle G, Stanton B. National implementation of an evidence-based HIV prevention and reproductive health program for Bahamian youth. *Int Electron J Health Educ*. 2012; 15(1):173–190. [PubMed: 25197265]
- Lewis MA, Lee CM, Patrick ME, Fossos N. Gender-specific normative misperceptions of risky sexual behavior and alcohol-related risky sexual behavior. *Sex Roles*. 2007; 57:81–90.
- Li Q, Li X, Stanton B. Alcohol use and sexual risk behavior and outcomes in China: A literature review. *AIDS Behav*. 2010; 14(6):1227–1236. [PubMed: 19967440]
- Liu H, Yu S, Cottrell L, Lunn S, Deveaux L, Brathwaite NV, Marshall S, Li X, Stanton B. Personal values and involvement in problem behaviors among Bahamian early adolescents: a cross-cultural study. *BMC Public Health*. 2007; 7:135–144. [PubMed: 17605792]
- Martens MP, Page JC, Mowry ES, Damann, KM, Taylor KK, Cimini MD. Differences between actual and perceived student norms: An examination of alcohol use, drug use, and sexual behavior. *J Am Coll Health*. 2006; 54:295–300. [PubMed: 16539222]
- Ohene SA. The clustering of risk behaviors among Caribbean youth. *Matern Child Health J*. 2005; 9(1):91–100. [PubMed: 15880978]
- Padilla MB, Guilamo-Ramos V, Godbole R. A syndemic analysis of alcohol use and sexual risk behavior among tourism employees in Sosua, Dominican Republic. *Qual Health Res*. 2012; 22(1): 89–102. [PubMed: 21859907]
- PAHO/WHO. Caribbean Epidemiology Centre. Morbidity Review of Communicable Diseases in CAREC Member Countries: Syphilis. 2012a Available at: <http://new.paho.org/carec/dmdocuments/27.%20Syphilis.pdf>.
- PAHO/WHO. Health situation in the Americas: Basic Health Indicators. 2012b Available at: http://new.paho.org/hq/index.php?option=com_content&view=article&id=2470&Itemid=2003&lang=en.
- Reid SD, Malow RM, Rosenberg R. Alcohol, drugs, sexual behavior and HIV in Trinidad and Tobago—the way forward. *J Int Assoc Physicians AIDS Care*. 2012; 11(1):66–82.
- Scholly K, Katz A, Gascoigne J, Hoick P. Using social norms theory to explain perceptions and sexual health behaviors of undergraduate college students: An exploratory study. *J Am Coll Health*. 2005; 53:159–166. [PubMed: 15663064]
- Stanton B, Black M, Feigelman S, Ricardo I, Galbraith J, Li X, Kaljee L, Keane V, Nesbitt R. Development of a culturally, theoretically and developmentally based survey instrument for assessing risk behaviors among African American early adolescents living in urban low-income neighborhoods. *AIDS Educ Prev*. 1995; 7(2):160–177. [PubMed: 7619645]
- Stanton B, Chen X, Koci V, Deveaux L, Lunn S, Harris C, Brathwaite N, Gomez P, Li X, Marshall S. Effect of a grade 6 HIV risk reduction intervention four years later among students who were and were not enrolled in the study trial. *J Adolesc Health*. 2012; 50(3):243–249. [PubMed: 22325129]
- Thato S, Charron-Prochownik D, Dorn LD, Albrecht SA, Stone CA. Predictors of condom use among adolescent Thai vocational students. *J Nurs Scholarsh*. 2003; 35(2):157–163. [PubMed: 12854297]
- Thompson JC, Kao TC, Thomas RJ. The relationship between alcohol use and risk-taking sexual behaviors in a large behavioral study. *Prev Med*. 2005; 41(1):247–252. [PubMed: 15917018]
- UNAIDS/Ministry of Health, Bahamas/PEPFAR. The Commonwealth of the Bahamas: Global AIDS Response Progress Reporting, Monitoring the 2011 Political Declaration on HIV/AIDS, Country

Report 2012. Available at: [http://www.unaids.org/en/dataanalysis/monitoringcountryprogress/progressreports/2012countries/ce_BS_Narrative_Report\[1\].pdf](http://www.unaids.org/en/dataanalysis/monitoringcountryprogress/progressreports/2012countries/ce_BS_Narrative_Report[1].pdf).

Volpe EM, Hardie TL, Cerulli C, Sommers MS, Morrison-Beedy D. What's age got to do with it? Partner age difference, power, intimate partner violence, and sexual risk in urban adolescents. *J Interpers Violence*. 2013; 28(10):2068–2087. [PubMed: 23345572]

Wood EB. HIV related sexual risk behaviors among late-adolescent Jamaican girls with older male partners. *West Indian Med J*. 2010; 59(4):403–408. [PubMed: 21355516]

Wood EB, Hutchinson MK, Kague E, Hewitt H, Waldron N. Jamaican adolescent girls with older male sexual partners. *J Nurs Scholarsh*. 2011; 43(4):396–404. [PubMed: 22004468]

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Table 1

Outcome measures and responses items from the Bahamian Youth Health Risk

1	In the last six (6) months, have you had a drink of alcohol, beer, wine, rum, or bush rum or liquor (not including when you are taking communion)?
	a) Yes

b) I have never had sex

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Table 2

Perceptions of Relatives, Neighbors, and Friends Use of Alcohol and Marijuana

		Overall	Males	Females	adj. χ^2
	Sample size	2,572	1,117	1,455	
Seen relatives drink alcohol	Very often	32.6%	31.0%	33.9%	1.48
	Sometimes	51.6%	52.9%	50.6%	
	Never	15.8%	16.1%	15.5%	
Seen neighbors drink alcohol	Very often	56.9%	57.2%	56.7%	0.62
	Sometimes	29.4%	30.5%	28.6%	
	Never	13.6%	12.3%	14.7%	
Seen relatives use marijuana	Very often	15.0%	18.0%	12.8%	13.79 ^c
	Sometimes	19.0%	20.7%	17.7%	
	Never	66.0%	61.3%	69.5%	
Seen neighbors use marijuana	Very often	28.6%	35.7%	23.2%	30.10 ^c
	Sometimes	21.0%	20.2%	21.6%	
	Never	50.4%	44.1%	55.2%	
How many friends drink alcohol	Most	32.1%	31.1%	31.1%	0.46
	Some	41.4%	42.1%	42.1%	
	None	26.5%	26.8%	26.9%	
How many friends use marijuana	Most	9.9%	13.0%	7.5%	39.39 ^c
	Some	29.3%	34.7%	25.3%	
	None	60.8%	52.3%	67.2%	

Note: χ^2 statistics were adjusted using variance inflation factors;

a p<0.05;

b p<0.01;

^c p<0.001.

Table 3

Alcohol use and sexual behaviors among male and female secondary students in New Providence, The Bahamas

	Males				Females			
	Overall	Consume Alcohol	Not Consumed Alcohol	Adj. X^2	Overall	Consume Alcohol	Not Consumed Alcohol	Adj. X^2
Ever had sex	42.9%	58.9%	29.0%	69.28^c	15.9%	23.6%	9.7%	35.44^c
Sex last 6 months	22.9%	33.7%	13.5%	48.68^c	7.3%	11.3%	4.1%	20.93^c
Sex partner 3+ years older	23.1%	25.4%	18.6%	1.97	46.8%	45.7%	49.2%	0.17
2+ sex partners last 6 months	63.6%	64.5%	61.5%	0.01	27.9%	32.0%	18.7%	0.09
Condom use								
Never	12.9%	11.2%	16.2%	1.59	7.2%	4.6%	12.7%	6.09^b
Sometimes	21.7%	21.7%	21.6%		16.4%	13.6%	22.2%	
Always	65.4%	67.1%	62.2%		76.4%	81.8%	65.1%	

Note: X^2 statistics were adjusted using variance inflation factors.

^a $p < .05$;

^b $p < .01$;

^c $p < .001$

Table 4

Results of hierarchical logistic regression analysis of risk factors for sexual intercourse in the past six months by gender (Fixed effect)

Estimated models						
		Overall		Males		Females
<i>Fixed Effect</i>		OR (95% CI)	<i>T</i>	OR (95% CI)	<i>T</i>	<i>t</i>
Age		1.45 (1.23~1.73)	4.30^c	1.31 (1.05~1.62)	2.45^a	1.81 (1.36~2.39)
Gender	Male	Reference				
	Female	0.31 (0.23~0.41)	-8.83^c			
Academic self-evaluation	One of best	0.70 (0.21~2.35)	-0.60	0.64 (0.16~2.50)	-0.65	0.35 (0.05~2.31)
	Above middle	0.82 (0.25~2.76)	-0.33	0.65 (0.17~2.57)	-0.62	0.53 (0.08~3.57)
	Middle or below	Reference				
Drinking alcohol		2.64 (1.98~3.54)	7.15^c	2.56 (1.84~3.55)	5.62^a	2.76 (1.66~4.57)
Using Marijuana		5.85 (3.55~9.64)	7.58^a	6.29 (3.68~10.74)	6.73^a	4.98 (1.60~15.46)
Relative, neighbors, friends drink alcohol		1.28 (0.89~1.85)	1.34	1.17 (0.74~1.85)	0.65	1.60 (0.87~2.93)
Relative, neighbors, friends drink alcohol		1.51 (1.11~2.04)	2.63^b	1.78 (1.21~2.63)	2.90^b	1.33 (0.80~2.21)
<i>Random Effect</i>		β/SE	<i>χ</i> ²	β/SE	<i>χ</i> ²	β/SE
School		0.001/0.001	0.14	0/-	-	0/-
Class (nested within school)		0.002/0.001	5.93^b	0.003/0.003	1.51	0.005/0.002
Intra-class correlation		0.0019		0.020		0.067

^a p<.05;

^b p<.01;

^c p<.001