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Examining Relationships between Sexual Education and Behaviors Among Virginia College Students

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Walden University
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Abstract

The college student population has a high prevalence of sexually transmitted infections (STI)s due to their participation in higher risk sexual behaviors such as serial relationships, drug and alcohol use and abuse, and inconsistent use of condoms. The purpose of this study was to examine the relationship between student exposure of sexual education and their sexual behaviors among college going students in Virginia. Guided by the health belief model, this quantitative cross-sectional study involved a random selection process to recruit college students to test the hypothesis. The research questions were designed to examine participants' exposure to sexual education, sexual behaviors, perceptions of contracting STIs with no condom use, and their perceptions of STI education added to college curriculums. The sample included 656 participants who ranged between 18-24 years old and were enrolled in a Virginia 4-year public university. Data were collected through an online survey. A multivariate logistic regression analysis was used to analyze the variables sexual education (independent) and sexual behaviors (dependent). Prior research has indicated that STI prevention education programs implemented within a schools' curriculum has assisted in bridging the gap between public health and education. The study results have shown that the students who had some form of sexual education and were sexually active are less likely to participate in risky sexual practices. The study also indicated that 92.5% of the participants perceive that adding STI courses to the college curriculum will help prevent STIs among college students. These results highlight the sexual health of Virginia college students and promote positive social change among Virginia's college campuses by identifying the inconsistencies of STI knowledge and practices, which can encourage better education.

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Dedication

This research study is dedicated to my dad, Dr. Charles T. Williams M.D. (deceased), my number ones (my husband and our children). To all the Virginia college students and individuals who participated in the survey, you made this happen because without all of you this study would not have been completed. Last but not least, to all the youth and young adults who lack knowledge in the area of sexual education.

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Chapter 1: Introduction to the Study

Introduction

Over the past decade, sexually transmitted infection (STI) rates have continued to increase in the non-Hispanic, African America college student population, with 1.5 million new cases of chlamydia, 395,000 new cases of gonorrhea, and 24,000 new cases of syphilis reported in 2016 (Centers for Disease Control and Prevention [CDC], 2016a). Additionally, cases of STIs are more prevalent among adolescents and young adults 15-24 years old (CDC, 2016a). STIs are infections passed from one person to another through sexual contact (Office of Women's Health, 2016). STI infections can be either a form of bacteria, a virus, or parasite that enters the body and grows. STIs are spread through unprotected sexual contact through vaginal, oral, and anal penetration with an infected individual (Office of Women's Health, 2016). There are a few STIs that can spread by genital touching, pregnancy, breastfeeding, or sexual contact between two women (CDC, 2016b). These STIs are chlamydia, gonorrhea, human immunodeficiency virus (HIV), human papillomavirus (HPV), genital warts, genital herpes, and syphilis. STIs can cause serious or even life-threatening problems, such as pain or burning during urination, blisters, itching, and swelling around the genital area, worsening of the disease, fever, and bleeding (CDC, 2016a). STIs can also lead to producing children with congenital disabilities such as eye infections, blindness, and pneumonia (CDC, 2016a). Contracting an STI can also affect males and females through infertility, increased risk of contracting HIV, long-term pelvic pain, increased chance of spreading to blood and joints, increased risk of some forms of cancer, brain damage, heart disease, and even

death if not treated (CDC, 2016a). STIs can also cause testicular infections for males and ectopic pregnancies in females (CDC, 2016a). Therefore, risky sexual behaviors can negatively affect an individual for a lifetime.

One of the major factors contributing to STIs among the non-Hispanic, African American college student population is the lack of sexual education. For instance, many factors have been shown to contribute to the continued increase of STIs among the African American population, such as a lack of sexual education, social interactions, and risky sexual behaviors (Harling, Subramanian, Bärnighausen, & Kawachi, 2013). The CDC (2016b) has introduced STI prevention methods to help educate youth and young adults about the importance of practicing a healthy sexual lifestyle. One way the CDC uses to spread the knowledge of living a healthy sexual lifestyle is by partnering with health departments, healthcare providers, education systems, and non-government organizations. The CDC partnership assists these agencies through provisions of timely science-based information and by interpreting the information to the general public and policy makers (CDC, 2016a). However, this is not enough to slow down the epidemic.

Young adults should be exposed to some form of education on practicing healthy sexual behaviors and the adverse health outcomes associated with unhealthy sexual practices by the time they would have reached college. However, many studies on college campuses have shown that many of these students do not remember the importance of their sex education courses (Oswalt et al., 2015). Schools ensure that all students get educated on general positive health behaviors as a requirement for graduation from the secondary level (Boonstra, 2012). But college students could also benefit from this type

of course requirement at the freshman level. Sex education is a course that all individuals should have before engaging in sexual behavior (Stranger-Hall & Hall, 2011). It is the job of the school system to ensure that the college campuses are safe and healthy environments (Zhang, Kazi, & Gupta, 2015). The collaboration of educators, public health professionals, and the policy makers could introduce a required course for first-year students on all college campuses to help promote a safe and healthy sexual lifestyle among all students. This partnership would also contribute to educating new students on sex and the hope that their strategy could prevent future risky sexual behaviors and incidence on campus.

Sex education contributes to the sexual health of a population. The more individuals in a population know, the more likely the rates of STIs will decrease in the population (Advocates for Youth, 2009). Therefore, this study involved surveying college students enrolled at universities in the state of Virginia about their sexual behaviors and education to contribute to STI prevention by showing the outcome variations between sex education and sexual behaviors to meet the expectations of the CDC. The findings of this research can contribute to positive social change on Virginia university campuses by providing sustainability and improve the sexual health of the students. The study could also help to promote the Healthy People 2020 initiative by encouraging healthy sexual behaviors among the Virginia university campuses and strengthen policies on sexual education for college curriculums. This chapter will include the background of this research, the problem statement, the purpose of the study, and research questions and hypotheses. It will also contain a discussion on the theoretical framework, nature of

study, definition of terms, assumptions, scope and delimitations, study limitations, and the significance of the study.

Background

The National Sexuality Education Standards for U.S. public schools highlights the standards that the National Board of Education established to educate students who attend public schools in the United States (Boonstra, 2012). For example, the public school system contributed to healthier lifestyles and lower STI reports in HIV prevention in African American regions (Lloyd et al., 2012). Additionally, public school systems that use abstinence-only education to prevent pregnancy and STIs should include other related factors that influence sexual practices rather than relying on an abstinence-only curriculum (Stranger-Hall & David, 2011) such as condom use, contraception, stress, peer pressure, multiple sex partners, and drug and alcohol use.

Schools that have focused on providing sex education to prevent STIs and HIV have helped improve knowledge that can prevent the spread of these infections. A small community in Africa used a school-based sexual intervention program to prevent the spread of STIs and HIV infections (Paul-Ebohimhen, Poobalan, & Teijlingen, 2008). The prevention programs in schools helped educate students and avoid the spread of STIs among that African community. Additionally, because of 200,000 cases of HIV among adolescents and young adults due to engagement of sexual risk behaviors in New York (CDC, 2008), the City of New York Department of Education wanted to ensure their students received accurate and up-to-date information on HIV and STIs, so they updated their HIV and STI curriculum in December 2005 to a skill-driven, science-based, and

standards-based program. The program was able to provide skills and resources to more than 2,000 teachers, administrators, and parents to deliver the HIV and STI curriculum to the students of New York City (CDC, 2008). Over 1 year, the program also received additional funding from the state and the New York City Department of Health and Mental Hygiene to design and implement a HIV prevention peer leadership pilot program (CDC, 2008). According to the CDC (2008), the school-based HIV and STI prevention education programs implemented have bridged a gap between public health and education by helping young people take responsibility for their health and adopt healthy sexual behaviors. Reviewing programs like these may help public health professionals and educators make decisions on improving the sex education curriculum and standards among college campuses in the United States.

There is a need to improve college students' knowledge on sexual behaviors and prevention practices. A study on 356 college students indicated that the students had a relatively low mean score of 53.7 of 100 for sexual knowledge relating to masturbation, induced abortion, and contraception high (Choi & Ha, 2004). The students' experience of sexual intercourse was also 41.6% with a small difference between females and males (Choi & Ha, 2004). Therefore, there is a need for an integrated sex education program developed for college students (Choi & Ha, 2004).

Aside from low sexual knowledge, another reason to increase college students' knowledge on sex is their risky sexual behaviors. Research has shown that casual sex has been fairly common among college students (Grello, Welsh, & Harper, 2006). Additionally, condom use and unprotected sex was consistent with perceived cost and

sexual behaviors (Parsons, Halkitis, Bimbi, & Borkowski, 2000). Research has suggested that the most consistent predictors of sexual behavior are age at first intercourse, average number of partners, gender, and using seatbelts while driving, though safer sexual practices were not influenced by religion or having had a course on human sexuality (Baldwin & Baldwin, 1988). Sex related education must not rely only on programs designed to discuss sexually transmitted disease (STD) information but must also stress the importance of social responsibility, how to face risky activities, and healthy lifestyle habits (Baldwin & Baldwin, 1988).

This study was conducted to fill the gaps in knowledge by measuring the relationship between a students' exposure to sexual education and their chosen sexual behaviors. Most studies completed on sexual behavior among students' lack information of whether sexual experience influenced the results due to small samples and the subjects being unsure of their sexual conduct (Oswalt & Watt, 2013). There is also a limited amount of research on sexual education and its relationship with sexual behavior and STI incidence (Oswalt et al., 2015). For researchers to understand if there is an association between sexual education and participation in risky sexual behaviors among Virginia college students, it was useful to evaluate the sexual practices and knowledge of these students.

Problem Statement

There are 20 million reported cases of STIs in the United States each year (Virginia Department of Health [VDH], 2015). Many of the cases reported are of adolescents and young adults. Reports also show that about 10 million Americans, ages

15-24 years, are diagnosed with an STI per year (CDC, 2015). The cases of reportable STDs among young people 15-24 years for Virginia in 2013 were 27,178 compared to the 1,138,639 cases in the United States (CDC, 2014; see Table 1).

College students are part of a diverse population that makes up 25% of all sexually active young adults in the United States, meaning that a quarter of the U.S. population is at risk of STIs because of their lack of sexual education and practicing of safe sexual behavior (Zhang et al., 2015). The most recent data from the CDC shows that both the numbers and rates for STIs among the college student population has increased for the year 2015 (Zhang et al., 2015). Moreover, African Americans make up less than 20% of Virginia's population, and of that 63% were diagnosed with the STI gonorrhea in 2013 (VDH, 2015). Further, the American College Health Association (ACHA, 2006) reported that from 2004-2014 the chlamydia and gonorrhea rates almost doubled among college students in the United States (Zhang et al., 2015).

Table 1

2013 Rates of Reportable STDs Among People 15-24 in Virginia and the United States per 100,000

	Virginia		U.S. excluding outlying areas	
	Cases	Rate	Cases	Rate
Chlamydia	22,966	2,024.1	949,270	2,160.2
Gonorrhea	4,124	363.5	185,127	421.3
P&S Syphilis	88	7.8	4,542	10.3

Note. Data is from the National Electronic Telecommunications System for Surveillance, CDC. CDC/NCHS 2012 bridged population estimates, derived from U.S. Census data, used for rate denominators.

College students are known for participating in behaviors such as partying, drug use, underage drinking, and engaging in higher risk sexual behaviors (Foster, Caravelis, & Kopak, 2013). All of these actions can lead to STIs (Hittner, Ownes, & Swickert, 2016). Because college students experience a significant change in residential status and freedom, their independence is increased, which often heightens the opportunity for sexual exploration with not only one partner but with multiple partners (Wright, Randall, & Hayes, 2012). Such behaviors are correlated with an increased risk of contracting an STI and unknowingly spreading it around campus and potentially other universities as well (Hittner et al., 2016). According to Eisenberg, Lust, and Garcia (2014), 31% of college students in the United States reported that they did not use a condom during sexual intercourse, and 30% of the group indicated that it was a stranger or new partner. The ACHA (2005) found that 52% of college students reported to have unprotected sex in the past 30 days, and out of this group there were 53% who had inconsistently use condoms.

Although STI interventions and prevention programs are available in Virginia, the number of cases reported annually have not decreased (VDH, 2015). For instance, there are multiple intervention programs and community projects available to help eliminate the spread of STIs such as gonorrhea, Chlamydia, and syphilis among African American young adults in Virginia, but there were a total of 41,000 Virginians diagnosed with gonorrhea, chlamydia, or syphilis infection in 2013. That is an 8% increase from 2012 (VDH, 2015). New reports have stated that African American youth in Virginia account for 40% of the recent cases reported for STIs compared to only 16% of Caucasian youth

(CDC, 2016b). Virginia is currently ranked 28th among all states for total cases of gonorrhea and the second most frequently reported for other STIs in the United States (VDH, 2015).

Public health professionals believe that to prevent the spread of STIs education is critical. Researchers have shown that youth have the highest rate of behavior change, so these prevention efforts may help to contribute to STI prevention within this population (Stranger-Hall & Hall, 2011). Introducing high school students to STI education as part of a school health and physical education curriculum may contribute to the decrease in STI incidence among the American college student community. STI education is critical because about 75% of the youth who enter college will experience some form of sexual intercourse and may engage in risky sexual behaviors (Cashwell, Giordano, King, Lankford, & Henson, 2016). However, in Virginia the education on sexual health provided in school health and physical education curriculum is limited to content that the Virginia School Board suggests is appropriate for high school aged students, and often there is more focus on the standards of learning curriculum (Virginia Board of Education, 2012). In 2012, the Virginia Board of Education reviewed their current sexual education lessons and noticed that the information did not focus on the seriousness of contracting STIs, but instead used scare tactics focused on abstinence, morals, values, and how to deny sex (Virginia Board of Education, 2012). Often, young adults do not refuse sex, and individuals are uneducated about STIs (Stanger-Hall & Hall, 2011). Problems may arise because many young adults will forget the information discussed in their school-based

sex education lessons related to contracting STIs and will engage in risky behaviors such as unprotected sex (Virginia Board of Education, 2012).

In addition to state standards for sex education, the National Sexuality Education Standards were established to address the critical issues the nation faced with regarding sex (Boonstra, 2012). Although these standards are in place, some educators are still undecided as to whether they cover enough to prevent STIs among young adults (Boonstra, 2012). Educators have reviewed sex education programs to determine if there was a need for a course that addresses the key issues included in the National Sexuality Education Standards (Stranger-Hall & Hall, 2011). This review has led to a debate as to whether abstinence-only information should be taught in secondary schools throughout the United States (Stanger-Hall & Hall, 2011). For researchers to understand if there is an association between sexual education and participation in risky sexual behaviors among Virginia college students, it may be useful to evaluate the sexual behaviors and knowledge of these students.

Purpose

The purpose of this quantitative research study was to measure the relationship between student exposure of health promoting sexual education and their current sexual practices. The independent variable in this study was sexual education. Sexual behavior was the dependent variable and the covariate variables were demographics (race, sex, age), unprotected sex, drug and alcohol use and abuse, multiple sex partners, and condom use.

Many studies have been conducted to understand how students react to sexual education, but there are still misconceptions of why college students seem to have a high rate of STI incidence (Zhang et al., 2015). Studying college students who attend Virginia universities may help determine if the sexual education initiative has had an influence on the sexual behaviors of African American college students attending Virginia universities.

Research Questions

Research Question 1: What is the relationship between sexual education and participation in risky sexual behaviors (unprotected sex, multiple sex partners, condom use, and drug and alcohol use and abuse) among college students attending universities in Virginia?

$H_0$1: There is no relationship between sexual education and participation in risky sexual behaviors among college student attending universities in Virginia.

H_a1: There is a relationship between sexual education and participation in risky sexual behaviors among college student attending universities in Virginia.

Research Question 2: What is the relationship between having a sexual education program and being diagnosed with an STI among college-aged students in Virginia, adjusting for potential confounders?

$H_0$2: There is no relationship between having a sexual education program and being diagnosed with an STI among college-aged students in Virginia, adjusting for potential confounders.

H_a2: There is a relationship between having a sexual education program and being diagnosed with an STI among college-aged students in Virginia, adjusting for potential confounders.

Research Question 3: Controlling for all other potential risk, what is the association between student participation in risky sexual behaviors and race among college-aged students in Virginia?

$H_0 3$: There is no association between student participation in risky sexual behaviors and race among college-aged students in Virginia.

$H_a 3$: There is an association between student participation in risky sexual behaviors and race among college-aged students in Virginia.

Research Question 4: What are the students who attend a university in Virginia perceptions about having a sexual education course added to their college curriculum to help prevent them from contracting STIs?

$H_0 4$: The students who are attending a university in Virginia will believe that including a sexual education course in the curriculum will help prevent them from contracting STIs.

$H_a 4$: The students who are attending a university in Virginia will not believe that including a sexual education course in the curriculum will help prevent them from contracting STIs.

Research Question 5: What are the college-age students in Virginia perceptions about the chances of contracting an STI if they do not use a condom during sexual intercourse?

$H_0$5: The college-age students in Virginia believe that they will have a chance of contracting an STI if they do not use a condom during sexual intercourse.

H_a5: The college-age students in Virginia believe that they will not have a chance of contracting an STI if they do not use a condom during sexual intercourse.

Theoretical Foundation

The theory that influenced this study is the health belief model (HBM). The HBM was developed to discuss why people did not participate in programs that could help them diagnose or prevent disease (Becker, Maiman, Kirscht, Haefner, & Drachman, 1977). It was believed that to engage in healthy behaviors the intended audiences need to be aware of their risk (Becker et al., 1977). In this study, the students needed to be aware of their risk for STDs and other life-threatening diseases and understand that the benefit from changes in behavior can outweigh the potential barriers or other negative aspects of recommended actions (see Schiavo, 2007). According to Pechmann (2001), the HBM is also known as a risk learning model because the goal is to teach new information about health risks and the behaviors that minimize those risks. The HBM guided the research by introducing knowledge among the Virginia college campuses to bring change and assist in the prevention of STDs. This method brought information to the students using an educational approach focused on messages, channels, and spokespeople (Schiavo, 2007). The HBM identifies the rationale for which individuals choose to partake in preventative behaviors. The HBM was appropriate for this study because it aligns with previous research and provided a framework for the researcher to further understand the

relationship between the domains of the HBM and sexual education and behaviors (Glanz, Rimer, & Lewis, 2002; see Figure 1).

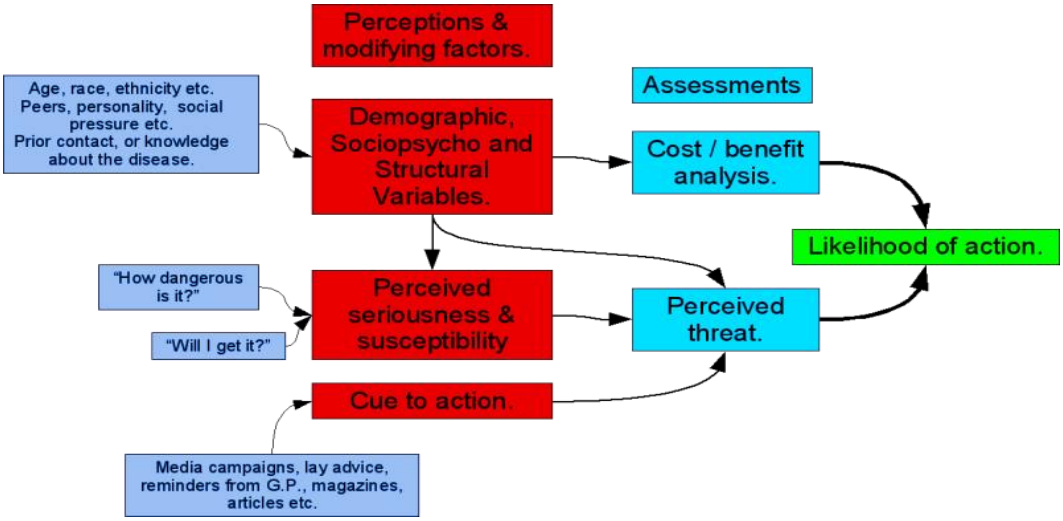

Figure 1. Health belief model. Adapted from *Health Communication from Theory to Practice* (p. 38), by R. Schiavo, 2007, San Francisco, CA: Jossey-Bass.

Nature of the Study

This nonexperimental, cross-sectional study was conducted to examine the relationship between sex education and sexual behaviors among college students enrolled in Virginia universities. Cross-sectional designs are nonexperimental designs that allow researchers to test a hypothesis in a natural setting when experiments are unethical or impossible (Frankfort-Nachmias et al., 2008). Nonexperimental designs are preferred when using a survey strategy of inquiry (Frankfort-Nachmias et al., 2008). The results collected from the survey instrument assisted in determining the relationship between the student's exposure to sex education and their sexual behaviors. The rationale for this design was based on previous research done by the ACHA (2016) with the National

College Health Assessment (NCHA). In 2000, the ACHA administered the NCHA, an anonymous survey, to participating college campuses throughout the United States. The NCHA is now nationally recognized for assisting in the collection of data about students' health, habits, behaviors, and perceptions. The ACHA then determined that the NCHA survey is a reliable tool to measure the incidence of STD's and sexual behaviors among college campuses. Quantitative, cross-sectional research was appropriate to gauge the relationship between sexual education and sexual behaviors to include unprotected sex, condom use, alcohol and drug use, and multiple sex partners.

The study included current college students from Virginia universities who were 18-24 years old and agreed to participate in the study. The total number of students who were eligible to participate in the STI education study was determined by if they attended a university in Virginia and if they were between the 18-24 years old. This study assessed the relationship between sexual education and sexual behaviors, focusing on reported STI cases among respondents. To evaluate the relationship of sex education, sexual behaviors, and other indicators, I administered each student a questionnaire. The survey determined their level of STI education, their sexual behaviors to include unprotected sex, multiple sex partners, condom use, healthcare, partner risks, sexual addictions, and alcohol and drug abuse, and other demographic information such as race, sex, and social status. Descriptive statistics were used to analyze the data collected from the surveys. The statistical correlation and relationships between the variables was analyzed using linear regression. The research aligned with the research questions and hypothesis (Creswell, 2009).

Definition of Terms

Adolescent invulnerability: Term used to describe the mind frame of teens and young adults ages 15-24 years because of their belief that they are impervious to the consequences of their actions (Bryant & Chavious, 2014).

Chlamydia: A common STD that can infect both men and women. It can cause serious, permanent damage to a woman's reproductive system (CDC, 2016b).

Epidemiology: The branch of medicine dealing with the incidence and prevalence of disease in large populations and detection of the source and cause of epidemics of the infectious disease (dictionary.com).

Gonorrhea: Is an STD that can infect both males and females and can cause infections in the genitals, rectum, and throat (CDC, 2016b).

Health behavior: Is the action taken in the absence of observable illness and includes primary prevention and secondary prevention (Bryant & Chavious, 2014).

Human Immunodeficiency Virus (HIV): Is a virus that weakens a person's immune system be destroying important cells that fight disease and infection (CDC, 2016b).

National Survey of Family Growth: The organization that gathers information on the family, life, marriage and divorce, pregnancy, fertility, use of contraception, and men's and women's health (CDC, 2016b).

Risky sexual behavior: Is the behavior that increases the probability of negative consequences associated with sexual contact, including AIDS or other STIs (Bryant & Chavious, 2014).

Sexual assault: It is any forced or coerced sexual contact or behavior that happens without consent, to include rape and attempted rape, molestation, and sexual harassment and threats (Womens Health, 2016).

Sexual behavior: A person's sexual practices (McGraw-Hill Concise Dictionary of Modern Medicine, 2002).

Sexual debut: First sexual encounter (Cavazos-Rehg et al., 2009).

Sexual intercourse: Any physical exchange between individuals involving stimulation of the genital organs (dictionary.com).

Sexually Transmitted Infections (STIs): Also known as STDs and are infections spread by vaginal, oral, or anal sex (Womens Health, 2016).

Syphilis: An STD that can cause long-term complications if not treated correctly (CDC, 2016b).

Youth Risk Behavior Survey: A system that monitors six types of health-risk behaviors that contribute to the leading causes of death and disability among young people and adults (CDC, 2016b).

Assumptions

This study was limited to students between the ages of 18-24 who were currently attending Virginia universities. The major assumption was that those exposed to sexual education that included topics on STIs and safe sexual behaviors had a decreased risk of unhealthy sexual behaviors. Another assumption was that the participants who responded to the survey were honest when answering the survey questions and the survey questions and terms were clear and understood by each participant. Due to the information

collected from the literature regarding sex education and sexual behavior, it was assumed that the information was reliable and accurate. It was also assumed that the participants provided accurate information.

Scope and Delimitations

I targeted all female and male college students currently enrolled in a Virginia university between the ages of 18-24. The study purpose was to analyze the relationship between sexual education and the practice of risky sexual behaviors among the college students. The results of this study were limited to the college students who attend Virginia universities. Therefore, the results cannot be generalized to other universities outside of Virginia. The results also cannot be generalized to individuals who have not enrolled in college. I used the data to determine if there is a significant association between the two variables. However, the study helped in developing a partial understanding of why STI incidence continues to increase among the college student population.

Limitations

The restriction of this study included bias from self-report of the students STI knowledge and behaviors. The study also was limited due to nonresponse bias because the missing information could have made a significant difference to the overall results (Creswell, 2009). There were also limitations of the students' memory of their sexual history causing inaccurate results or biased recall. Additionally, the students may have responded to the self-reported survey with responses that are more likely to be socially desirable rather than truthful. Another limitation of this study was the students'

willingness to participate. Many of the students selected to participate may have felt uncomfortable answering the survey online. Some participants may have felt that it was inappropriate to discuss their personal sex encounters with persons other than their health providers. Moreover, participation was viable to this study so the phenomenon where those who are interested in health and participating in healthy behaviors were also more likely to fill out a survey.

Significance

Today, researchers know more about STIs, and public health organizations have developed programs designed to treat and control them (CDC, 2016b). However, there is little understanding of why STIs are high across college campuses (Zhang et al., 2015). The purpose of this study was to measure the relationship between student exposure of health promoting sexual education and their current sexual practices. This study was aimed at assisting public health professionals assess how students' past sexual education regarding healthy sexual behaviors and STI knowledge is associated with their current personal sexual behaviors. The information could also be used to assist the Virginia Education Board to determine whether the college curriculum should include sex education courses to help the public health initiative of decreasing STIs in Virginia.

The results from this study can help school professionals and students to understand the seriousness of sex education. The results could motivate more public health organizations to implement well-designed public education campaigns. The results can also make a positive impact on public opinion, target specific audiences, and be a cost-effective way of providing critical information to a large number of people. For

example, it can enhance community understanding of the nature and value of the STI and HIV prevention program. On a social change perspective, this study was intended to identify the relationship between sexual behavior and past education of college students. The comparison between the two factors can help the public health experts identify if previous sexual education has a significant effect on the current sexual practices that college student is engaged in. The study could help Virginia college professionals promote healthy sexual behaviors, strengthen the campus sexual education policies, decrease STI incidence among students, and increase access to prevention of STIs. The findings can also help provide sustainability among the college student population and improve sexual health and contribute to the Healthy People 2020 initiative.

Summary

This study was an investigation of the association between past sexual education and participation in risky sexual behavior among college students who attend Virginia universities. The amount of STI cases reported by the CDC for adolescents and young adults are high of Virginia's STI cases compared to the rates of that same age group in the United States (see Table 1). Conducting a study to highlight how the lack of education is contributing to the increased risky sexual behaviors among college students can improve the health of this community. The National Education Standards suggest that abstinence-only curriculum is taught; however, data is not supporting the abstinence-only strategy anymore because STI reported cases are still increasing among the African American population age 15-24 years (Stranger-Hall & Hall, 2011).

Chapter 2 will include the relevant literature and the epidemiology of STIs and how social, behavioral, and education factors can influence STI incidence. Chapter 2 will also provide an explanation of why sex education can affect STI incidence on college campuses. An overview of the research on the theoretical models that influenced this study is also discussed in Chapter 2.

Chapter 2: Literature Review

Introduction

Half of all newly reported cases of STIs in the United States are of teens and young adults (Hittner, Owens, & Swickert, 2016), and college students are among the age group of 15-24 years old where the incidence of STIs is highest (CDC, 2016b). There are many factors that contribute to why and how college students remain among the highest reported STIs every year such as misunderstanding what STIs are, the lack of sexual education, demographics, and sexual behaviors (Wilton, Palmer, & Maramba, 2014). However, there is a gap in STI research as well as higher education literature on the STI prevention needs of college students (ACHA, 2013; Wilton et al., 2014). The 2013 NCHA II survey showed that college students are engaging in higher frequencies of unprotected sex, suggesting the need for the development, implementation, and evaluation of STI prevention efforts on college students (ACHA, 2013). But more research needs to be conducted to understand why the college student population has a high incidence of STIs.

Most college students are new to being independent and unsupervised as they adjust to their new surroundings (Foster et al., 2013). Many students engage in risky behaviors such as unsafe sexual practices and alcohol and drug use during their first year (Foster et al., 2013). Often, college students do not realize that participating in these activities can be unhealthy (Hittner et al., 2016). Practicing such risky behavior can become a societal burden because of the spread of the disease to others, increased health care cost, and a diminished quality of life (Hittner et al., 2016). Thus, the purpose of this

research was to measure the relationship between student exposure to sexual education and their current sexual health behaviors. Many studies have been conducted to understand how students react to sexual education, but there are still misconceptions of why college students have such high rates of STI incidence (Zhang et al., 2015). Studying college students who attend Virginia universities may help determine if the sexual education initiative has had an influence on the sexual behaviors of this population.

In this literature review, I discuss the current research on the connection between sexual education and sexual behaviors. The main risk factors highlighted in this review are age, race, gender, education, and sexual behaviors as well as the factors related to the risky sexual practices. These behavioral factors include unprotected sex, condom use, abstinence, multiple sex partners, drug and alcohol use and abuse, and social setting. The sections in this chapter include the literature search strategy, theoretical foundations, epidemiology of STIs, social, behavioral, and educational factors associated with STIs among college students. As discussed in the previous chapter the study is guided by the HBM.

Literature Search Strategy

The Walden University Library and Google Scholar were used to search for literature. The Walden University library was used to search literature included in databases such as MEDLINE, ProQuest Health & Medical Complete, CINAHL, and PubMed. Found within the databases are peer-reviewed journal articles, books, and other literature. The key terms used were *sexual education, age, abstinence, condoms, STIs,*

STDs, college students, oral sex, drug abuse, alcohol abuse, and *sexual behaviors*. All literature was limited to the years 2006 to 2016.

Theoretical Foundation

Health Belief Model

One of the most widely used and recognized conceptual frameworks of health behavior is the HBM (Green & Murphy, 2014). The HBM is used to focus on behavioral change at the individual level. The underlying premise of the HBM is that individuals will practice healthy behaviors according to their own beliefs (Green & Murphy, 2014). The model identifies six aspects of assessment which the individual perceives: susceptibility, severity, self-efficacy, actions, barriers, and benefits (Schiavo, 2007; see Table 2). Originally the HBM was developed to understand why people failed to participate in programs to prevent and detect disease (Schiavo, 2007). Over time researchers began to believe that its consequences or reinforcements determine the frequency of the behavior.

The HBM is also known as a risk learning model because the goal is to teach new information about health risks and the behaviors that minimize those risks (Pechmann, 2001). The HBM helps identify the rationale for which individuals choose to partake in preventative behaviors. The HBM could help introduce knowledge among the Virginia college campuses to assist in the prevention of STIs by bringing information to students using an educational approach focused on messages, channels, and spokespeople (Schiavo, 2007). Additionally, college students need to be aware of the risk of STIs and other life-threatening diseases and understand that the benefit from changes in behavior

can outweigh the potential barriers or other negative aspects of recommended actions (see Schiavo, 2007). Therefore, behavior can become associated with an immediate reward to increase the probability of the behavior repeated (Skinner, Tiro, & Champion, 2015).

Table 2

The Six Concepts of the Health Belief Model

Concept	Definition	Connection to this research
Perceived seriousness	How severe is a certain health condition and is measured in comparison to other illnesses (Rosenstock, 1990)	How serious are the consequences of engaging in sexual activity and severe do Virginia university students think STIs are?
Perceived susceptibility	The extent to which individuals see themselves at risk of contracting a disease (Rosenstock, 1990)	How susceptible are Virginia university students to STIs?
Perceived benefits	What patients perceive they would derive from their adhering to a certain treatment (Rosenstock, 1990)	What are the benefits of wearing protection during sexual activity?
Perceived barriers	What patients perceive they would have to overcome to adhere to treatments (Rosenstock, 1990)	What are the barriers to engaging in safe sexual behaviors?
Cues to action	What motivates people to do a certain health behavior (Rosenstock, 1990)	What motivates students to practice safe sexual behaviors?
Self-efficacy	The belief in one's own personal ability to follow through with a particular action (Rosenstock, 1990)	How much control do I have over protecting myself from STIs or from practicing safe sexual behaviors?

The HBM aligns with previous research in further understanding the relationship between the domains of the HBM and sexual education and behaviors (Glanz et al., 2002). For example, Montanaro (2014) used the HBM to compare theories based on condom intervention by experimentally manipulating the core constructs of the HBM and the theory of planned behavior. Montanaro focused on interventions to increase preparatory condom use behavior performed based on the two theories. The HBM was also used in a study to evaluate the use of the HPV vaccine among young men in the United States, which led to improvements in the HBM experimental group and changes

in attitudes and beliefs regarding HPV and HPV vaccinations (Mehta, Sharma, & Lee, 2014).

The HBM could also help researchers determine whether the various methods used by school systems to educate their students allows students to absorb and understand the information and make healthy decisions regarding their sexual behaviors. For instance, the HBM may explain how school-based sex education lessons influence current African American college students to practice safer sexual behaviors. This approach may allow the opportunity for public health researchers to understand how the public school system prepares students to make educated and more secure decisions regarding sex. The HBM could help specify the consequences of the risk and conditions related to sexual educations and sexual behavior. This theory may also contribute promoting healthy lifestyles and sexual health among the college student population. The college students will be more likely to perform health-related behaviors if they perceive a disease as being serious, feel that there is a risky of contracting the disease, believe it will be a positive outcome if the health actions outweigh the barriers, and they can use cues to take action (Denny-Smith, Bairan, & Page, 2006). Therefore, the HBM was appropriate for this research study because it helps to build on existing knowledge that motivates behavior change to help prevent the risky sexual behavior.

Literature Review

Epidemiology of STIs

According to the CDC (2016b), STIs, formerly named STDs, are infections that pass during oral, anal, or vaginal sexual contact. The reason for the name change is that

the term disease means a serious medical problem and several of the most common STDs have no signs or symptoms in the person infected (American Sexual Health Association, 2016). STIs include chlamydia, gonorrhea, syphilis, genital herpes, genital warts, HIV, and trichomoniasis, and are considered worldwide and caused by bacteria and viruses (Gewirtzman et al., 2016). The unique risk factors for STIs are unprotected sexual practices, multiple sexual partners, sexual violence, and alcohol and drug use that leads to poor sexual health decisions (CDC, 2016b). STI symptoms can include abnormal vaginal discharge, a burning sensation during urination, discharge from the penis, pain and swelling in testicles, and rectal pain, discharge, and bleeding. Not all STIs will present symptoms so an individual may not be aware that they are infected with an STI (CDC, 2013). STIs that do not present symptoms are dangerous because the individual can continue to spread the STI and could cause more severe health outcomes in the future (CDC, 2013). STIs are a major concern for public health because they are a substantial health challenge and a potential threat to an individual's immediate and long-term health and well-being (CDC, 2016a).

STIs are primarily high among young males and females ages 15-24 (CDC, 2016b). According to the CDC (2016b), STIs cases reported for the current year made up 27% of the sexually active population and 50% of the 20 million new STI cases is between young adults ages of 15-24. This population also accounts for risky groups such as African Americans and American Indians/Alaska Natives.

Two of the most common STIs are gonorrhea and chlamydia (Gewirtzman et al., 2011). Chlamydia is reported in a frequency higher than any other STIs in the United

States (Gewirtzman et al., 2011). According to the World Health Organization (2016) there are over 90 million new cases of chlamydia diagnosed per year in the world, with more than 4 million of those cases per year occurring in the United States (World Health Organization, 2016). The CDC (2013) reported that there were 2.9 million (63% of all young adults ages 15-25) cases of chlamydia reported for the year 2013 in the United States. Chlamydia rates for Virginia had a 7% increase between the years 2009 and 2014. VDH (2016) reported 35,725 new cases of Chlamydia for the year 2014 with the 5-year average number of cases being 33,319. The VDH report also indicated that the highest incidence rate of chlamydia in Virginia was among the 20-29-year age group with 1,799 per 100,000 cases and the 10-19-year age group with 878 per 100,000 cases followed not too far behind (VDH, 2016).

Although chlamydia is the most reported STI, gonorrhea is the second most reported and is also has the highest incidence among adolescents, young adults, and African Americans in the United States (American Sexual Health Association, 2016). In 2006, a report was released on gonorrhea that stated 69% of gonorrhea cases were of African American men and women ages 15-19 (Gewirtzman et al., 2011). The gonorrhea rate for Virginia was 8,196 per 100,000 cases with the 5-year average number of cases being 7,120 per 100,000 in 2014. That is a 15% increase in the 5-year average from 2010 to 2014 for gonorrhea in Virginia. The rate of gonorrhea was also the highest among the 20-29-year age group with 396 per 100,000 cases followed by the 10-19-year age group with 166 per 100,000 cases for Virginia over the past ten years (2005-2014). The CDC (2014) estimated that up to half of gonorrhea infections were undiagnosed and

unreported. The 2014 incidence rate of gonorrhea (99 cases per 100,000) for Virginia was below the most recently reported national rate of 111 per 100,000 cases (VDH, 2014). Despite these rates, rates for HPV (14 million cases), HIV (45,000 cases with age exception of 13-24 years), genital herpes (776,000 cases), and syphilis (75,000 cases) were not as high for the United States for 2014 (CDC, 2016b). Although these were among the less reported STIs, the overall incidence of STIs in the United States continue to increase within certain populations and rural areas (CDC, 2016b).

Treatment for STIs is dependent on the type of STI diagnosed. Most STIs are treated using antibiotic medications (CDC, 2015). The antibiotic medications are prescribed as either a cream, injection, or pill form (CDC, 2015). Chlamydia is treated immediately after diagnosed with the oral single dose of Azithromycin or twice a day for seven days with doxycycline to prevent adverse reproductive health complications and continued sexual transmission (CDC, 2016b). Gonorrhea is treated with a dual therapy of antibiotics due to its tendency to become resistant to treatment (CDC, 2016b). Individuals diagnosed with gonorrhea are treated with 250 mg single dose injection of ceftriaxone and a single oral dose of azithromycin (CDC, 2016b). The CDC (2016b) recommends that other forms of treatment to prevent reinfection include abstaining from any form of sexual practice for seven days after treatment, complete all medication, ensure all sexual partners are successfully treated and getting rechecked for the infection three months after treatment.

Social, Behavioral, and Educational Risk Factors

Age/First Sexual Encounter/Debut

Young age is a significant factor for STI risk (CDC, 2016a). Individuals between the ages of 15-24 have an increased chance of contracting an STI because of their choice of unprotected sex and other risky sexual behaviors. According to Epstein, Bailey, Manhart, Hill, and Hawkins (2014a), a certain amount of risk is associated with sexual exploration. Therefore, many scholars view adolescent sexual activity as a major problem. Early experiences with sex often depart from what socially defines as appropriate for a certain age or a stage of the life cycle (Epstein et al., 2014a; Kowaleski-Jones & Mott, 1998). Individuals who experience sexual intercourse at early ages are at an increased risk for STIs and pregnancy because they are less likely to use condoms (Epstein et al., 2014a; Lonczak, Abbott, Hawkins, Kosterman, & Catalano, 2002). Researchers have further mentioned that sexual behavior among adolescents and young adults usually are accompanied by other problems and behaviors such as alcohol and drug use (Kowaleski-Jones & Mott, 1998). Additionally, sexual experiences among youth and young adults are related to engaging in casual sex with multiple partners (Epstein et al., 2014b).

During adolescent years many young people begin to experiment with new practices such as the exploration of sexual activities that vary by gender, race, and ethnicity (Kowaleski-Jones & Mott, 1998). Late adolescence is the time of self-exploration and identity development (Oswalt & Watt, 2013). In a study using the 2006-2010 National Survey of Family Growth there were 74% of young women and men in the

United States experiencing some form of sexual intercourse by age 20 (Finer & Philbin, 2013). Further, the CDC (2015) used the Youth Risk Behavior Survey and reported that 78% of high school students would experience a form of a sexual encounter by age 18 years and 3.9% of American youth by age 13 years (CDC, 2016b).

Initial sexual encounters are categorized as the time of the first sexual experience. In the United States, the median age of first sexual intercourse is 17 years for males and 17.3 years for females (CDC, 2017). Research has indicated that there are significant proportions of African-American youth who experience sexual intercourse earlier than other racial groups (Cavazos-Rehg et al., 2009; Moilanen, Leary, Watson, & Ottley, 2015). Additionally, research has suggested that the Asian male and females experience sex much later than all groups, with one study showing the probability for sexual debut among all individuals by age 17 years was less than 35% for Asians (females at 28% and males at 33%; Cavazos-Rehg et al., 2009). This same study showed that probability was less than 60% for Caucasians (females at 58% and males at 53%), less than 70% for Hispanics (females at 59% and males at 69%, and greater than 75% of African Americans (females at 74% and males at 82%; Cavazos-Rehg et al., 2009). Therefore, there is a need for sexual education programs and policy to be sensitive to the roles of race and ethnicity in sexual debut (Cavozos-Rehg et al., 2009).

Another affecting a young adult's first sexual experience include traumatic experiences, which helps predict cautious sexual behavior. For instance, Abbott and Dalla (2008) mentioned that the initiation of intercourse at a young age is affiliated with a likelihood of having involuntary or unwanted sex. They also further mentioned that a

traumatic event during adolescence, such as sexual abuse, is very common with earlier sexual debut (Abbott & Dalla, 2008). The age of youth and young adult's first sexual encounter is currently 16.7 years of age (Zhang et al., 2015). The most consistent predictor of cautious sexual behavior is the age of first intercourse (Baldwin & Baldwin, 2010).

In 2011, the Youth Risk Behavior Survey reported that the biggest problem with STIs is sexual behaviors (Zhang et al., 2015). Sexual behavior that contributes to an STI is considered one of the six categories of priority health-risk behaviors among youth and young adults (Zhang et al., 2015). As mentioned earlier, young adults account for 50% of the 19 million newly reported STI cases per year in the United States. The young adult population accounts for 25% of the sexually active community, and the college student population accounts for a significant portion of the 25% (Zhang et al., 2015). STIs can affect students' health and their future. It is important to review the age of sexual debut across different social, demographic, and racial groups to understand the effects that culture and education have on sexual health (Cavazoz-Rehg et al., 2009).

Race

Youth and young adults who are among ethnic minority groups have an increased risk to contract STIs. According to Hendrickx, Phillips, and Avonts (2008), young adults of ethnic minority groups are at an increased risk of acquiring an STI. The risk is commonly due to the attainment of sexual educational and the social status associated with this population (Hendrickx et al., 2008). Many public health agencies are working

with their communities to stop the STI epidemic among youth and young adults (CDC, 2016b).

African American young adults are the population with the highest risk of contracting STIs (CDC, 2016b), leading to a disproportionate burden of most STIs (Einwalter et al., 2005). Moreover, African Americans make up less than 20% of Virginia's population but comprise 63% of Virginia's diagnosed gonorrhea cases in 2013 (VDH, 2015). Research shows that African American youth in Virginia account for 40% of the recent cases reported for STIs compared to only 16% of STIs reported for Caucasian youth (CDC, 2016b).

Sex Education

Sex education implementations over time have not been effective enough to decrease the reports of STIs among college campuses. Zhang et al. (2015) previously wrote that sexual education needs strengthening because of dire implications of STIs and that appropriate intervention measures are not reaching the youth and young adults. Analyzing the factors which affect college students' sexual behavior could provide the scientific reason for implementing sexual education within the college curriculum (Zhang et al., 2015). Studies have shown that college students have relevant knowledge of STIs, but they continue to engage in risky sexual behavior (Zhang et al., 2015).

Previous research has found that youth have the highest rate of behavior change, so prevention efforts, such as sexual education, may help to contribute to STI prevention within this population (Stranger-Hall & Hall, 2011). Introducing high school students to STI education as part of a school health and physical education curriculum may

contribute to the decrease in STI incidence among the American college student community. Educating students of sex is imperative because about 75% of the youth who enter into college will experience some form of sexual intercourse and may engage in risky sexual behaviors (Cashwell, Giordano, King, Lankford, & Henson, 2016). Teens and young adults could effectively communicate STI prevention amongst themselves due to their ability to spread information from one to the other (Stranger-Hall & Hall, 2011).

In Virginia, the education on sexual health provided in the school system health and physical education curriculum is limited to content that the School Board suggests appropriate for high school aged students (Virginia Board of Education, 2012; 2016). In 2012, the Virginia Board of Education reviewed their current sexual education lessons. The board noticed that the information did not focus on the seriousness of contracting an STI, but instead used scare tactics that focused on abstinence, morals, values, and how to deny sex (Virginia Board of Education, 2012). Often, students will not deny sex and individuals are uneducated about STIs (Stanger-Hall & Hall, 2011). Problems may arise because many young adults will forget the information discussed in their school based sex education lessons related to contracting STIs and will engage in risky behaviors such as unprotected sex (Virginia Board of Education, 2012).

The Virginia school system focuses more on the Standards of Learning Curriculum, which does not allow much time for sexual education (Virginia Board of Education, 2012). The National Sexuality Education Standards were established to address the key issues the nation faced with regarding sex (Boonstra, 2012). Although these standards are in place, some educators are still undecided as to whether they cover

enough to prevent STIs among young adults. Educators have reviewed the sex education program to determine if there was a need for a course that addresses the key issues included in the National Sexuality Education Standards (Stranger-Hall & Hall, 2011). This review has led to a debate as to whether the abstinence-only information should be in secondary schools throughout the United States (Stanger-Hall & Hall, 2011).

Moreover, a theory-based social development study that promoted academic success, social competence, and bonding to prevent early sexual intercourse found that implementing similar programs within the first and secondary schools can help reduce risky sexual practices and adverse health consequences at the beginning of adulthood (Lonczak et al., 2002). The program followed up with the study subjects at age 21. The individuals reported that the program helped reduce the probability of contracting STIs by age 21 for African American and other ethnic groups with the treatment group, while single individuals reported an increase in condom use preventing pregnancy and experiencing birth before age 21 (Lonczak et al., 2002). Early sexual activity can result in some devastating and life-changing implications. This underscores the importance of prevention-focused research (Lonczak et al., 2002). Lonczak et al. (2002) concluded that following a controlled based theory, the social development model proved that strong bonds to school and family protect youth and young adults against socially unacceptable behaviors, including early sexual intercourse and unprotected sexual activities.

Many studies have been conducted to understand how students react to sexual education, but there are still misconceptions of why college students have a higher rate of STI incidence (Zhang et al., 2015). College students are known for participating in risky

behaviors such as partying, drug use, underage drinking, and having unprotected sex (Mair, Ponicki, & Gruenewald, 2015). All of these actions increase the risk of being exposed to STIs. College students leave home and enter into a new world where their residential status and freedom has a significant change. Often, their independence increases also increasing the opportunity for sexual exploration with not only one partner but with multiple partners while attending college (Wright, Randall, & Hayes, 2012). Such behaviors are correlated with increased risk to contract an STI and unknowingly spread it around campus and potentially other campuses as well. According to Eisenberg, Lust, and Garcia (2014), 31% of college students in the United States reported that they did not use a condom during sexual intercourse and 30% of the group indicated that it was with a stranger or new partner. A 2005 study conducted by the ACHA (2006) found that 52% of college students reported having unprotected sex in the past 30 days, and out of this group, there were 53% who had inconsistently use condoms. Analyzing how factors can help to improve the basis for sexual health education could improve the STI incidence among the college students in Virginia universities.

There are multiple intervention programs and community projects available to help eliminate the spread of STIs such as gonorrhea, chlamydia, and syphilis amongst the African American young adults in Virginia. Although STI intervention and prevention programs are available, the number of STI cases reported annually has not decreased. For example, the VDH reported 41,000 Virginias diagnosed with gonorrhea, chlamydia, or syphilis infection in 2013 which is an eight percent increase from 2012 (VDH, 2015). Virginia is currently ranked 28th among all states for total cases of gonorrhea and the

second most frequently reported for other STIs in the United States. (VDH, 2015). Researchers have discussed that education is critical in the prevention of STI transmission (Zhang et al., 2015).

Sexual Behaviors

Sexual behavior contributes to the increasing reports of STIs among the young adult population. According to Brant and Chavious (2014), prevention of STIs must come from the national level with the CDC and trickle down to the local schools to implement prevention practices. It is important for college students to understand the factors that predict risky sexual behavior. Risky sexual behavior is any behavior that increases the probability of negative consequences associated with sexual contact including AIDS or other STIs and unplanned pregnancy (Bryant & Chavious, 2014). Such actions often involve alcohol and drug use (Foster et al., 2013). Hazardous behaviors contribute to the increase of unplanned pregnancies, regretting the sexual encounter, guilt, reduced self-esteem, and social stigmatization (Hittner et al., 2016). Most individuals do not understand how dangerous it can be when engaged in sexual activities that increase the risk of acquiring sexually transmitted diseases and HIV (Hittner et al., 2016).

Often many college students hook up with other students. This form of behavior is a risky sexual behavior because this form of conduct usually can lead to having multiple sex partners or lack of condom use (Oswalt & Watt, 2013). This form of behavior can lead to negative physical health outcomes. Oswalt and Watt (2013) mentioned that sexual exploration among college students within the age group of 18-24 years are at a higher risk for STIs. Out of the estimated, 19 million STIs reported annually, almost half of

them are between the ages of 18-24 years (CDC, 2016b). The total number of STI cases indicated by the CDC of young adults 15-24 years (1289 cases per 100,000) is four times as much as the rates among the 10-65 years old (283 cases per 100,000) for gonorrhea and chlamydia combines (CDC, 2017). According to Oswalt and Watt (2013), research has indicated the risk for STIs in the same-sex population of men who have sex with men is higher than the risk for contracting STIs amongst those in the heterosexual population.

Studies have been conducted among college campuses to understand what factors contribute to why students hesitate to report STIs to their campus health centers or other health care facilities. A University of North Carolina at Greensboro study by Gill, Tuck, Gupta, Crowe, and Figueroa (2013) used a survey analysis to review the students' sexual behaviors. The study intended to quantify the relationship between under-reporting, STIs, and the predictors to include age, gender, and the number of sexual partners. The researchers were determined to understand why the STI incidence was so high on the University of North Carolina at Greensboro's campus (Zhang et al., 2015). According to Oswalt and Watt (2013), the majority of the studies on sexual behavior lack information on whether or not the participants' sexual orientation influenced the results. This is due to many of the studies samples being small and many of the subjects being unsure of their sexual orientation (Oswalt & Watt, 2013).

Unprotected Sex/Condom Use

The decisions to participate in sexual intercourse with or without the use of condoms influence the increased reports of STIs. Hittner et al. (2016) discussed that the prevalence of many risky sexual behaviors, including unprotected sexual intercourse,

peaks during the late teens and early 20's and half of the STI cases in the United States are of teens and young adults. College students are particularly at risk of STIs given that sizable numbers of the students participate in casual sex (Hittner et al., 2016). According to American Sexual Health Association (2016), oral sex has been common among 80% of sexually active youth and young adults between 15-24 years. The American Sexual Health Association (2016) also mentioned that oral sex carries just as much STI risks as intercourse. Many youth and young adults do not understand that an individual with an STI in their mouth or genital area can transmit the infection to the genitals and the mouth at the same time through oral sexual activities (American Sexual Health Association, 2016).

Studies continue to prove college students inconsistently use condoms while engaging in sexual intercourse. Lewis, Granato, Blayney, Lostutter, and Kilmer (2009) found that many college students reported not using condoms during sexual intercourse with multiple sex partners. Inconsistencies in condom use among college students increase their risk of acquiring STIs (Hittner et al., 2016). An American Sexual Health Association study done on college student condom use found that approximately 53% of the students did not consistently use condoms during sexual intercourse (Hittner et al., 2016).

Social Behavior

Social behavior significantly influences the rate of gonorrhea because most casual sexual encounters involve multiple sex partners or unprotected sex with strangers (Gewirtzman et al., 2011). Hittner et al. (2016) mentioned that social setting could have a

large influence on college students' sexual behaviors because they tend to find themselves in new and unknown situations such as being away from their parents, siblings, and friends. College students use the time in college to grow academically and personally, becoming independent and often getting exposed to the active party scene (Foster et al., 2013). College students have to learn to adjust to people, places, and things they are unfamiliar with, such as alcohol and drug use, private parties, bars, and roommates (Hittner et al., 2016).

Alcohol Abuse and Drug Abuse

Heavy alcohol use is also associated with risky sexual behaviors (Mair et al. 2015). Research has conducted to analyze the association between sex and alcohol consumption, but the problem has not been adequately addressed among the student population. Mair et al. (2105) found that to understand how alcohol abuse influences risky sexual behaviors more studies that focus on college students and this behavior are needed. By researching college students, public health experts can specify if drinking alcohol is contributed to the sexual behaviors of young adults (Mair et al., 2015).

There is not much attention focused on the actual social environments, including bars, clubs, parties, where students engage in heavy alcohol use (Mair et al., 2015). College parties influence students to get involved with drinking games, which is greatly associated with alcohol poisoning, sexual assault, and other sexually related consequences such as STIs, and unwanted pregnancy (Foster et al., 2013). Alcohol-related criminal behaviors such as destruction of property, underage drinking, getting arrested and harming self or others have all been found to be associated with college

students and their sexual conduct (Foster et al., 2013). A Student who participates in drinking activities believes it is the social norm on university campuses. Previous research also mentioned that stress, coping skills, and acceptance play a significant role in students' participation in behaviors such as heavy alcohol use (Foster et al., 2013).

Heavy drinking and other forms of drinking have been associated with unplanned pregnancy, sex, unprotected sex, and the number of sexual partners (Mair et al., 2015). There is a clear understanding of whether or not frequent of heavy alcohol use are related to risky sexual behavior. However, studying its effects would assist in college administrators and public health administrators to a better understanding of the association between alcohol use and sexual behaviors to help craft effective prevention strategies for STIs (Mair et al., 2015).

Health Care

Understanding what living a healthy sexual lifestyle is very important to health behavior. According to the American Sexual Health Association (2016) sexual health is the ability to embrace and enjoy our sexuality throughout our lives and understanding that sexuality is a natural part of the lifecycle and it involves more than sexual intercourse. Health behavior is the action taken in the absence of observable illness and includes primary prevention and secondary prevention (Brayant & Chavious, 2014). School based health centers were implemented into schools over 45 years ago to measure the impact of adolescents and young adults' health outcomes (Bersamin, Garbers, & Gold, 2015). Healthy sexual behaviors in Virginia local school practices are abstinence,

condom use, mutually monogamous relationships, reduced sex partners, and receiving health care and vaccinations (Bryant & Chavious, 2014).

College students can show a positive association to their sexual health by exploring one's sexual identity (Oswalt & Watt, 2013). Delaying medical care leaves room for more cases of STIs to be reported each year. The exact number of cases of STIs among college students is unknown because many students will seek outside health care. Also, the insufficiency of self-reporting contributes to the unknown cases of STIs among college students. Barth, Cook, Downs, Switzer, and Fischhoff (2002) mentioned in previous research that many college students do not understand that not seeking health care can increase disease consequences such as spreading to others and permanent damage to their sexual reproductive organs.

The HBM, suggest that a broad spectrum of individual, societal, and health system factors may influence health-seeking behaviors among college students (Barth et al., 2002). To reduce barriers to STI-related care, collegiate professionals need to increase their knowledge and attention on STI prevention at both campus and national level (Barth et al., 2002). The university health services can provide outreach on campus, stress STIs in communications with students, provide education during clinic visits, and offer screenings when students are present with other health issues to help increase health seeking behaviors among the campus (Barth et al., 2002).

Insuring STI programs include more information regarding the risk of having unprotected sex would contribute to more students understanding the importance of living a healthy sexual lifestyle. According to Barth et al. (2002) if more programs that

increase knowledge and encourage more positive attitudes towards STIs, then health system factors such as accessibility and confidentiality may prove more amenable to change than individual behavior. By addressing the societal and system behaviors, the college health professionals just might be able to reduce the barriers to STI testing, resulting in increased access and use of these essential services (Bryant & Chavious, 2014).

Summary

This literature review explained how other researchers have studied the relationship between sex education and risky sexual behaviors of college students and how the two variables affect STI incidence. This Chapter also discussed how other risk factors such as age, race, and health care were related to sexual behavior. There is little knowledge about college students and their sexual practices because of the oversight of this group (Abbott & Dalla, 2008). The limitations on what information taught about sex to students leave a large gap for students to obtain sexual health knowledge and practical interventions (Abbott & Dalla, 2008). This study assessed the association between sexual education/ other HBM components and sexual behavior. Chapter 3 will provide the information on the quantitative design and methodology used to examine the association between sex education and sexual behavior among college students in Virginia.

Chapter 3: Methodology

Introduction

The purpose of this research was to explore the relationship between student sexual education and their current sexual practices. In this chapter, I describe the research design and rationale for the study. I further discuss the methodology and include information about the population, sample size, and the sampling procedures. I also describe the recruitment, participation, and data collection methods within this chapter. A pilot study was used to test the instrument designed specifically for this study; an explanation of the relationship and purpose of the pilot study are explained in this section. A discussion of validity threats was described to understand the external and internal effects and how to minimize them. The operationalization of variables, ethical considerations, and the data management process was addressed in the final sections of this chapter.

Research Design and Rationale

This study was conducted using a quantitative, cross-sectional research approach. I used a survey analysis design to assess the relationship between sexual education (independent variable) and risky sexual behaviors (dependent variables) among current college students who attend 4-year public universities in Virginia. Demographic data (i.e., sex, age, and race/ethnicity) were considered as potential confounders to further analyze the relationship between sex education and sexual behaviors of college students. This form of research provided access to a larger, more diverse population of Virginia college students. This quantitative research design also enabled me to determine which

direction association flowed between sex education and practicing safe sex (see Frankfort-Nachmias & Nachmias, 2008, p. 133).

Mainly used in descriptive studies, surveys help to explore the aspects of a situation (Kelly, 2003). A survey design helped me generalize the data collected and test the impact of the variables while other factors are controlled (see Creswell, 2009). Survey analysis also helps establish a given sample and make assumptions about the attitude or behavior of that particular population (Creswell, 2009). The survey analysis allowed for the measurement of the students' exposure to sex education, their sexual behavior, and prevention methods to assess the incidence of STIs among the Virginia college campuses. Using a survey analysis also allowed for a rapid turnaround in data collection and the ability to identify attributes of such a large population of college students (see Creswell, 2009).

Methodology

Population

Virginia is a commonwealth state located along the eastern border of the United States with a population of 8,411,808 (U.S. Census Bureau, 2017). The study included current college students from Virginia 4-year public universities who were 18-24 years of age and agreed to participate in the study. The total number of students who were eligible to participate in this STI education study was determined by whether they attended a 4-year public university in the state of Virginia and were between the ages of 18-24. There was a total of 520,879 students enrolled in 120 Virginia public and private colleges (State Council of Higher Education for Virginia, 2017). After an evaluation of the 120 colleges

it was found that only 16 of the schools were 4-year public universities, so out of the 520,879 students enrolled it was estimated that only 170,999 were eligible to participate in the study (State Council of Higher Education for Virginia, 2017).

Sampling and Sampling Procedures

I used simple random sampling for this study. A simple random sampling technique is the process in which the probabilities of selection are equal for all the participants (Frankfort-Nachmias & Nachmias, 2008). It was appropriate to use a random sampling method because I did not have access to the population's characteristics before recruitment (Frankfort-Nachmias & Nachmias, 2008). I also generalized the results using a simple random sample (see Creswell, 2009). This study only targeted students who fit the characteristics of age, class status, sex, and those able to understand and complete the questionnaire. This study excluded all incomplete survey data, all students who were less than age 18 years and greater than 24 years, and those who were class ranked as a graduate.

Power Analysis

Power analysis is an important technique for the research design to detect an effect of a given sample size (Zhang & Gou, 2016). When using power analysis, the researcher considers the effect size to decide if the sample results support the hypothesis (Zhang & Gou, 2016). The factors examined to calculate the sample size for this study was the power of the test, the effect size, and the level of significance. The power level is the probability the null hypothesis will get rejected when it is false (Cohen, 1992). Statistical power is also based on the criteria of the significance ($\propto$), the sample size (N),

and the population effect size (Cohen, 1992). The effect size is the process of measuring the difference between two groups also known as the standardized mean group (Coe, 2002). The level of significance is the probability of rejecting a true null hypothesis (Frankfort-Nachmias & Nachmias, 2008). The significance level is also known as the alpha level ($\propto$).

The sample size of 383 students was calculated using a 2-tailed sample test measured with G*Power software. For this study, it was adequate to use a power of 80% (.80) to reject the null hypothesis as false. Using a power of 80% also reduced any Type 2 errors and ensured the statistical analysis certified a valid conclusion of the population (Cohen, 1992). The alpha level of 5% (.05) was chosen to reduce any Type 1 errors. The margin of error calculated as 50% (.5) to determine an effect size of 5% (.05).

Recruitment Procedures and Data Collection

Data were collected using a self-administered questionnaire. The participants were surveyed using an online administered survey. The study was conducted using Survey Monkey for only 30 days. Participation was voluntary with no monetary compensation provided or offered. The student participants for this research received the surveys through the email databases for each university.

The recruitment of the participants for this study was based on their enrollment in a Virginia 4-year public university. Surveys were given to all consenting college students to measure the association between previous sexual education and sexual behaviors and attitudes of the participants. The individuals willing to participate were provided the survey link through their student e-mail. The students received the e-mail and were given

the option to take part in the study or decline sharing their information. In the description of the study the statement “If you agree to participate in this survey, please continue to the survey now” served as informed consent for participation. The students who elected to help with the study were required to give informed consent before the start of the questionnaire. Once the student continued to the survey, the student was assigned a number and directed to the online questions. The assigned number was the student’s identifier from that point on during the survey process. Each participant anonymously completed the questionnaire and responses were kept confidential. The researcher advised the participants that participation was voluntary and that they could refuse to answer any questions. Completion of the survey required approximately five minutes. The questionnaire closed after the last question was answered and then the student was directed to the exit statement. The exit statement acknowledged their participation in the survey.

Pilot testing the survey helped establish the instrument’s content validity (Creswell, 2009). The survey was pilot tested using 20 students from a 4-year public university located in Norfolk, Virginia. Norfolk is the second-most populated city in the state of Virginia and the core of the Hampton Roads metropolitan area (Norfolk, 2017). The university in the pilot study currently has a total of 19,793 undergraduate students enrolled and was selected because of its proximity and the diversity of the campus. The students who were eligible to complete the pilot test were selected undergraduate students between the ages of 18-24. Twenty students from the local campus were randomly selected and asked to complete the questionnaire online and provide feedback on the

survey to address issues and the ability to make improvements to the questions (Appendix A). All feedback for the pilot test was included in the revision of the final survey.

Instrumentation and Operationalization Constructs

Survey Monkey was used to conduct the research because it allowed secure online solicitation to college students using personal media e-mail accounts. The survey was multiple-choice questionnaire (Appendix B) influenced by the NCHA, the Sexual Risk Survey (SRS), the Sexual Transmitted Disease Knowledge Questionnaire (STD-KQ), the Sexual Attitudes and Behaviors Survey and Questionnaire, the Illustrative Questionnaire for Interview-Surveys with Young People, and the Youth Risk Behavior Survey. The questionnaire was administered online through Survey Monkey to each participating student's e-mail account. The questions covered the students' knowledge, behaviors, and perceptions of sex and STIs. This study assessed the relationship between sexual education and sexual behaviors, focusing on reported STI cases among respondents. I evaluated the relationship of sex education and other indicators because each student was given a questionnaire to determine their level of STI education, their sexual behaviors, and other demographic information.

National College Health Assessment (NCHA)

The NCHA is a nationally recognized research survey that can assist in collecting precise data about students' health habits, behaviors, and perceptions (ACHA, 2016). The NCHA was designed by the ACHA in collaboration with the CDC. The NCHA was first started as a pilot study to get a picture of college students' health (ACHA, 2016). The

NCHA was redesigned in the fall of 2008 and renamed NCHA II (ACHA, 2016). The NCHA II is now used as an instrument for colleges to collect data on the health of their students. The NCHA II is used by 2- and 4-year public and private colleges in the United States. Each university uses random sampling for the administration of the NCHA II because of self-selection and generalization is not valid to all the students and schools in the United States (ACHA, 2016). The population for the pilot study was stratified by the size of the school and location. Each school randomly selected the samples using a probability proportional to the scale of the total ethical student enrollment (ACHA, 2016).

The NCHA pilot test was generalized because of the ability to evaluate the students' health by comparing the results to other surveys of the same population (ACHA, 2016). The NCHA used data sets from the CDC's 1995 National College Health Risk Behavior Survey, Harvard School of Public Health's 1999 College Alcohol Study, the U.S. Department of Justice's 2000 National College Women Sexual Victimization Study, and the ACHA's 1998, 1999 spring and fall, and spring 2000 pilot test to tests the validity and reliability of the questionnaire (ACHA, 2016). The ACHA used a triangular comparison for testing the threats to validity. The NCHA was both valid and reliable for representing the students of the sample population because it painted an analytical picture of the students' health within the United States. The participation in the NCHA II has doubled since it was first administered in the year 2000 with over 1.4 million students participated at greater than 740 colleges (ACHA, 2016).

Illustrative Questionnaire for Young People and Sexual Reproductive Health

The Illustrative Questionnaire for Interview-Surveys with Young People was designed to study the sexual and reproductive health of young people as a tool to document the knowledge, beliefs, behaviors, and outcomes of sexual experiences (Cleland, 2001). It was recommended to use the questionnaire in conjunction with another published survey to adapt the questions to the local circumstances of the sample population (Cleland, 2001). Other researchers from countries such as Kenya, India, China, Nigeria, and Tanzania have used Cleland's (2001) Illustrative Questionnaire for Interview-Surveys with Young People to help determine the outcome of reproductive health among young people. For example, in a South African study the Illustrative Questionnaire for Interview-Surveys with Young People was used to examine early sexual debut among men under the age of 15 (Harrison, Cleland, Gouws, & Frohlich, 2005). The survey analysis helped to review the risk behaviors and predict any lateral sexual risk for that population (Harrison et al., 2005). The study concluded the men in this population who experienced sex before age 15 were likely to report risk behaviors because of no condom use (Harrison et al., 2005). Because the Illustrative Questionnaire for Interview-Surveys with Young People is referenced in many studies on sexual health and behaviors, it was both valid and reliable for representing the students selected for this study.

Sexual Transmitted Disease- Knowledge Questions (STD-KQ)

The STD-KQ is a questionnaire developed to measure college students' knowledge of STIs (Jaworski & Carey, 2006). The construction of the STD-KQ included

a review of empirical precedents and worked with STD experts (Jaworski & Carey, 2006). The questionnaire was pilot tested with 50 college students and tested with 391 college students using 85 items. The pilot test helped to shorten the survey by eliminating items using item and test-level analysis. The factor analyses resulted in a two-factor model of the STD-KQ, including a cause/cure factor and a general knowledge factor (Jaworski & Carey, 2006). The revised STD-KQ now consists of 27-items to include six supplemental items added to the final questionnaire for their public health value (Jaworski & Carey, 2006).

The STD-KQ has been compared to a validated HIV knowledge survey and obtained validity using a correlation analysis (Jaworski & Carey, 2006). The HIV knowledge survey (HIV-KQ-18) is an 18-item questionnaire to assess the knowledge of HIV transmission, risk reduction, consequences of infection, and testing (Carey & Schroder, 2002). The internal consistency, stability, and high correlation of the HIV-KQ-18 established the purpose of use for comparison to confirm the validity of the STD-KQ. The correlation scores of the two questionnaires were $r = .64$, $p < .01$ using 208 participants. The reliability was measured over a period using the Pearson product-moment correlation coefficient and validated internal consistency ($\propto = .86$) and test-retest reliability ($r = .88$; Jaworski & Carey, 2006). The STD-KQ can assist researchers in identifying the insufficiency of STI knowledge and evaluate risk among college students (Jaworski & Carey, 2006).

Sexual Risk Survey (SRS)

The SRS is a survey developed by graduate students Turchik and Garske (2009) to measure the frequency of sexual risk behaviors of college students. The questionnaire was initially a dichotomous response format with 37-items and was later revised to 23-items to measure a broad range of sexual behaviors (Turchik & Garske, 2009). To reduce the original 37-items of the SRS descriptive statistics and principal components analysis with varimax rotation was used (Turchik & Garske, 2009). The revised survey eliminated 14-items based on the criteria of low numbers of responses above 0 (<10%), low-item total correlations (<.40), low commonalities (<.40), and low factor loadings (<.40) (Turchik & Garske, 2009). The revised survey helped to reduce the variability and skewness in the totals of the raw score.

The SRS was found to be multifactorial and demonstrated validity due to its relationship with psychometric properties (Turchik, Walsh, & Marcus, 2015). The SRS was validated using a sample of college students from a Midwestern university. This study expanded existing research by using a large, diverse archival data set collected from 2006-2013. The sample included 5,496 college students in 16 different American colleges (Turchik et al., 2015). The SRS scoring measure and factor structure were examined during this study to ensure the confirmatory factor analyses supported the original 5-factor solution (Turchik et al., 2015). The SRS results proved that is good internal consistency and test-retest reliability (Turchik et al., 2015). The reliability scale results were .90. The researchers used Cronbach's coefficient alpha to measure the reliability of the SRS. Turchik, Walsh, and Marcus (2015) concluded that using a large

sample size the reliability remained consistent and stable across all factors. According to Turchik and Garske (2009), the validity and reliability of SRS were established among college students. The SRS help provide researchers with a valid measure of sexual risk and is used to clarify findings within the literature that are inconsistent and support improved programs designed to prevent and reduce sexual risk behaviors among college students (Turchik & Garske, 2009).

Definition of the Variables

Dependent variable. Practicing risky sexual behaviors is the dependent variable. The risky sexual behaviors include unprotected sex and condom use, multiple sex partners, and alcohol and drug use and abuse before sexual intercourse.

Independent variable. Sexual education is the independent variable. This variable was determined based on college student's previous sexual knowledge.

Demographic variables. Age, sex, race, ethnicity, class status, sexual orientation, STI status, dating status, health care status, housing type, class status, school type, and university name are the demographic variables.

Table 3

Operational Definition of Variables

Name	Type of measurement	Definition	Variable
Sexual behaviors (Dependent)	Categorical	Have students ever encountered any form of sexual contact	4-5 point Likert scales with varying anchors
Sexual intercourse (Dependent)	Categorical	Have students ever had sexual intercourse	1= Yes 2= No
Age of first sexual intercourse (Dependent)	Categorical	The age when students had first sexual intercourse	1= 11 years old or younger 2=12 years old 3=13 years old 4=14 years old 5=15 years old 6=16 years old 7=17 years old or older
Number of sex partners (Dependent)	Categorical	Total number of sexual partners in a students' lifetime	1=1 person 2=2 people 3=3 people 4=4 people 5=5 people 6=6 or more people
Sex partners in past 3 months (Dependent)	Categorical	Students total number of sexual partners in last 3 months	1=No sex in past 3 months 2=1 person 3=2 people 4=3 people 5=4 people 6=5 people 7= 6 or more people
Sex partners in 30 days (Dependent)	Categorical	Students total number of sex partners in last 30 days	1=0 times 2=1 time 3=2 or 3 times 4=4 to 9 times 5=10 to 19 times 6=20 or more times
Condom use (Dependent)	Categorical	Have students ever used a condom during sexual intercourse	1=Never used a condom 2= Rarely use a condom 3=Sometimes used a condom 4=Most of the time used a condom 5=Always used a condom
Sexual behaviors (Dependent)	Categorical	Have students ever encountered any form of sexual contact	4-5 Point Likert Scales with varying anchors
Sexual intercourse (Dependent)	Categorical	Have students ever had sexual intercourse	1= Yes 2= No
Oral sex no condom (Dependent)	Categorical	Have students ever used a condom during oral sex	1= 0 times 2=1-2 times 3=3-4 times 4=5 or more times
Anal sex no condom (Dependent)	Categorical	Have students ever used a condom during anal sex	1= 0 times 2=1-2 times 3=3-4 times 4=5 or more times

(table continues)

Name	Type of measurement	Definition	Variable
Hooking up (Dependent)	Categorical	Have students ever went out to parties, bars, etc. just to search for sex	1= 0 times 2=1-2 times 3=3-4 times 4=5 or more times
Sex with alcohol/drugs (Dependent)	Categorical	Have students ever had sex while using alcohol or drugs	1= 0 times 2=1-2 times 3=3-4 times 4=5 or more times
Sex with new partner (Dependent)	Categorical	How often do students discuss sexual history with a new sexual partner before engaging in sex	1= 0 times 2=1-2 times 3=3-4 times 4=5 or more times
Multiple sex partners (Dependent)	Categorical	How many times have students engaged in sexual intercourse with a partner knowing they are having sex with others at the same time	1= 0 times 2=1-2 times 3=3-4 times 4=5 or more times
Sex with partner and STI diagnosis (Dependent)		Have students willingly had sexual intercourse with a partner knowing they have been diagnosed with a STI	1=Yes 2=No
Age (Confounder)	Categorical	Years of life at time of survey	1= 18 years old 2= 19 years old 3= 20 years old 4= 22 years old 5= 23 years old 6= 24 years old 7= 25 years and older
Sex (Confounder)	Categorical	Sex of student at birth	1= Male 2= Female
Race/ethnicity (Confounder)	Categorical	Reported race and ethnicity	1= White- NH 2= Black- NH 3= Hispanic or Latino 4= Asian or Pacific Islander 5= American Indian/ Alaskan Native 6= Other
Class status (Confounder)	Categorical	Year in college at time of survey	1= Freshman 2= Sophomore 3= Junior 4= Senior 5= Graduate Student 6= Other
Marital status (Confounder)	Categorical	Current marriage status at time of survey	1= Never Married 2= Married 3= Unmarried 4= Separated 5= Divorced 6= Widowed 7= Domestic Partner
STI status (Confounder)	Categorical	Diagnosed with an STI previously	0= Never had sexual contact/ intercourse 1= No 2= yes 3= unknown

Measurement and Scale of Variables

The independent and dependent variables were measured using Likert and categorical scaling methods. Likert scaling is used in research studies when attitudes of the sample population are measured (Frankfort-Nachmias & Nachmias, 2008). The independent and dependent variables for this study are ordinal level variables. The STD-KQ was used to measure the sexual knowledge (independent variable) of the sample population. The STD-KQ consist of 27-items with true, false and do not know answers. The scoring for each answer on the STD-KQ was one point for each correct answer, and zero for each do not know incorrect, or each item not answered. For example, the answer to item 1 is false, and if the participant answers the question as false, then 1 point is given for the correct answer. The highest score for the STD-KQ is 27 points with STD knowledge ranging from 0 (lowest of STD knowledge) to 27 (highest of STD knowledge). The NCHA, SRS and Illustrative Questionnaire for Interview-Surveys with Young People were used to measure the sexual behaviors (dependent variable). The SRS consist of 23 items with dichotomous response format divided into five ordinal categories of 0 to 4. The code "0" will represent all the answers of zero for the question of the number of partners or the number of times they have engaged in a risky sexual behavior. For example, item 8 ask the total number of partners the participant had sex with will score as 1 = 2 partners; 2 = 3-4 partners; 3 = 5-9 partners; and 4 => 10 partners. All questions about the number of times participants engaged in any risky behavior will be coded as 1 = 1-3 times, 2 = 4-14 times, 3 = 15-50 times, and 4 => 51 times. The scoring used in this study for the SRS was the same coding used in the original survey.

Data Analysis Plan

The data collected was entered into Excel format and analyzed. Statistical Package for Social Sciences (SPSS) version 24.0 was used to analyze the data gathered from the participants in this study. The data cleaning process was conducted before the analysis to prevent any coding deviations. According to Frankfort-Nachmias and Nachmias (2008), data cleaning is the proofreading of data to catch and correct errors and inconsistent codes. To clean the data, I screened the data for accuracy, any missing data, omissions, wild codes, and outliers. To ensure the data was internally consistent. The data cleaning process was completed using a frequency distribution for each variable. All surveys with missing data or incomplete data was excluded from this study.

Descriptive statistics was calculated to analyze the data. According to Frankfort-Nachmias and Nachmias (2008), descriptive statistics is a tool to allow for researchers to summarize and organize data in an effective and meaningful way. It also provides the tools for the scientist to analyze, represent, and interpret relationships between variables (Frankfort-Nachmias & Nachmias, 2008). Descriptive statistics allow researchers to develop explanations of complex social phenomena that deal with relationships of variables (Frankfort-Nachmias & Nachmias, 2008). I used descriptive statistics to analyze frequencies and confidence intervals of each indicator. Cross tabs were calculated between the dependent variable and the independent variable to explore the distribution of the independent variable by the dependent variable (Frankfort-Nachmias & Nachmias, 2008).

Multivariate logistic regression was used to explore the relationship between sexual education history and of current sexual behavior while adjusting for all other potential confounders. Association was calculated using alpha values, confidence intervals, and correlation coefficients (r). Odds Ratios (OR) measured the association between exposure to sexual education (independent variable) and the outcome of sexual behavior (dependent variable). I calculated the OR using a frequency table with a *.95* confidence interval (CI). The critical *P* value significance was set to *.05* to measure whether the relationship between sexual education and sexual behaviors were statistically significant. The findings from this study were used to highlight the discrepancy in sexual knowledge among college students and the importance of continuing a sexual education course throughout college to help prevent risky sexual behavior which can lead to the increase of STIs.

Threats to Validity

Validity is the extent to which an instrument measures what it was intended to measure (Frankfort-Nachmias & Nachmias, 2008). In quantitative research, validity is the attribute of whether the researcher can generate meaningful and useful inferences from the scores on instruments (Creswell, 2009). Validity can experience threats. There are two types of validity threats, internal and external. Internal threats are related to procedures, treatments, or experiences from the participants that can prevent or limit the researcher's ability to create valid inferences from the data collected from the sample population (Creswell, 2009). External threats are incorrect inferences drawn by the researcher from the sample data. For example, external validity could arise from the

researcher generalize beyond the sample population for the study to other racial or social groups not included in the survey's population (Creswell, 2009).

The datasets and instruments that the researcher used for this study have been validated with past research, although there were still some threats to internal validity for this study. For example, sampling validity may be present due to the sample population may not represent the entire population of college students in the United States. Sampling techniques can influence threats to internal validity by participants can be selected according to their characteristics which can predispose them to have certain outcomes, such as being smarter (Creswell, 2009). This study used a random sampling technique to select the participants so that the characteristics have the probability of being equally distributed (Creswell, 2009). There was no evidence of any threats to external validity because the researcher will not generalize beyond the groups of the sample population to any other groups Creswell, 2009). The researcher revalidated the data using the preloaded rules in SPSS to minimize any threats to validity.

Ethical Considerations

This study used primary and secondary data. Permissions were not necessary from each university to recruit students currently enrolled in their school using the universities public directory because the directory is of public domain and open to the public for use. A letter of invitation for the pilot study and final study was sent to each student requesting them to participate in the study using the students' public email database. Each letter sent to the students included a statement of confidentiality for all responses to the study's survey. Additionally, once each participant agreed to the survey and

confidentiality was reiterated at the start of the online questionnaire on the electronic informed consent form. The informed consent form included the information regarding the study, the research nature and purpose, and contact information.

The primary data was obtained from the survey developed by the researcher. The instrument selected by the researcher was selected and introduced specifically for this study. The participants were randomly recruited using an online survey development cloud-based software known as SurveyMonkey. The online survey software is covered by the Health Insurance Portability and Accountability Act of 1996 and regulate all protected information collected through surveys administered through its software. Using this software allowed the participants to answer the questionnaire confidentially. The secondary data was obtained from the VDH; the Sexuality Information and Education Council of the United States; the CDCs' Behavioral Risk Factor Surveillance System, National College Health Risk Behavior Survey, Global School-Based Student Health Survey, National Survey of Family Growth; and the ACHAs' NCHA. The participants and universities for this study was granted anonymity and confidentiality. The secondary data collected was not a threat of violating any of the participants' rights. The researcher randomly administered the surveys. The surveys were completed anonymously by the participants allowing the threat for any breach of confidentiality to be reduced. The study did not include any of the students' personal information on any of the survey questions or answers to ensure confidentiality. There was no prior relationship between the researcher and the selected students or universities. I used the collected data from both

primary and secondary sources to answer the research questions and prove the hypothesis in this study.

The data used in this research study will be kept confidential on the researchers' password protected computers' hard drive for a maximum of five years. I am the only individual who has access to the data and password. After the five-year period, all stored data will get destroyed. All data was analyzed and presented in chapter 4 of this study.

Summary

This study used a quantitative cross-sectional survey analysis to assess the relationship between sexual education and risky sexual behaviors among current college students who attend universities in Virginia. Using survey analysis to conduct this research provided access to a larger, more diverse population of Virginia college students. The survey analysis also allowed for the measurement of the student's exposure to sex education, their sexual behavior, and prevention methods to assess the incidence of STIs among the Virginia college campuses.

In this section, the rationale of the study and methodology was explained. The study population included undergraduate students from colleges in the state of Virginia. The sampling procedures were also discussed. To select the sample population, I used a simple random sampling technique. Data collection, recruitment procedures, instrumentation, and operationalization constructs were clearly described in this chapter. Also, the threats to validity and ethical considerations and procedures were also discussed in this section.

Chapters 4 and 5 will present and interpret the results and findings of the descriptive statistical analysis techniques. Linear regression, multiple regression, chi-square test, and MANOVA were used to determine the relationship between sexual education and risky sexual behavior of college students currently enrolled at a Virginia university.

Chapter 4: Results

Introduction

The purpose of this quantitative research study was to measure the relationship between student exposure to sexual education and their risky sexual behaviors. Many factors, including alcohol and drug use, unprotected sex and condom use, health care, and social setting were explored to analyze whether there were any relationships with how and why college students remain among the age group that is highest in STI incidence. This study was conducted using a quantitative cross-sectional survey analysis to assess the relationship between sex education and risky sexual behaviors among current college students who attend universities in Virginia. Multinomial logistics regression analysis was used to analyze the independent and dependent variables and other factors to determine if the relationship between the variables was statistically significant.

Research Questions

Research Question 1: What is the relationship between sexual education and participation in risky sexual behaviors (unprotected sex, multiple sex partners, condom use, and drug and alcohol use and abuse) among college students attending universities in Virginia?

$H_0$1: There is no relationship between sexual education and participation in risky sexual behaviors among college student attending universities in Virginia.

H_a1: There is a relationship between sexual education and participation in risky sexual behaviors among college student attending universities in Virginia.

Research Question 2: What is the relationship between having a sexual education program and being diagnosed with an STI among college-aged students in Virginia, adjusting for potential confounders?

$H_0$2: There is no relationship between having a sexual education program and being diagnosed with an STI among college-aged students in Virginia, adjusting for potential confounders.

H_a2: There is a relationship between having a sexual education program and being diagnosed with an STI among college-aged students in Virginia, adjusting for potential confounders.

Research Question 3: Controlling for all other potential risk, what is the association between student participation in risky sexual behaviors and race among college-aged students in Virginia?

$H_0$3: There is no association between student participation in risky sexual behaviors and race among college-aged students in Virginia.

H_a3: There is an association between student participation in risky sexual behaviors and race among college-aged students in Virginia.

Research Question 4: What are the students who attend a university in Virginia perceptions about having a sexual education course added to their college curriculum to help prevent them from contracting STIs?

$H_0$4: The students who are attending a university in Virginia will believe that including a sexual education course in the curriculum will help prevent them from contracting STIs.

H_a4: The students who are attending a university in Virginia will not believe that including a sexual education course in the curriculum will help prevent them from contracting STIs.

Research Question 5: What are the college-age students in Virginia perceptions about the chances of contracting an STI if they do not use a condom during sexual intercourse?

H_05: The college-age students in Virginia believe that they will have a chance of contracting an STI if they do not use a condom during sexual intercourse.

H_a5: The college-age students in Virginia believe that they will not have a chance of contracting an STI if they do not use a condom during sexual intercourse.

The results from the data collection and analysis will be presented in this chapter. The data collection process and the discrepancies that were found in the data collection is also discussed in this chapter. The results are also discussed in this chapter followed by the summary.

Pilot Study

A pilot study was conducted before the final study from February 28 to March 16 for a total of 17 days to determine if the proposed survey instrument was appropriate for the research study. The participants for the pilot study were randomly selected using an e-mail invitation to participate in the pilot test through the online survey database SurveyMonkey. An invitation e-mail was sent to 62 random participants, and there were 20 completed responses, one incomplete response, 32 bounced e-mails, six ineligible respondents, and three opted out of the survey.

A final total of 20 participants were recruited and asked to respond to 28 survey questions (26 multiple-choice and two open-ended questions) regarding their sexual education and sexual behavior. The purpose of the pretest was to identify any potential problems with the structured survey instrument. The multiple-choice questions consisted of the sexual education and sexual behavior questions developed to answer the proposed research questions and hypothesis (Appendix A). The two open-ended questions were at the end of the survey to ask the subsample of 20 participants if any of the questions were inappropriate, irrelevant and if any wording or vocabulary would affect the integrity of the survey instrument.

The pilot survey provided the subsample the opportunity to highlight any part of the survey that would compromise the purpose of the instrument to me before administering the final study. The respondents were able to openly express their concerns, suggestions, and questions in the two open-ended questions provided at the end of the pilot survey. The feedback received from the pilot study did not include any significant concerns or questions. However, the feedback did include suggestions to change the stated completion time of the survey and the gender classification (Survey Question 2). The gender classification suggestion was to add a third option such as "Other" for respondents who identify as transgender, and the completion time suggestion was to change the estimated completion time from 30 minutes to 5 minutes because it only took each respondent a total of 3 minutes or less to complete the survey. Moreover, the respondents also mentioned that the 30-minute completion time was discouraging. After reviewing all the feedback, I determined it was appropriate to add the additional

option (Other) to the gender classification (Question 2) of the final survey and change the estimated completion time to five minutes. The pilot survey had a 95% response rate and helped determine that the final survey instrument was appropriate for the research study and did not require any significant changes to the overall structure.

Data Collection

Data collection for this research study was conducted using SurveyMonkey for 16 days. There were 1,177 total responses with 656 completed surveys. The response rate was calculated at 55.7%. Out of the 1,177 responses, 473 (40.2) responses were ineligible due to either answering the age question as 25 years of age or older or the class status question as a graduate, and 48 (4.1) responses were deleted due to incompleteness. Recruitment was done using the public directories from the Virginia universities that had public e-mail directories. E-mail invitations were sent to each student who had a student e-mail address listed in the school's public directory. Each student received a participation invitation via e-mail, which included the informed consent form and the research survey instrument (Appendix B). There were no inconsistencies in the data collection between what was proposed in Chapter 3 and the actual data collection procedures.

The sample population consisted of 656 student current college students enrolled in Virginia universities who completed the survey instrument. The students were between the ages of 18-24. There was a total of 212 (32.3%) males and 442 (67.4%) females. The final sample included 380 (57.9%) of White students and 190 (29%) of Black or African American students. There were 169 (25.8%) out of the 659 student participants who

responded as a freshman, and 590 (89.9%) responded as never married. In summary, there was a total of 513 (78.2%) of the sample population (N = 656) responded that they had engaged in sexual intercourse.

Data Cleaning

The data were entered into IBM SPSS 24.1 to be analyzed. The data were then screened for any missing data and outliers using a frequency distribution procedure. While screening the data, it was found that 48 participants did not complete the required questions to be included in the study. Screening the data reduced the responses from 705 to 656 completed surveys. After screening the data, the variables were recoded to combine variables with low response rates. Table 4 presents the recoded variables. The data were then reviewed to ensure it was coded correctly.

Table 4

List of Recoded Variables

	Variable	
Dependent Variables	Original variable	Recoded variable
Age of first sexual intercourse		
	1 = 11 years old or younger 2 = 12 years old 3 = 13 years old 4 = 14 years old 5 = 15 years old 6 = 16 years old 7 = 17 years old or older	1 = 13 years old or younger 2 = 14- 16 years old 3 = 17 years old or older
Number of sex partners		
	1 = 1 person 2 = 2 people 3 = 3 people 4 = 4 people 5 = 5 people 6 = 6 or more people	1 = 1 person 2 = 2-4 people 3 = 5 or more people
Sex partners in past 3 months		
	1 = No sex in past 3 months 2 = 1 person 3 = 2 people 4 = 3 people 5 = 4 people 6 = 5 people 7 = 6 or more people	1 = No sex in past 3 months 2 = 1 person 3 = 2 or more people
Sex partners in 30 days		
	1 = 0 times 2 = 1 time 3 = 2 or 3 times 4 = 4 to 9 times 5 = 10 to 19 times 6 = 20 or more times	1 = 0- 3 times 2 = 4 to 9 times 3 = 10 or more times
Condom use		
	1 = Never used a condom 2 = Rarely use a condom 3 = Sometimes used a condom 4 = Most of the time used a condom 5 = Always used a condom	1 = Never used a condom 2 = Sometimes used a condom 3 = Always used a condom
Oral sex no condom		
	1 = 0 times 2 = 1-2 times 3 = 3-4 times 4 = 5 or more times	1 = 0 times 2 = 1-4 times 3 = 5 or more times
Anal sex no condom		
	1 = 0 times 2 = 1-2 times 3 = 3-4 times 4 = 5 or more times	1 = 0 times 2 = 1-4 times 3 = 5 or more times

(table continues)

	Variable	
Dependent Variables	Original variable	Recoded variable
Hooking up		
	1 = 0 times	1 = 0 times
	2 = 1-2 times	2 = 1-4 times
	3 = 3-4 times	3 = 5 or more times
	4 = 5 or more times	
Sex with alcohol/drugs		
	1 = 0 times	1 = 0 times
	2 = 1-2 times	2 = 1-4 times
	3 = 3-4 times	3 = 5 or more times
	4 = 5 or more times	
Sex with new partner		
	1 = 0 times	1 = 0 times
	2 = 1-2 times	2 = 1-4 times
	3 = 3-4 times	3 = 5 or more times
	4 = 5 or more times	
Multiple sex partners		
	1 = 0 times	1 = 0 times
	2 = 1-2 times	2 = 1-4 times
	3 = 3-4 times	3 = 5 or more times
	4 = 5 or more times	
Sexual orientation		
	1 = Heterosexual	1 = Heterosexual
	2 = Gay/Lesbian	2 = Gay/Lesbian/Bisexual
	3 = Bisexual	3 = Not Sure
	4 = Not Sure	
Independent Variable		
STI diagnosis with no condom use		
	1 = Very likely	1 = Very likely
	2 = Very certain to likely get one	2 = Likely
	3 = Likely	3 = Unlikely
	4 = Unlikely	
	5 = Impossible	
Demographic Variables		
Age		
	1 = 18 years of age	1 = 18 - 19 years of age
	2 = 19 years of age	2 = 20- 21 years of age
	3 = 20 years of age	3 = 22-24 years of age
	4 = 21 years of age	
	5 = 22 years of age	
	6 = 23 years of age	
	7 = 24 years of age	
Race		
	1 = White	1 = White
	2 = Black/African American	2 = Black/African American
	3 = Asian	3 = Other
	4 = Hispanic/Latino	
	5 = American Indian/Alaska Native	
	6 = Native Hawaiian/Pacific Islander	
Class status		
	1 = Freshmen	1 = Freshmen
	2 = Sophomore	2 = Sophomore
	3 = Junior	3 = Junior
	4 = Senior	4 = Senior
	5 = Other	

(table continues)

	Variable	
Demographic Variables	Original Variable	Recoded Variable
Marital status		
	1 = Never married 2 = Married 3 = Unmarried 4 = Separated 5 = Divorced 6 = Widowed 7 = Domestic Partner	1 = Never married 2 = Married 3 = Other

Results

Descriptive Statistics

The demographic variables used in this study were age, sex, race and ethnicity, class status, marital status, and sexual orientation. Descriptive analysis was used to calculate the frequencies of the sample's demographics (see Table 5). A total of 705 surveys met the eligibility requirements for the study, with 656 (93.2%) complete, and 48 (6.8%) incomplete. Of the 656 participants who completed the survey, 442 (67.4%) were female, and 212 (32.3%) were male. There were 380 (57.9%) White participants. The data were closely distributed by class with 169 (25.8%) freshman and 168 (25.6%) juniors.

Table 5

Descriptive Statistics of All Demographic Variables

Characteristics	*N* (%)
Age	
18-19 years of age	241 (36.7)
20-21 years of age	226 (34.5)
22-24 years of age	189 (28.8)
Sex	
Male	212 (32.3)
Female	442 (67.4)
Other	2 (0.3)
Race	
White	380 (57.9)
Black/African American	190 (29.0)
Other	86 (13.1)
Class status	
Freshmen	169 (25.8)
Sophomore	135 (20.6)
Junior	168 (25.6)
Senior	184 (28.0)
Marital status	
Never married	590 (89.9)
Married	31 (4.7)
Other	35 (5.3)
Sexual orientation	
Heterosexual	530 (80.8)
Gay/Lesbian/Bisexual	110 (16.8)
Not Sure	16 (2.4)

Sexual Behavior Risk

The sexual behavior variable (dependent) was compromised of the sexual risk questions. The variable includes sexual intercourse, age of first sexual intercourse, number of sex partners in lifetime, sex partners in past three months, condom use, oral sex without condom, anal sex without condom, random hooking up, sex while using alcohol and drugs, sex with new partner without prior history, sex with a partner with a known STI diagnosis, and sex with a partner who has multiple sex partners. Table 6 presents the descriptive analysis of the sexual behavior risk variables.

Within the sample, 513 (78.2%) participants reported that they had sexual intercourse, where 143 (21.8%) responded to never having sexual intercourse. The 143 who answered "No" to sexual intercourse were not asked any of the 15 sexual behavior questions, and their responses defaulted to "Not Applicable." Nearly half (48.1%) of the respondents reported first participating in sexual intercourse at the age of 17 or older. Two-thirds (62.2%) reported to having sexual intercourse with only one partner in the past 3 months.

Of the participants who responded as having had sexual intercourse 261 (50.9%) responded they had sexual intercourse an average of "0 to 3 times" in the past 30 days. Almost one-third of the participants (29.8%) reported that they had never used a condom. A total of 406 (79.1%) students responded that they had engaged in oral sex without the use of a condom five or more times. Almost three-fourths (71.93%) of the participants responded they had not had anal sex without the use of a condom.

A total of 366 (71.3%) of the students who reported ever having sexual intercourse responded that they have never gone out to any bars or parties with the intentions of “hooking up.” One-third (33.9%) of the students who reported that they engaged in sexual intercourse while using alcohol or drugs “five or more times.” Almost half (46.0%) responded they have never engaged in sexual intercourse with a new partner before discussing the partners’ sexual history. When asked if they had ever had sex with a partner knowingly diagnosed with an STI, 76.5% responded, “no.” A total of 290 (56.5%) participants responded that they had never engaged in sexual intercourse with a partner who is knowingly having sex with other partners.

Table 6

Descriptive Statistics of All Sexual Behavior Risk Factors (n = 656)

Characteristics	*N* (%)
Sexual intercourse	
Yes	513 (78.2)
No	143 (21.8)
Age of first sexual intercourse	
13 years old or younger	30 (5.8)
14-16 years old	236 (46.0)
17 years old or older	247 (48.1)
Number of sex partners in a lifetime	
1 person	119 (23.2)
2-4 people	175 (34.1)
5 or more people	219 (42.7)
Sex partners in past 3 months	
No sex in past 3 months	87 (17.0)
1 person	319 (62.2)
2 or more people	107 (20.9)
Sexual intercourse in 30 days	
0-3 times	261 (50.9)
4 to 9 times	131 (25.5)
10 or more times	121 (23.6)
Condom use	
Never used a condom	153 (29.8)
Sometimes used a condom	245 (47.8)
Always used a condom	115 (22.4)
Oral sex no condom	
0 times	31 (6.0)
1-4 times	76 (14.8)
5 or more times	406 (79.1)
Anal sex no condom	
0 times	369 (71.9)
1-4 times	100 (19.5)
5 or more times	44 (8.6)
Hooking up	
0 times	366 (71.3)
1-4 times	91 (17.7)
5 or more times	56 (10.9)
Sex with alcohol/drugs	
0 times	136 (26.5)
1-4 times	203 (39.6)
5 or more times	174 (33.9)

(table continues)

Characteristics	*N* (%)
Sex with new partner before discussing sexual history in your lifetime	
0 times	236 (46.0)
1-4 times	193 (37.6)
5 or more times	84 (16.4)
Sex with partner who had an STI diagnosis	
Yes	11 (2.1)
No	502 (97.9)
Multiple sex partners	
0 times	290 (56.5)
1-4 times	188 (36.6)
5 or more times	35 (6.8)

STI Risk

A descriptive analysis was performed on the STI variables, which was compromised of STI testing, STI diagnosis, HIV/AIDS testing, and STI diagnosis with no condom use (see Table 7). Participants were asked questions related to their STI status and knowledge, and out of the 656 student participants, 513 were asked if they have ever been tested for STIs. Nearly two-thirds (60.2%) of the 513 respondents answered “yes” they have been tested for STIs before. The remaining participants of the sample population 143 participants were not asked this question because they responded “No” to ever having sexual intercourse. The STI risk questions were not applicable to those who had never had sexual intercourse. Within this same population of students 10.1% reported that they had been diagnosed with an STI at least once. There were equal respondents 215 (41.9%) to the answers “yes or no” that they had been tested for HIV/AIDS before. All 656 participants qualified for the question “how likely they felt they were to contract an STI if they did not use a condom during sexual intercourse.” A quarter (25.3%) of the sample responded that they would “very likely,” get an STI with no condom use.

Table 7

Descriptive Statistics of All STI Risk Variables (n = 656)

Characteristics	*N* (%)
STI testing	
Yes	309 (60.2)
No	204 (39.8)
STI diagnosis	
Yes	66 (12.9)
No	447 (87.1)
HIV/AIDS testing	
Yes	215 (41.9)
No	215 (41.9)
Not sure	83 (16.2)
STI diagnosis with no condom use	
Impossible	64 (9.8)
Unlikely	200 (30.5)
Likely	226 (34.5)
Very likely	166 (25.3)

Sexual Education

The sexual education variable (independent) was arranged into three different domains to include STI education before attending college, STI education in any college classes, and should sexual education be added to the college curriculum. A descriptive analysis was conducted to determine the frequencies of the sample. Table 8 presents the results of the descriptive analysis performed on all the sexual education variables.

The 656 participants were all asked, “if they received any form of STI education before attending college” and 92.5% reported that they had been educated on STIs before attending college. A little over half (67.7%) of the participants reported that they had not

been taught about STIs in any of their college classes. Over half (57.8%) of the students responded that they believed sexual education should be added to the college curriculum.

Table 8

Descriptive Statistics of All Sexual Education Variables (n = 656)

Characteristics	*N* (%)
STI education prior to attending college	
Yes	607 (92.5)
No	42 (6.4)
Not sure	7 (1.1)
STI education in any college classes	
Yes	190 (29.0)
No	444 (67.7)
Not sure	22 (3.4)
Should sexual education be added to the college curriculum	
Yes	379 (57.8)
No	150 (22.9)
Not sure	127 (19.4)

The sample was an appropriate representative of the population of the college students who attend Virginia universities because a simple random sampling technique was used to conduct the study. The recruitment procedures allowed for all students who attended a Virginia university the opportunity to be included in the study. Each student who had a public e-mail address (N = 37,108) was e-mailed an invitation to take part in the research study through SurveyMonkey. The researcher used SurveyMonkey to apply the random sampling technique which allowed for an equal and known probability of each student to be included in the study (Frankfort-Nachmias & Nachmias, 2008).

The results were generalized because the researcher did not have access to the population's overall characteristics. A total of 1,177 students responded to the survey in the 30-day time frame. The sample was then cleaned for any incomplete and ineligible surveys given a total sample of 656 surveys eligible for the study. This sample size was 273 participants more than what was required for a 2-tailed sample test with the use of a power of .80 and an effect size of .05. This sample was more than the calculated sample size of 383 students and also half (.5%) of the total responses received. Therefore, this sample was a certified and valid representation of the population.

Multinomial Logistic Regression Analysis

In this section, I described the statistical results obtained. Two statistical analysis was used to test the relationship between sexual education (independent variable) and sexual behaviors (dependent variable). Chi-square test of association and multinomial logistic regression were used to test the research questions and the hypotheses. The results for the chi-square analysis and multinomial logistic regression analysis are summarized in Tables 9 through 21 and Tables C1 through C14 (see Appendix C).

I first ran a descriptive analysis of the sample used for each model to construct frequency distributions to examine the response pattern of the variables (Frankfort-Nachmias & Nachmias, 2008). Chi-square test of association was then conducted to evaluate the difference between the observed frequencies and the expected frequencies I assumed were statistically significant (Frankfort-Nachmias & Nachmias, 2008). Chi-square test is a non-parametric test of significance used to test the association between the

independence of the variables when there is data collected from naturalistic samples (Gerstman, 2008).

Multinomial logistic regression modeling was further conducted to examine the relationship between previous exposure to sexual education and sexual behaviors of the participants. The five research questions and hypotheses were examined using multinomial logistic regression. Separate multinomial logistic models were conducted to calculate the adjusted odds ratios and the confidence intervals (CI) for both the sexual education variables and the sexual behavior variables which included the factors of STI risk, race, and the students' perception of including sexual education into the college curriculum. The multinomial logistic analysis results for the research questions and hypotheses are presented in this section.

Research question 1. Research Question 1 was "What is the relationship between to sexual education and participation in risky sexual behaviors among college students attending universities in Virginia?" To examine the relationship between to sexual education and participation in risky sexual behaviors a chi-square test and multinomial logistic regression were performed. Table C1 displays the descriptive outcome statistics for the model including the frequency distribution (n%) and confidence interval (CI). The sample included 607 (92.5%) students who received sex education before attending college and 42 (6.4%) who did not. Those students who reported receiving sex education during college were 190 (29%) of the sample compared to those 444 (67.7%) who did not receive sex education during college.

Chi-square tests of association were conducted between the variables to determine if there is a significant relationship between the independent variable and the outcome variables. The results of the chi-square test between prior sexual education and the sexual behavior variables did not show a statically significant relationship between sexual education and 90% of the sexual behavior variables (see Table 9). Sexual intercourse was significant with a p-value, $p < .000$; and the variable partner diagnosed with STI had a p-value of, $p < .002$.

Table 9

Chi-square Test of Sexual Education Before College by Sexual Behaviors (n = 656)

Characteristics	χ^2	Sig.	df
Age	3.732	0.444	4
Sex	1.887	0.389	2
Race	1.002	0.909	4
Class status	1.397	0.966	6
Marital status	2.651	0.618	4
Sexual orientation	4.029	0.133	2
Sexual intercourse	17.293	0.000***	2
Age of first sexual intercourse	0.737	0.947	4
Number of sex partners	2.497	0.645	4
Sex partners in past 3 months	0.749	0.945	4
Sexual intercourse in 30 days	4.489	0.344	4
Condom use	4.198	0.38	4
Oral sex no condom	3.598	0.463	4
Anal sex no condom	2.112	0.715	4
Hooking up	2.705	0.608	4
Sex with alcohol/drugs	2.538	0.638	4
Sex with new partner	3.971	0.41	4
Sex with partner and STI diagnosis	12.907	0.002**	4
Multiple sex partners	2.992	0.559	4

Note. *$p < .05$ **$p < .01$ ***$p < .0001$

A chi-square test of association was conducted to examine the relationship between sexual education in college classes and the sexual behavior variables. The results

from the chi-square tests are summarized in Table 10. The chi-square test showed that there was not a statistically significant relationship between sexual education in college classes and the sexual behavior variables. There was a significant relationship between the demographic variables age and class status and the independent variable sexual education during college $p < .000$.

Table 10

Chi-square Test of Sexual Education During College by Sexual Behaviors (n = 656)

Characteristics	χ^2	Sig.	df
Age	17.173	0.002**	4
Sex	0.238	0.888	2
Race	4.605	0.33	4
Class status	24.178	0.000***	6
Marital status	3.476	0.482	4
Sexual orientation	2.033	0.362	2
Sexual intercourse	3.262	0.196	2
Age of first sexual intercourse	6.083	0.193	4
Number of sex partners	1.075	0.898	4
Sex partners in past 3 months	5.732	0.22	4
Sexual intercourse in 30 days	8.182	0.085	4
Condom use	8.751	0.068	4
Oral sex no condom	7.006	0.136	4
Anal sex no condom	4.603	0.33	4
Hooking up	6.41	0.171	4
Sex with alcohol/drugs	5.634	0.228	4
Sex with new partner	1.422	0.84	4
Sex with partner and STI diagnosis	5.755	0.056	2
Multiple sex partners	7.841	0.98	4

Note. $*p < .05$ $**p < .01$ $***p < .0001$

A multinomial logistic regression analysis was conducted to analyze the association between receiving sexual education prior to college and current sexual behavior. I conducted regression models for each of the 13 sexual behavior variables. The summarized results (adjusted odds ratio (OR) and the CI) of the multinomial logistic analyses are presented in Tables C2 through C7. The relationship between sexual

education prior to college and sexual behaviors was statistically significant (p = .002). There were 607 (92.5%) students of the sample population (n = 656) to respond that they had some form of sexual education prior to attending college and 42 (6.4%) students responded that they had not received any form of sexual education prior to attending college. It was found that those who had received some form of sexual education prior to college 486 (80.1%) responded that they had engaged in sexual intercourse. The results also indicated that the students who were sexually active and had some form of sexual education prior to college are less likely to engage in risky sexual behaviors as presented. Therefore, there was significant evidence to accept the null hypothesis when determining that if a student between the ages of 18- 24 had some form of sexual education prior to college, they would be less likely to engage in risky sexual behaviors.

The regression model for sexual intercourse and sexual education prior to college was statistically significant (p = .001). Females students who received sexual education prior to college were 6.5 times more likely to engage in sexual intercourse compared to the male students. The results indicated the model statistically significantly predicts a relationship between sexual education prior to college and age of first sexual intercourse (p = .016). Students who received sexual education prior to college were 7 times more likely to engage in their first sexual intercourse at the age of 17 years. Female students were also 4 times more likely to engage in their first sexual intercourse experience by the age of 17 years old compared to the males. Results for sexual education prior to college and number of sex partners in lifetime revealed the full model was statistically significant (p = .009). The results also showed that students ages 18-24 years who had a previous

sexual education were 7 times more likely to engage in sexual intercourse with more than five persons in a lifetime. The results are summarized in Table C2.

The results for the multinomial regression analysis for sexual education, number of sex partners in the past 30 days, and the number of times the student had sexual intercourse in the past three months (see Table C3). The model for sexual education prior to college and the number of sex partners in the past three months showed that the model was statistically significant (p = .014). Females were 3.5 times more likely to have sexual intercourse with only one person in the past three months compared to male students. Students who received sexual education before college were 4.9 times more likely to have sex with only one person in the past three months (p = .065). Sexual education prior to college and the number of times the student had sexual intercourse in the last 30 days was statistically significant (p = .003). Students who had received sexual education prior to college were 7.3 times more likely to have sexual intercourse 10 or more times in the last 30 days.

The model for the variables sexual education prior to college and condom use was statistically significant (p = .004). Students who had sex education before college were 4.7 times more likely to never use condoms during sexual intercourse than those who did not have any form of sex education prior to college. The relationship between sexual education prior to college and oral sex with no condom model was statistically significant (p = .005). The results indicated that students who had sexual education prior to college were 4.3 times more likely to have oral sex five or more times without the use of a

condom compared to those who did not have a sexual education. The results are summarized in Table C4.

The logistic regression model for sexual education prior to college and anal sex without the use of a condom was statistically significant (p = .010). The results are summarized in Table C5. It was indicated that students who are 18-19 years old were 1.2 times more likely not to use a condom during anal sex 5 or more times (p = .241). Student respondents who received sexual education before college were 5.8 times more likely to not engage in anal sex without the use of a condom than those who did not receive sexual education before college (p = .044). Results for sexual education prior to college and hooking up showed that the model was statistically significant (p = .006). Students who had prior sexual education were 5.7 times more likely to not go out to bars to hook up for sexual intercourse than those who did not have sexual education. The students who had sexual education during college were 4.2 times more likely to randomly hook up for sex compared to those who have not had sexual education during college.

The multinomial logistic regression model for sexual education prior to college and sex with the use of alcohol and drugs was statistically significant (p = .008). Students who received sexual education prior to college were 6.3 times more likely to have a sexual encounter 1-4 times with the use of alcohol and drugs than students who have not had sexual education prior to college. Freshman students were also 4.2 times more likely to not use alcohol or drugs during sexual intercourse (p = .000). The results of the logistic regression model for sexual education prior to college and sex with a new partner without discussing the partner's sexual history was statistically significant (p = .003). The

researcher revealed that students who had sexual education during college were 2.8 times more likely to have sexual intercourse 1-4 times without discussing the partner's sexual history than those who did not have any sexual education during college. All results are summarized in Table C6.

The multinomial logistic regression that explored the relationship between sexual education prior to college and sex with a partner diagnosed with an STI was found to be statistically significant (p = .000). The students who responded that they had sexual education prior to college were 5.3 times more likely not to have sexual intercourse with a partner who they knowingly were diagnosed with an STI than the students who have not had sexual education prior to college. The results of the multinomial regression model for sexual education prior to college and sex with a partner who has sex with others during the same time was statistically significant (p = .006). The students who received sexual education prior to college were 6 times more likely to have had sex 1 to 4 times in their lifetime with a partner who has had sexual intercourse with other people during the same time frame. Females were 7 times more likely to not have sex with a partner who is having sex with other people during the same time frame compared to males. Results are presented in Table C7.

Research question 2. Research Question 2 was "What is the relationship between having asexual education program and being diagnosed with an STI among college-aged students in Virginia, adjusting for potential confounders?" To examine the relationship between college-aged students having sexual education and being diagnosed with an STI, a chi-square test, and multinomial logistic regression analysis was conducted between the

two variables. Table 11 displays the descriptive outcome for the variables sexual education and STI diagnosis model including the frequency distribution (n%) and confidence interval (CI). The sample included 66 (12.9%) respondents who had been diagnosed with an STI and 447 (87.1%) who had not been diagnosed with an STI.

Table 11

Descriptive Statistics of All Sexual Education Variables by STI Diagnosis (n = 656)

	STI Diagnosis			
	Yes		No	
	n (%)	95% CI	n (%)	95% CI
Characteristics	66 (12.9)	10.0-15.8	447 (87.1)	84.2-90.0
Sex ed prior to college				
Yes	62 (12.8)	10.2-15.4	424 (87.2)	84.6-89.8
No	4 (14.8)	12.1-17.5	23 (85.2)	82.5-87.9
Sex ed during college				
Yes	18 (11.5)	9.1-13.9	139 (88.5)	86.1-90.9
No	48 (13.5)	10.9-16.1	308 (86.5)	83.9-89.1

The results of the chi-square test revealed there was not a statistically significant relationship between sexual education and STI diagnosis $p > .685$ (see Table 12). The results of the chi-square test for the relationship between sexual education during college classes and STI diagnoses were not statistically significant $p > .211$. There is a statistically significant relationship between sex (gender), and STI diagnoses $p < .000$. The demographic variable race had a statistically significant relationship with STI diagnosis $p < .029$.

Table 12

Chi-square Test of Association Analysis of Sexual Education by STI Diagnosis (n = 656)

Characteristics	χ^2	Sig.	df
Age	1.685	0.431	2
Sex	14.037	0.000**	1
Race	7.321	0.029*	2
Class status	1.166	0.761	3
Marital status	2.223	0.379	2
Sexual orientation	0.282	0.595	2
Sex ed prior to college	0.757	0.685	2
Sex ed during college	3.113	0.211	2

Note. *$p < .05$ **$p < .01$ ***$p < .0001$

A multinomial logistic regression analysis was conducted to analyze the relationship between the sexual education variables and the STI diagnosis variables. The summarized results (adjusted odds ratio (OR) and the CI) of the multinomial logistic analysis are presented in Tables 13 and 14. There was a significant relationship between having a sexual education program and being diagnosed with an STI among the college-aged students in Virginia ($p = .004$). Females that had sexual education were 4.4 times more likely to be diagnosed with an STI than the males. Black respondents were 2.7 times more likely to be diagnosed with an STI than White respondents. Therefore, there was significant evidence to accept the null hypothesis when determining the relationship between having a sexual education program and being diagnosed with an STI among college-aged students in Virginia, adjusting for potential confounders.

Table 13

Multinomial Regression of Sexual Education Before College by STI Diagnosis (n = 656)

	STI Diagnosis Yes	STI Diagnosis No
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Age		
18-19 years of age	0.5 (0.2-1.7)	1.9 (0.6-6.1)
20-21 years of age	0.6 (0.3-1.3)	1.6 (0.8-3.6)
22-24 years of age	1.00[b]	1.00[b]
Sex		
Female	4.4 (1.9-9.9)**	0.2 (0.1-0.5)**
Male	1.00[b]	1.00[b]
Race		
White	1.5 (0.5-4.0)	0.7 (0.3-1.9)
Black/African American	2.7 (0.9-7.5)	0.4 (0.1-1.1)
Other	1.00[b]	1.00[b]
Class status		
Freshmen	1.3 (0.4-4.6)	0.7 (0.2-2.8)
Sophomore	1.8 (0.7-4.6)	0.6 (0.2-1.5)
Junior	0.9 (0.4-2.0)	1.1 (0.5-2.4)
Senior	1.00[b]	1.00[b]
Marital status		
Never married	0.5 (0.2-1.4)	1.9 (0.7-5.0)
Married/Other	1.00[b]	1.00[b]
Sexual orientation		
Heterosexual	0.9 (0.5-1.7)	1.1 (0.6-2.2)
Gay/Lesbian/Bisexual	1.00[b]	1.00[b]
Sex ed prior to college		
Yes	1.0 (0.4-2.6)	1.0 (0.4-2.8)
No	1.00[b]	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Table 14

Multinomial Regression of Sexual Education During College by STI Diagnosis (n = 656)

	STI Diagnosis Yes	STI Diagnosis No
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Age		
18-19 years of age	0.5 (0.1-1.7)	1.8 (0.6-6.0)
20-21 years of age	0.6 (0.3-1.3)	1.6 (0.8-3.5)
22-24 years of age	1.00[b]	1.00[b]
Sex		
Female	4.3 (1.9-9.9)**	0.2 (0.1-0.5)**
Male	1.00[b]	1.00[b]
Race		
White	1.5 (0.5-4.0)	0.7 (0.3-1.9)
Black/African American	2.6 (0.9-7.5)	0.4 (0.1-1.1)
Other	1.00[b]	1.00[b]
Class status		
Freshmen	1.2 (0.4-4.7)	0.8 (0.2-2.8)
Sophomore	1.8 (0.7-4.6)	0.6 (0.2-1.5)
Junior	0.9 (0.4-2.0)	1.1 (0.5-2.4)
Senior	1.00[b]	1.00[b]
Marital status		
Never married	0.5 (0.2-1.4)	1.9 (0.7-5.0)
Married/Other	1.00[b]	1.00[b]
Sexual orientation		
Heterosexual	0.9 (0.5-1.7)	1.1 (0.6-2.2)
Gay/Lesbian/Bisexual	1.00[b]	1.00[b]
Sex ed during college		
Yes	1.0 (0.6-1.6)	1.0 (0.6-1.8)
No	1.00[b]	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Research question 3. Research Question 3 was "Controlling for all other potential risk factors, what is the association between student participation in risky sexual behaviors and race among college-aged students in Virginia?" A chi-square test and multiple logistic regression analysis were conducted to examine the relationship between race and college-aged students participating in risky sexual behaviors. The descriptive outcome among the variables is displayed in Table 15. The sample included the respondents who had sexual intercourse 513 (78.2%) of the study population (N = 656) compared to those who had never had sexual intercourse 142 (21.8). It was found that the majority of the sample was White (n = 380, 57.9%), 190 (29.0%) were Black, and 86 (13.1%) responded that they were Other.

Table 15

Descriptive Statistics of Race by All Sexual Behavior Variables (n = 656)

	Race					
	White		Black/ African American		Other	
	n (%)	95% CI	*n* (%)	95% CI	*n* (%)	95% CI
Characteristics	300 (58.5)	54.1-61.7	148 (28.8)	25.5-32.5	65 (12.7)	10.5-16.7
Sexual intercourse						
Yes	300 (58.5)	54.7-62.3	148 (28.8)	25.3-32.3	65 (12.7)	10.2-15.3
No	80 (55.9)	52.1-59.7	42 (29.4)	25.9-32.9	21 (14.7)	12.0-17.4
Age of first sexual intercourse						
13 years old or younger	10 (33.3)	29.2-37.4	16 (53.4)	49.1-57.7	4 (13.3)	10.4-16.2
14-16 years old	136 (57.6)	53.3-61.9	68 (28.8)	24.9-32.7	32 (13.6)	10.6-16.6
17 years old or older	154 (62.4)	58.2-65.6	64 (25.9)	22.1-29.7	29 (11.7)	8.9-14.5
Number of sex partners						
1 person	79 (66.4)	62.3-70.5	27 (22.7)	19.1-26.3	13 (10.9)	8.0-13.6
2- 4 people	105 (60.0)	55.8-64.2	47 (26.9)	23.1-30.7	23 (13.1)	10.2-16.0
5 or more people	116 (53.0)	48.7-57.3	74 (33.8)	29.7-37.9	29 (13.2)	10.3-16.1
Sex partners in past 3 months						
No sex in past 3 months	48 (55.2)	50.9-59.5	28 (32.2)	28.2-36.2	11 (12.6)	9.7-15.5
1 person	202 (63.3)	59.1-67.5	75 (23.5)	19.8-27.2	42 (13.2)	10.3-16.1
2 or more people	50 (46.7)	42.4-51.0	45 (42.1)	37.8-46.4	12 (11.2)	8.5-13.9
Sexual intercourse in 30 days						
0- 3 times	143 (54.8)	50.5-59.1	89 (34.1)	30.0-38.2	29 (11.1)	8.4-13.8
4 to 9 times	80 (61.1)	56.9-65.3	34 (26.0)	22.2-29.8	17 (12.9)	10.0-15.8
10 or more times	77 (63.6)	59.4-67.8	25 (20.7)	17.2-24.2	19 (15.7)	12.6-18.6
Condom use						
Never used a condom	87 (56.9)	52.6-61.2	43 (28.1)	24.2-32.0	23 (15.0)	11.9-18.1
Sometimes used a condom	140 (57.1)	52.8-61.4	75 (30.6)	26.6-34.6	30 (12.3)	9.5-15.1
Always used a condom	73 (63.5)	59.3-67.7	30 (26.1)	22.3-29.9	12 (10.4)	7.8-13.0
Oral sex no condom						
0 times	15 (48.4)	44.1-52.7	13 (41.9)	37.6-46.2	3 (9.7)	7.1-12.3
1-4 times	34 (44.7)	40.4-49.0	29 (38.2)	34.0-42.4	13 (17.1)	13.8-20.4
5 or more times	251 (61.8)	57.6-66.0	106 (26.1)	22.3-29.9	49 (12.1)	9.3-14.9
Anal sex no condom						
0 times	210 (56.9)	52.6-61.2	114 (30.9)	26.9-34.9	45 (12.2)	9.4-15.0
1-4 times	65 (65.0)	60.9-69.1	22 (22.0)	18.4-25.6	13 (13.0)	10.1-15.9
5 or more times	25 (56.8)	52.5-61.1	12 (27.3)	23.4-31.2	7 (15.9)	12.7-19.1

(table continues)

	Race					
	White		Black/ African American		Other	
	n (%)	95% CI	*n* (%)	95% CI	*n* (%)	95% CI
Hooking up						
0 times	211 (57.7)	53.4-62.0	115 (31.4)	27.4-35.4	40 (10.9)	8.2-13.6
1-4 times	57 (62.6)	58.4-66.8	20 (22.0)	18.4-25.6	14 (15.4)	12.3-18.5
5 or more times	32 (57.1)	52.8-61.4	13 (23.2)	19.6-26.9	11 (19.7)	16.3-23.1
Sex with alcohol/drugs						
0 times	71 (52.2)	47.9-56.5	45 (33.1)	29.0-37.2	20 (14.7)	11.6-17.8
1-4 times	122 (60.1)	55.9-64.3	61 (30.0)	26.0-34.0	20 (9.9)	7.3-12.5
5 or more times	107 (61.5)	57.3-65.7	42 (24.1)	20.4-27.8	25 (14.4)	11.4-17.4
Sex with New Partner						
0 times	141 (59.7)	55.5-63.9	61 (25.8)	22.0-29.6	34 (14.5)	11.5-17.6
1-4 times	110 (57.0)	52.7-61.3	59 (30.6)	26.6-34.6	24 (12.4)	9.6-15.3
5 or more times	49 (58.3)	54.0-62.6	28 (33.3)	29.2-37.4	7 (8.4)	6.0-10.8
Sex with partner and STI diagnosis						
Yes	3 (27.3)	23.4-31.2	6 (54.5)	50.2-58.8	2 (18.2)	14.9-21.5
No	297 (59.2)	55.0-63.5	142 (28.3)	24.4-32.2	63 (12.5)	9.6-15.4
Multiple Sex Partners						
0 times	168 (57.9)	53.6-62.2	81 (27.9)	24.0-31.8	41 (14.2)	11.2-17.2
1-4 times	111 (59.1)	54.9-63.4	54 (28.7)	24.8-32.6	23 (12.2)	9.4-15.0
5 or more times	21 (60.0)	55.8-64.2	13 (37.1)	32.9-41.3	1 (2.9)	1.5-4.4

A chi-square test of association was conducted to examine the relationship between race and the sexual behavior variables. The results from the chi-square tests are summarized in Table 16. There was a statistically significant relationship between race and the demographic variable class status $p < .017$. The chi-square test showed that there was a statistically significant relationship between race and the sexual behavior variables age of first sexual intercourse $p < .024$, oral sex no condom $p < .033$, and number of sex partners in the past three months $p < .007$.

Table 16

Chi-square Test of Race by Sexual Behaviors (n = 656)

Characteristics	χ^2	Sig.	df
Age	7.073	0.132	4
Sex	1.282	0.527	2
Race	4.605	0.33	4
Class status	15.465	0.017*	6
Marital status	1.897	0.755	4
Sexual orientation	6.825	0.033*	2
Sexual intercourse	0.481	0.786	2
Age of first sexual intercourse	11.204	0.024*	4
Number of sex partners	6.512	0.164	4
Sex partners in past 3 months	14.165	0.007**	4
Sexual intercourse in 30 days	8.383	0.079	4
Condom use	2.395	0.664	4
Oral sex no condom	10.465	0.033*	4
Anal sex no condom	3.541	0.472	4
Hooking up	6.827	0.145	4
Sex with alcohol/drugs	5.677	0.225	4
Sex with new partner	3.475	0.482	4
Sex with partner and STI diagnosis	4.714	0.095	2
Multiple sex partners	4.14	0.387	4

Note. *$p < .05$ **$p < .01$ ***$p < .0001$

A multinomial logistic regression analysis was conducted to analyze the association between race and sexual behavior of the Virginia college-aged students. The summarized results (adjusted odds ratio (OR) and the CI) of the multinomial logistic analysis are presented in Tables C8 through C13. The full model indicated the association between race and sexual behaviors was statistically significant ($p = .002$). Race and the sexual behavior variable number of sex partners in the past three months were statistically significant ($p = .028$). There was not a statistically significant relationship between race and the other sexual behavior variables (see Table C8). It was indicated that

the White respondents were 3.5 times more likely to engage in risky sexual behaviors compared to the Black and Other respondents (p = .002). Therefore, there was significant evidence to reject the null hypothesis when determining if there is an association between race and sexual behaviors because it was more likely for a White student to participate in risky sexual behaviors than the Black students and the students who responded as "Other."

Females were 6.5 times more likely than males to have engaged in sexual intercourse (p = .000). The student respondents ages 20-21 years were 4.8 times more likely to have had their first sexual intercourse at age 17 years or older (p = .014). Female students were 4 times more likely to have had sexual intercourse for the first time at age 17 years or older compared to males (p = .487). White students were 2.4 times more likely to engage in their first sexual intercourse at age 17 years or older than Black students (p = .160). The students who were age 20-21 years old were 2.3 times more likely to have 2-4 sex partners within their lifetime than those students who were 18-19 years and 22-24 years old (p = .015). It was also noted that the White respondents were 1.8 times more likely to have only one sex partner in their lifetime (p = .134).

A multinomial logistic regression analysis was conducted to examine the association between race and the sexual behavior variables: the number of sex partners in the past three months and sexual intercourse in the last thirty days. Females were 3.5 times more likely to have only one sex partner in the past three months compared to the males (p = .002). The 18-19 years old students were 1.6 times more likely to have 2 or more sex partners in the past three months compared to the 20-24 years old students (p =

.391). Moreover, the same 18-19 years old student respondents were 2 times more likely to have sex 10 or more times within the past 30 days compared to those students who were 20-24 years old (p = .189). Black students were 2.5 times more likely to have sex 0-3 times within the past 30 days than the White (p = .023). The results are presented in Table C9.

The results of the multinomial logistic regression analysis between race and the sexual behavior variables condom use and oral sex without the use of a condom are presented in Table C10. The 18-19 years old respondents were 1.8 times more likely always to use a condom than the students who are 20-24 years old (p = .410). Females were 2.2 times more likely to never use a condom during sexual intercourse compared to the males (p = .002). The White respondents were 1.8 times more likely to always engage in sexual intercourse with the use of a condom than the Black or Other respondents (p = .212). Students between the ages of 18-19 years were 2.6 times more likely to not engage in oral sex without the use of a condom than the 20-24 years old students (p = .306). Freshman respondents were 2.1 times more likely to have oral sex 5 or more times without a condom compared to the students within the other class statuses (p = .445). The Black respondents were 2.1 times more likely to not have oral sex without the use of a condom than the White respondents (p = .242).

A multinomial logistic regression model was conducted to examine the association between race and the sexual behavior variables anal sex without the use of a condom and hooking up. The results for the multinomial regression analysis are presented in Table C11. Students between the ages of 18-19 years were 1.2 times more

likely to have anal sex 5 or more times without the use of a condom compared to the 20-24 years old students (p = .768). Female students were 4.1 times more likely to not have anal sex without the use of a condom compared to the males (p = .068). Freshman respondents were 6.4 times more likely to hook up for sex 1-4 times in a lifetime than the other class statuses (p = .035). The Black respondents were 2.6 times more likely to not hook up for sex than the White respondents (p = .046).

I presented the results of the multinomial logistic regression analysis for race and sex with alcohol and drugs, and sex with a new partner without a sexual history (see Table C12). Females were 2.4 times more likely to have sexual intercourse 5 or more times with the use of alcohol or drugs than males (p = .000). The freshman respondents were also 3.5 times more likely to have sexual intercourse 1-4 times with the use of alcohol or drugs than the other class statuses (p = .016). It was indicated that the students between the ages 18-19 were 3.2 times more likely to have sex 1-4 times with a new partner before discussing their sexual history than those who were 20-24 years old (p = .047). Black students were 2.3 times more likely to engage in sex 5 or more times with a new partner without discussing their sexual history compared to the White (p = .100).

Table C13 summarizes the results of the multinomial regression analysis for race and partner diagnosed with STI and multiple sex partners. It was indicated that females were 7.1 times more likely to not have sex with a partner knowingly been previously diagnosed with an STI compared to the males (p = .485). White respondents were 3.3 times more likely to not have sex with a partner they knowingly were previously diagnosed with an STI than the Black respondents (p = .222). Females were also 5.5

times more likely to have sex 1-4 times with a partner who has sex with others during the same period than males (p = .881). Black respondents were 7.7 times more likely to have sex 5 or more times with partners who are having sex with others in the same period than White (p = .055).

Research question 4. Research Question 4 was "What are the students who attend a university in Virginia perceptions about having a sexual education course added to their college curriculum to help prevent them from contracting STIs?" To determine the college-aged students' perceptions about having sexual education courses in the college curriculum to help prevent STIs a chi-square test and multinomial logistic regression analysis was performed. Table 17 presents the descriptive outcome statistics for the model including the frequency distribution (n %) and confidence interval (CI). All the sample participants (N = 656) were eligible for the survey question involving their feeling about adding a sex education course in their college curriculum. There were 92.5% (n = 607) students ages 18-24 enrolled in a Virginia university to perceive that adding sexual education courses to the college curriculum will help prevent contracting STIs.

Table 17

Descriptive Statistics of Demographic Variables by Agreement with Adding Sex Ed to the College Curriculum (n = 656)

	Yes to adding sex ed in the college curriculum	
	n (%)	95% CI
Characteristics	607 (92.5)	90.5-94.5
Age		
18-19 years of age	124 (32.7)	28.9-36.4
20-21 years of age	138 (36.4)	32.6-40.2
22-24 years of age	117 (30.9)	27.2-34.6
Sex		
Male	92 (24.3)	20.9-27.7
Female	286 (75.5)	72.1-78.9
Other	1 (0.3)	0.0-0.7
Race		
White	193 (50.9)	46.9-54.9
Black/ African American	135 (35.6)	31.8-39.4
Other	51 (13.5)	10.8-16.2
Class Status		
Freshmen	87 (23.0)	19.7-26.4
Sophomore	75 (19.8)	16.6-22.9
Junior	94 (24.8)	21.4-28.2
Senior	123 (32.5)	28.8-36.2
Marital status		
Never married	338 (89.2)	86.7-91.7
Married	22 (5.8)	3.9-7.7
Other	19 (5.0)	3.3-6.7
Sexual orientation		
Heterosexual	306 (80.7)	77.6-83.8
Gay/Lesbian/Bisexual	68 (17.9)	14.9-20.9
Not Sure	5 (1.3)	0.4-2.2
Sex ed prior to college		
Yes	348 (91.8)	89.6-93.9
No	28 (7.4)	5.3-9.5
Not Sure	3 (0.8)	0.0-0.3
Sex ed during college		
Yes	134 (35.4)	31.6-39.2
No	234 (52.7)	48.7-56.7
Not Sure	11 (2.9)	1.6-4.2

A chi-square test of association was conducted to determine if there is a significant relationship between the demographic variables and the sexual education variables to include adding sexual education to the college curriculum. The results of the chi-square test for the perceptions of sexual education added to the college curriculum showed a statically significant relationship between the demographic and sexual education variables. Age $p < .001$; sex (gender) $p < .000$; race $p < .000$; and class status, $p < .002$; sex education during college, $p < .000$. There was not a statically significant association between adding sexual education to the college curriculum and prior sex education. The results of the chi-square test are summarized in Table 18.

Table 18

Chi-square Test of Agreement to Adding Sex Ed to the College Curriculum (n = 656)

Characteristics	χ^2	Sig.	df
Age	19.735	0.001**	4
Sex	31.145	0.000***	4
Race	22.834	0.000***	4
Class status	21.346	0.002**	6
Marital status	3.418	0.49	4
Sexual orientation	7.51	0.111	4
Sex ed prior to college	9.231	0.056	4
Sex ed during college	22.371	0.000***	4

Note. $*p < .05$ $**p < .01$ $***p < .0001$

A multinomial logistic regression analysis was conducted to analyze the outcome of the students' perceptions of sexual education added to the college curriculum and the demographic and sexual education variables. The summarized results (adjusted odds ratio (OR) and the CI) of the multinomial logistic analysis are presented (see Table 19). The model was statistically significant to determine the student's perceptions of adding sexual

education course to the college curriculum (p = .000). The analysis also concluded that the students who received sexual education prior to college and during college was statistically significant to determine the student's perceptions of adding sexual education courses to the college curriculum (p = .000). Females were 8.3 times more likely to perceive that if STI courses are added to the college curriculum, it will help prevent students from contracting STIs compared to the males (p = .000). The results also indicated that the students aged 20- 21 years old enrolled in a Virginia university were 2.2 times more likely to perceive that adding sexual education courses to the college curriculum will help prevent contracting STIs than the 18-19 years old and the 22-24 years old students (p = .764).

I conducted a logistic regression analysis to examine the perceptions of the college-aged students enrolled in a Virginia university of including sexual education courses in the college curriculum. There was a significant relationship between the demographic and sexual education variables and the students' perceptions of sexual education in the college curriculum. Therefore, there was significant evidence to accept the null hypothesis when determining that the college-aged student between the ages of 18 years and 24 years old perceive that adding sexual education to the college curriculum will help prevent contracting STIs among the college-aged student population.

Table 19

Multinomial Regression Analysis of Demographic Variables by Agreement with STI Courses (n = 656)

	Yes to STI courses
Characteristics	Adjusted OR (95% CI)
Age	
18-19 years of age	0.4 (0.2-0.6)
20-21 years of age	2.2 (1.4-3.5)
22-24 years of age	1.00[b]
Sex	
Female	8.3 (5.0-1.9)**
Male	1.00[b]
Race	
White	0.6 (0.3-1.1)
Black/African American	1.00[b]
Class status	
Freshmen	0.4 (0.2-0.6)**
Sophomore	0.5 (0.3-0.9)*
Junior	0.7 (0.4-1.4)
Senior	1.00[b]
Marital status	
Never married	0.9 (0.4-2.3)
Married	1.00[b]
Sexual orientation	
Heterosexual	3.7 (1.1-12.6)*
Gay/Lesbian/Bisexual	1.00[b]
Sex ed prior to college	
Yes	3.4 (0.7-16.1)
No	1.00[b]
Sex ed during college	
Yes	4.2 (1.5-11.6)**
No	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Research question 5. Research Question 5 was "What are the college-age students in Virginia's perceptions about the chances of contracting an STI if they do not use a condom during sexual intercourse?" To determine the college-aged students' perceptions about the chances of contracting an STI if they do not use a condom during sexual intercourse, a chi-square test and multinomial logistic regression were performed. Table C14 displays the descriptive outcome statistics for the model including the frequency distribution (*n* %) and confidence interval (CI). There were 29.8% (*n* = 392) of the students to respond that it is likely or very likely to contract an STI if they were to engage in sexual intercourse without the use of a condom. The remaining population of students 40.3% (*n* = 264) responded that it was either unlikely or impossible to contract an STI if a condom was not used during sexual intercourse.

A chi-square test of association was conducted to examine if there is a relationship between sexual education and the students' perceptions of contracting STIs if no condom is used during sexual intercourse. The results of the chi-square test indicated a statically significant relationship between the demographic variables sex (gender) $p <$ .028; race $p < .000$; and sexual orientation $p < .001$ and the students' perception of contracting STIs if a condom is not used during sexual intercourse. There was not a statistically significant relationship between the sexual education variables and perception of contracting STIs if a condom is not used during sexual intercourse. The results of the chi-square test are presented in Table 20.

Table 20

Chi-square Test of Contracting STI Without a Condom by Sex Ed (n = 656)

Characteristics	χ^2	Sig.	df
Age	9.27	0.159	6
Sex	14.145	0.028*	6
Race	25.363	0.000***	6
Class status	14.3	0.112	9
Marital status	23.213	0.001**	6
Sexual orientation	10.974	0.089	6
Sex ed prior to college	5.316	0.504	6
Sex ed during college	9.915	0.128	6

Note. *$p < .05$ **$p < .01$ ***$p < .0001$

A multinomial logistic regression analysis was conducted to analyze the outcome between sexual education and the perceptions of contracting an STI if a condom is not used during sexual intercourse. The summarized results (adjusted odds ratio (OR) and the CI) of the multinomial logistic analysis are presented (see Table 21). The model was statistically significant to determine the student's perceptions of contracting an STI if a condom is not used during sexual intercourse ($p = .000$). The results from the analysis showed that it was 1.8 times more likely for the students aged 20- 21 years to perceive that it is likely to contract STIs if a condom is not used during sexual intercourse compared to those who were 18-19 years and 22-24 years ($p = .160$). The student respondents aged 18-19 years were 0.5 times more likely to perceive that it was very likely to contract an STI if a condom is not used during sexual intercourse than the 20-24 years old respondents ($p = .559$). Female students were 3 times more likely to perceive that it was very likely to contract an STI if a condom is not used during sexual intercourse than males ($p = .381$). The students that responded they had had previous

sexual education were 1.9 times more likely to perceive that if a condom is not used during sexual intercourse then it was likely to contract an STI than those who did not have a previous sexual education (p = .717).

A multinomial logistic regression analysis was conducted to examine the perceptions of the college-aged students enrolled in a Virginia university of contracting an STI if there is no use of a condom during sexual intercourse. There was a significant relationship between the demographic variables and the students' perceptions of contracting an STI if a condom is not used during sexual intercourse. Therefore, there was significant evidence to accept the null hypothesis when determining that the college-aged student between the ages of 18 years and 24 years old perceive that if no condom is used during sexual intercourse, it is likely to contract an STI.

Table 21

Multinomial Regression Analysis of Demographic and Sex Education Variables by Contracting a STI Without Condom Use (n = 656)

	Contracting a STI is impossible	Contracting a STI is unlikely	Contracting a STI is likely	Contracting a STI is very likely
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Age				
18-19 years of age	0.7 (0.3-1.3)	0.6 (0.4-0.9)*	1.5 (0.8-2.9)	0.5 (0.3-0.9)*
20-21 years of age	0.5 (0.3-1.1)	0.6 (0.4-0.9)*	1.8 (0.9-3.8)	0.6 (0.4-1.0)*
22-24 years of age	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex				
Male	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Female	0.6 (0.1-9.3)	1.0 (0.7-1.5)	1.0 (0.7-1.5)	3.0 (0.2-49.4)
Race				
White	0.6 (0.3-1.3)	1.5 (0.8-2.8)	1.7 (0.8-3.9)	0.5 (0.3-1.0)*
Black/ African American	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Class status				
Freshmen	1.4 (0.6-3.0)	0.7 (0.4-1.2)	0.7 (0.3-1.6)	0.6 (0.4-1.1)
Sophomore	0.8 (0.3-1.9)	0.5 (0.3-0.8)*	1.3 (0.5-3.0)	0.5 (0.3-0.8)*
Junior	1.3 (0.6-2.9)	0.6 (0.4-1.0)	0.8 (0.4-1.7)	0.7 (0.4-1.3)
Senior	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Marital status				
Never married	1.9 (0.4-8.6)	2.2 (0.8-5.9)	0.5 (0.1-2.4)	0.9 (0.4-1.9)
Married	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sexual orientation				
Heterosexual	3.1 (0.4-25.0)	0.7 (0.1-6.4)	0.3 (0.1-2.6)	2.3 (0.1-37.4)
Gay/Lesbian/Bisexual	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex ed prior to college				
Yes	0.5 (0.1-5.9)	0.9 (0.1-6.4)	1.9 (0.2-21.3)	0.7 (0.1-5.1)
No	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex ed during college				
Yes	0.5 (0.2-1.8)	3.9 (0.1-17.6)	1.9 (0.6-6.6)	1.4 (0.4-4.8)
No	1.00[b]	1.00[b]	1.00[b]	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Summary

This research study was conducted to measure the relationship between sexual education and risky sexual behaviors among college-aged students enrolled in a Virginia university. The dependent variable sexual behaviors were compromised of the sexual risk questions, to include sexual intercourse, age of first sexual intercourse, number of sex partners in lifetime, sex partners in past three months, condom use, oral sex without condom, anal sex without condom, random hooking up, sex while using alcohol and drugs, sex with new partner without prior history, sex with a partner with a known STI diagnosis, and sex with a partner who has multiple sex partners. The independent variable sexual education was compromised of questions related to sexual education prior to college, sexual education in college classes, and the students' perceptions of contracting STIs if no condom is used during sexual intercourse and adding sexual education to the college curriculum to prevent STIs among Virginia college campuses. Multinomial logistic regression analysis and chi-square test of association were conducted to examine the five research questions and hypotheses.

Descriptive statistics were conducted by the researcher using frequencies. The sample population (N = 656) consisted of Virginia college students between the ages of 18-24 years that responded to the survey. A total of 607 (92.5%) of the sample population, responded that they had some form of sexual education either before attending college or during college. There were 486 (80.1%) students who had some form of sexual education and had engaged in sexual intercourse.

The chi-square analysis between sexual education and sexual behaviors did not show a statistically significant relationship. However, the model did show significance with class status $p < .000$ and sex with a partner diagnosed with an STI $p < .002$. The chi-square test for research question two did not show a significant relationship between sexual education and STI diagnoses, prior to college $p > .685$ and during college $p > .211$. Although the full model was not statistically significant, it was significant with the demographic variables sex (gender) $p < .000$ and race $p < .029$. The chi-square test results for race and sexual behaviors did present a statistically significant relationship $p < .002$. The chi-square test showed that there was a statistically significant relationship between race and the sexual behavior variables age of first sexual intercourse $p < .024$, oral sex no condom $p < .033$, and the number of sex partners in the past three months $p < .007$. The results of the chi-square test for adding sex education to the college curriculum was not statistically significant with sexual education prior to college. Adding sex education to the college curriculum was significant with sexual education during college $p < .000$, and the demographic variables (age $p < .001$, sex (gender) $p < .000$, race $p < .000$, and class status $p < .002$). The chi-square results for contracting an STI without the use of a condom was not statistically significant to sexual education. The model did show significance to sex (gender) $p < .028$, race $p < .000$, and sexual orientation $p < .001$.

I conducted multinomial logistic regression analysis to examine the relationships between sexual education and sexual behaviors. The results of the multinomial logistic regression analysis between sexual education and sexual behavior showed a statistically significant relationship ($p = .002$), supporting the null hypothesis. There was also

evidence that sexual education and STI diagnosis was statistically significant ($p = .003$). The findings also showed that there was a statistically significant association between sexual behavior and race ($p = .002$) with White students ($n = 380$, 57.9%) making up the majority of the sample. However, the multinomial logistic analysis for the sexual behavior and race model showed a statistically significant; it did not support the null hypothesis. Therefore, the null hypothesis was rejected.

The students' perception of including sexual education course into the college curriculum to help prevent STIs also was statistically significant ($p = .000$) and supported the null hypothesis. The results of the logistic regression analysis for the perception of contracting an STI if no condom is used during sexual intercourse was statistically significant ($p = .000$) and supported the null hypothesis. The key findings of the analysis also indicated that those students who had some form of sexual education and were sexually active are less likely to engage in risky sexual behaviors.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to examine the relationship between sexual education and sexual behavior among college students between the ages of 18-24 who attend a Virginia university. A quantitative analysis was conducted to get a better understanding of if and how sexual education could help prevent students from participating in risky sexual behaviors. Regression analysis was used to determine the statistical relationships between the independent and outcome variables.

Five research questions helped determine the relationship between reported sexual education and reported sexual behaviors among college students who are currently attending Virginia universities. The first research question explored the relationship between sexual education and participation in risky sexual behaviors, which were shown in the results to have a statistically significant relationship. The second research question concerned the relationship between having a sexual education and being diagnosed with an STI, which also showed a statistically significant relationship. The third research question helped analyze the association between student reported participation in risky sexual behaviors and race, which were shown to have a statistically significant association. Research question four regarded how the students felt about including sexual education courses in their college curriculum to help prevent the spread of STIs. The data collected for this question demonstrated that there is a statistically significant relationship between the student's reported feelings and sexual education during college. The final research question explored the perceptions of the students about contracting an STI if

they did not use a condom during sexual intercourse. There was a statistically significant relationship between the student's reported perceptions of STI risk and the demographic variables.

Interpretation of the Findings

Sexual Education

The findings confirm previous research that sexual education plays a significant role in the prevention of STIs and contributes to healthier lifestyles (Lloyd et al., 2012). For instance, Oswalt et al. (2015) concluded that many college students do not remember the importance of sexual education courses when they are engaging in sexual practices. Studies like this support the findings for this research because there were 61.9% of sexually active students who had received sexual education before college and reported that they did not regularly use condoms during sexual intercourse. Additionally, research has indicated that students have relevant knowledge of STIs but continue to engage in risky sexual behaviors (Zhang et al., 2015). In this current study, 57.8% of the students reported that they believed that adding sexual education courses to their college curriculum would help decrease STIs. Further, 91.8% of the students who had previous sexual education reported they believed adding sexual education courses to the curriculum would also help to prevent STI transmission. These findings confirm previous research that youth and young adults have the highest rate of behavior change, so using sexual education as a prevention method can contribute to STI prevention (Stranger-Hall & Hall, 2011).

Sexual Behaviors

Risky sexual behaviors such as unprotected sex, multiple sex partners, and sex with the use of alcohol and drugs are known to increase the chances of being exposed to STIs (Mair, Ponicki, & Gruenewald, 2015). College students seem to have relevant knowledge of STIs but will continue to engage in risky sexual behavior (Zhang et al., 2015). These forms of behavior are connected to the findings of this study as well as previous studies of U.S. college students and the use of condoms during sexual intercourse. Eisenberg and Garcia (2014) found that 31% of college students in the United States do not use condoms, and 30% of that same group indicated their unprotected sex was with a stranger or new partner. The findings of this study showed that 23.3% of the students in Virginia universities have never used a condom, and 37.3% of the students sometimes use a condom during sexual intercourse. This finding is a total of 60.6% of the student population in Virginia universities with a higher risk of not using a condom during sexual intercourse. The findings of this study also confirmed research by the ACHA (2006) that concluded that 53% of college students would consistently engage in sexual intercourse without the use of a condom.

In this current study, the findings for the sexual behavior variables—sexual intercourse, age at first sexual intercourse, number of sex partners, oral and anal sex condom use, sex with drugs and alcohol use, and multiple sex partners—also aligned with previous research. There were 51.9% of the sample population to respond as having had sexual intercourse. Of that same group, 40.6% had sex for the first time before the age of 17. These findings confirm Zhang et al.'s (2015) finding that the age of youth and

young adult's first sexual intercourse was 16.7 years of age. This result also supports Baldwin and Baldwin (2010), who found that the most consistent predictor of cautious sexual behavior was the age of the student's first sexual intercourse.

STI Diagnosis

The finding for STI diagnosis confirms previous research conducted by the CDC (2017) that young adults between the ages of 18-24 are 4 times more likely to be diagnosed with an STI than those who are in the 18-65 age groups. There were 12.9% (66) of the students to report to having had a previous sexual education. Of that same group, 12.8% (62) reported they had been diagnosed with an STI in their lifetime. It was also found that the female students who reported having previous sexual education were 4.4 times more likely to be diagnosed with an STI than the males. These findings confirm Oswalt and Watt's (2103) study that sexual intercourse among college students between the ages of 18-24 are at a higher risk of contracting STIs. The CDC (2016a) has also mentioned that STIs are primarily high among the female population between the ages of 15-24.

Race

Previous research was conducted on race and how sexual education influence STI diagnosis among the different races, which the results of this study support. For example, Hendrickx et al. (2008) reported that minority groups are at increased risk of contracting an STI because of the lack of sexual education and their affiliated social statuses. The finding for this current study confirms this finding because Blacks were 2.7 times more likely to be diagnosed with an STI than the Whites. These findings also confirm the

CDC's (2016b) finding that Black youth in Virginia account for 40% of the most recent cases reported for STIs compared to the 16% of STIs reported for the White youth. Additionally, the results showed that Blacks were 1.6 times more likely to use alcohol and drugs during sexual intercourse than the Whites. Blacks were also 7.7 times more likely to engage in sexual intercourse five or more times with multiple sex partners than Whites.

Contracting an STI

A Youth Risk Behavior Survey report indicated that sexual behaviors are the most significant contributor to STI diagnosis (Zhang et al., 2015). It was found that 59.8% students reported that they believed it was either likely or very likely to contract an STI if they did not use a condom compared to the 40.3% of students who reported that it was unlikely or impossible. The female students were 3 times more likely to believe that is was very likely to contract an STI if no condom was used during sexual intercourse. The finding for this study confirms these findings, as students who reported to have had previous sexual education were 1.7 times more likely to believe that it is likely to contract an STI without the use of a condom.

Health Belief Model

The results suggested that sexual education is directly related to how the students who attend Virginia universities participate in risky sexual behaviors. For example, the results showed that the college-aged students in Virginia would more likely participate in safe sexual practice if they perceived that the risk of not using a condom during sexual intercourse has a negative benefit, for example, contracting an STI. The HBM was used

to identify if introducing sexual education to the college students in Virginia between the ages of 18-24 would help change their sexual behaviors. The HBM also guided this study to build on the students' existing knowledge of STI risk with the intention of motivating change in their sexual behaviors to prevent the spread of STIs. The HBM consists of six aspects of assessments which the individual perceives: susceptibility, severity, self-efficacy, actions, barriers, and benefits (Schiavo, 2007).

The findings aligned with the HBM in multiple ways. For example, students' perceived susceptibility aligns with how they participate in risky sexual behaviors, indicating that the results are consistent with the HBM because the students perceive that if they receive sexual education in their college curriculum, they will help prevent the spread of STIs. The findings also aligned with the HBM because the model suggests that behavior will change among youth and young adults when knowledge or education to make them aware of their risk is introduced (Becker et al., 1977). The students perceived that after introducing knowledge and risk of a disease to the college student population using their curriculum, their beliefs will cause them to take actions to achieve positive benefits. The positive benefits include the availability of condoms to students, significant increases in condom use during sexual intercourse, changes in other sexual behaviors to decrease STI risk, increased health screenings and testing, and decreased STI reported cases among the college campuses and even the communities in which they are surrounded by.

Limitations of the Study

There were several limitations noted for this study. The study was limited to college students between the ages of 18-24 who attended a university in the state of Virginia. The sample was also limited to only students who had a class status of freshman to senior. There was evidence of some selection bias because all graduate students were excluded regardless if they met the age qualifications.

The second limitation was that data were collected using online surveys. The use of online questionnaires limited the data to self-reported surveys only. Self-report procedures are subject to non-response bias and memory errors. The students were more likely to answer the survey with more socially desirable responses rather than the reporting of the actual number of times they have participated in some form of sexual intercourse. For example, a student who has had unprotected sexual intercourse more than ten times in their lifetime may report they have had sexual intercourse without a condom one to two times in their lifetime.

The third limitation was the possibility of recall bias. The students' ability to recall the actual sexual events and time could affect the results by providing inaccurate answers to the survey questions. Although, potential bias was minimized by using internet-based survey software to administer the survey instrument to the sample population; the willingness for students to participate or disclose potentially sensitive information also limited this study. Many of the student participants could have been more likely to not participate because of their fear of others knowing their sexual history.

Recommendations

Based upon findings from this study, it is recommended that colleges and universities collaborate with the CDC and local health agencies to develop an educational program appropriate for post-secondary education curriculums which can help prevent the spread of STIs and safe sexual health behaviors among college campuses. This study could influence universities to develop a better condom and sexual information program on campuses. The condom program could establish more accessible and acceptable ways of students obtaining condoms without being identified by faculty or other students as sexually active. This practice can assist with the problem of unprotected sexual intercourse and the inconsistencies with condom use. The program can also have an anonymous question and answer forum where students can ask personal sexually related questions and received answers without the student being identified.

Although the ACHA conducts annual studies on college students, further interventions should be done to address the results reported by these sexual behavior studies. Interventions can include groups that promote healthy lifestyles, address sexual health risk, and ways to prevent STIs without students feeling ashamed or embarrassed about seeking information. Continuing to research sexual education and its significance to sexual behaviors among college students will help healthcare providers understand why STI incidence continues to increase among this population and how to address it to decrease the cases reported.

Also, researchers should continue to use surveys to collect information on sexual behavior because the use of survey research can reach more students, not only students in

the state of Virginia but across all college campuses. It is also recommended that colleges and universities participate in keeping students more informed of safe sexual practices and current information regarding STIs and the communities in which they live by partnering with public health organizations. Promoting Healthy People 2020 initiatives across all campuses can also help strengthen university sexual education policies and practices.

Implications

This study was conducted to identify the relationship between reported sexual behavior and the past sexual education of college students. Analyzing the relationship between the two variables could leave a positive impact on the college campuses in Virginia and their surrounding communities. For example, assisting public health professionals by identifying if previous sexual education has a significant effect on the current sexual practices of college students by reducing the amount of reported STI cases on campus and increasing condom use. Another impact is the university's ability to provide sustainable sexual education among the college student population to improve their long-term sexual health and associated health outcomes.

Positive Social Change

The significance of positive social change was highlighted by the findings of this study because the students who reported having unprotected sexual intercourse and participating in risky sexual behaviors also reported they believed that adding sexual education to their college curriculum would help prevent STIs and increase the use of condoms. Sexual behavioral change could not only lower STI incidence and increase

condom use but could help prevent multiple sex partners and unplanned pregnancies. This study also helped to address some of the inconsistencies and misconceptions of why college students are among the group with the highest rates of STI incidence by the researcher examining student reported sexual education and then comparing it to their reported sexual behaviors to determine if there is a relationship (Zhang et al., 2015). The positive social change implications of the study include assisting the Virginia Education Board by helping them to determine the best college curriculum to provide education to the college student population in Virginia about practicing safe sexual behaviors. Providing more accurate information about sexual development and the seriousness of STIs could allow college students to understand their sexual choices and use the information to make safer and confident decisions regarding sex. Another positive impact from this study could influence increased communication, refusal, and negotiation skills. The study also could assist in promoting the public health initiatives in Virginia by educating school professionals and students to understand the seriousness of sex education. Educating the school professionals and the students could improve health outcomes and grow more responsible people on campus and within the surrounding communities. Moreover, adding sexual education could provide a safer sexual campus with fewer students contracting and transmitting STIs on campus and in the surrounding communities. This study provides a positive impact on public opinion, targets a specific audience, and is a cost-effective way of providing critical information to large numbers of people like college students.

It was found that respondents believed that sexual education should be included in the college curriculum. University health professions should also collaborate with the community's health organizations by getting more involved with implementing well-designed public education campaigns that are tailored to sexual education, college students, and their sexual practices could assist in enhancing the community's understanding of the nature and value of the STI prevention. Overall, this study could help promote healthy sexual behaviors, strengthen the campus sexual education policies, decrease STI incidence among the students, and increase access to prevention of STIs by highlighting the importance of sexual health and decreasing STI reported cases with the introduction of sexual education on college campuses.

Conclusion

I used this study to explore the relationship between sexual education and sexual behaviors. STIs affect all ages, races, genders, and social statuses. STI cases have remained the highest prevalence and risk among the college student population who are between the ages of 18-24. STIs have continued to increase throughout the young adult and college student populations for over the past decade (CDC, 2016b). The factors that have contributed to the increase of STIs among the ages 18-24 are lack of sexual education, demographics, social interactions, and engaging in risky sexual behaviors (Wilton et al., 2014).

Five research questions guided this quantitative cross-sectional study. I used the HBM to help predict sexual health behavior based upon respondent perception and education. It was found that there was a statistically significant relationship between

reported sexual education and sexual behaviors among Virginia college students between the ages of 18-24. I also found that there was a significant relationship between reported sexual education and race, with Whites having the higher risk. Sexual education was also statistically significantly related to reported STI diagnoses, with females having a 4.4 times higher risk than the males. The student's perceptions of contracting an STI if a condom is not used during sexual intercourse was also related to the demographic variables, with the students who reported having previous sexual education more likely to perceive it was very likely to contract an STI. It was highlighted that there is a need to continue sexual education beyond secondary education because college students would continue to engage in risky sexual behaviors although they had a previous sexual education. (Zhang et al., 2015).

I concluded that the student's perceptions of including sexual education in the college curriculum to help in STI prevention was associated with sex and class status of the students and having a previous sexual education. Females were 8.3 times more likely to agree to add sexual education courses, and the freshman and sophomore classes were .5 times more likely to agree. Although sex education does not entirely delay the initiation of sexual intercourse, it could positively impact young adult's sexual behavior to include the increase of condom use, lesser sex partners, and the delay of sexual intercourse (Kirby, Laris, & Rolleri, 2008). Other studies have found that introducing young adults to sex education may contribute to a decrease in STI reported cases among the exposed group (Stranger-Hall & Hall, 2011. There needs to be more collaboration among the college professionals, education systems, and public health professionals to

help increase the understanding and knowledge of STIs among the college student population. Providing education on STIs and the importance of long-term improved health and outcomes could help prevent the increase in the reported cases of STIs among the college-aged student population. Therefore, sexual education cannot wholly solve the problem of STIs but adding it to the college curriculum could contribute to students changing their sexual behaviors in a positive direction (Kirby et al., 2008).

References

Abbott, D. A., & Dalla, R. L. (2008). 'It's a choice, simple as that': youth reasoning for sexual abstinence or activity. *Journal of Youth Studies, 11*(6), 629-649. doi:10.1080/13676260802225751

Advocates for Youth (2009). Comprehensive sex education: Research and results. Retrieved from http://www.advocatesforyouth.org/storage/advfy/documents/fscse.pdf

American College Health Association. (2006). American College Health Association-national college health assessment: Reference group data report fall 2005. Retrieved from http://www.acha.org/documents/resources/survey_data/Pap_sti/ACHA_CY2014_PapTest_and_STI_Survey_fulldatareport.pdf

American College Health Association. (2013). American College Health Association-National College Health Assessment II: Reference Group Data Report Spring 2013. Retrieved from http://www.acha-ncha.org/docs/ACHA-NCHA-II_ReferenceGroup_DataReport_Spring2013.pdf

American College Health Association. (2016). ACHA 2015 PAP & STI survey. Retrieved from http://www.acha.org/documents/resources/survey_data/Pap_sti/ACHA_CY2014_PapTest_and_STI_Survey_fulldatareport.pdf

American Sexual Health Association. (2016). STDs/STIs. Retrieved from http://ashasexualhealth.org/STDs

Baldwin, J. D., & Baldwin, J. I. (1988). Factors affecting AIDS-related sexual risk-taking behavior among college students. *Journal of Sex Research, 25*(2), 181-196. doi:10.1080/00224498809551454

Barth, K. R., Cook, R. L., Downs, J. S., Switzer, G. E., & Fischhoff, B. (2002). Social stigma and negative consequences: Factors that influence college students' decisions to seek testing for sexually transmitted infections. *Journal of American College Health, 50*(4), 153-159. doi: 10.1080/07448480209596021

Becker, M. H., Maiman, L. A., Kirscht, J. P., Haefner, D. P., & Drachman, R. H. (1977). The health belief model and prediction of dietary compliance: A field experiment. *Journal of Health and Social Behavior*, 18(4) 348-366. doi: 10.2307/2955344

Bersamin, M., Garbers, S., Gold, M. A., Heitel, J., Martin, K., Fisher, D. A., & Santelli, J. (2016). Measuring success: Evaluation designs and approaches to assessing the impact of school-based health centers. *Journal of Adolescent Health, 58*(1), 3-10. doi: https://doi.org/10.1016/j.jadohealth.2015.09.018

Boonstra, H. D. (2012). Progressive and pragmatic: The national sexuality education standards for U.S. public schools. *Guttmacher, 15*(2), 2-7. Retrieved from https://guttmacher.org/pubs/gpr/15/2/gpr150202.pdf

Broman, C. L. (2007). Race, drug use and risky sexual behavior. *College Student Journal, 41*(4), 999-1010. Retrieved from http://www.projectinnovation.com/college-student-journal.html

Bryant, C. M., Heath, J. C., & Carter, V. L. (2014). Assessing the impact of social media on the risky sexual behaviors of college students. *Proceedings of the National*

Conference on Undergrad Research (NCUR), 2014, 1232-1239. Retrieved from http://www.ncurproceedings.org/ojs/index.php/NCUR2014/article/viewFile/1157/635

Cashwell, C. S., Giordano, A. L., King, K., Lankford, C., & Henson, R. K. (2016). Emotion regulation and sex addiction among college students. *International Journal of Mental Health and Addiction, 15*(1), 16-27. doi:10.1007/s11469-016-9646-6

Carey, M. P., & Schroder, K. E. (2002). Development and psychometric evaluation of the brief HIV knowledge questionnaire. *AIDS Education & Prevention, 14*(2), 172-182. doi:10.1521/aeap.14.2.172.23902

Cavazos-Rehg, P. A., Krauss, M. J., Spitznagel, E. L., Schootman, M., Bucholz, K. K., Peipert, J. F., . . . Bierut, L. J. (2009). Age of sexual debut among US adolescents. *Contraception, 80*(2), 158-162. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3064497/pdf/nihms252850.pdf

Centers for Disease Control, National Center for Chronic Disease Prevention and Health Promotion, Division of Adolescent and School Health. (1997). National College Health Risk Behavior Survey Questionnaire [Database record]. doi:10.1037/t04117-000

Centers for Disease Control and Prevention. (2008). New York City: Bringing HIV/AIDS prevention education into the spotlight. Retrieved from www.cdc.gov/HealthyYouth.com

Centers for Disease Control and Prevention. (2012). *Survey and data collection systems*.

Retrieved from http://www.cdc.gov/nchs/surveys.htm

Centers for Disease Control and Prevention. (2013). *Sexually transmitted infections among young Americans*. Retrieved from https://www.cdc.gov/std/products/youth-sti-infographic.pdf

Centers for Disease Control and Prevention. (2014). *STD health equity*. Retrieved from https://www.cdc.gov/std/health-disparities/default.htm

Centers for Disease Control and Prevention. (2015). Reported STDs in the United States 2014 national data for chlamydia, gonorrhea, and syphilis. Retrieved from http://www.cdc.gov/std/stats14/std-trends-508.pdf

Centers for Disease Control and Prevention. (2016a). Reported STDs in the United States: 2015 national data for chlamydia, gonorrhea, and syphilis. Retrieved from https://www.cdc.gov/nchhstp/newsroom/docs/factsheets/std-trends-508.pdf

Centers for Disease Control and Prevention. (2016b). *Sexually transmitted diseases.* Retrieved from http://www.cdc.gov/STD/

Centers for Disease Control and Prevention. (2017). *National survey of family growth: key statistics*. Retrieved from https://www.cdc.gov/nchs/nsfg/key_statistics/s.htm#vaginalsexual

Choi, M. S., & Ha, N. S. (2004). A study on knowledge, attitude, and experience in sex and sexual autonomy of college students. *Korean Journal of Women Health Nursing*, *10*(4), 318-330. Retrieved from https://kjwhn.org/Synapse/Data/PDFData/0102KJWHN/kjwhn-10-318.pdf

Cleland, J., Ingham, R., & Stone, N. (2001). *Asking young people about sexual and*

reproductive behaviors: Illustrative core instruments. Retrieved from https://www.who.int/reproductivehealth/topics/adolescence/sample_core_instruments.pdf.

Coe, R. (2002). It's the effect size, stupid: What effect size is and why it is important. Paper presented at the Annual Conference of the British Educational Research Association, University of Exeter, England, 12-14 September 2002. Retrieved from https://www.leeds.ac.uk/educol/documents/00002182.htm

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155-159. doi:10.1037//0033-2909.112.1.155

Creswell, J. W. (2009). *Research design: Qualitative, Quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage.

Denny-Smith, T., Bairan, A., & Page, M. C. (2006). A survey of female nursing students' knowledge, health beliefs, perceptions of risk, and risk behaviors regarding human papillomavirus and cervical cancer. *Journal of the American Association of Nurse Practitioners, 18*(2), 62-69. doi:10.1111/j.1745-7599.2006.00100.x

Earnshaw, V. A., Bogart, L. M., Dovidio, J. F., & Williams, D. R. (2013). Stigma and racial/ethnic HIV disparities: Moving toward resilience. *The American Psychologist, 68*(4), 225. doi.org/10.1037/a0032705

Einwalter, L. A., Ritchie, J. M., Ault, K. A., & Smith, E. M. (2005). Gonorrhea and chlamydia infection among women visiting family planning clinics: Racial variation in prevalence and predictors. *Perspectives on Sexual and Reproductive Health, 37*(3), 135-140. doi.org/10.1363/3713505

Eisenberg, M. E., Lust, K. A., & Garcia, C. M. (2014). Differences in sexual behaviors among unmarried sexually active students at 2- and 4year colleges. *Research in Nursing Health, 37(2),* 128-134. doi.org/10.1002/nur.21586

Epidemiology. (n.d.). Retrieved from http://www.dictionary.com/browse/epidemiology

Epstein, M., Bailey, J. A., Manhart, L. E., Hill, K. G., & Hawkins, J. D. (2014a). Sexual risk behavior in young adulthood: broadening the scope beyond early sexual initiation. *The Journal of Sex Research, 51*(7), 721-730. doi: 10.1080/00224499.2013.849652

Epstein, M., Bailey, J. A., Manhart, L. E., Hill, K. G., Hawkins, J. D., Haggerty, K. P., & Catalano, R. F. (2014b). Understanding the link between early sexual initiation and later sexually transmitted infection: test and replication in two longitudinal studies. *Journal of Adolescent Health*, *54*(4), 435-441. doi.org/10.1016/j.jadohealth.2013.09.016

Finer, L. B., & Philbin, J. M. (2013). Sexual initiation, contraceptive use, and pregnancy among young adolescents. *Pediatrics, 131*(5), 886-891. doi:10.1542/peds.2012-3495d

Fonner, V. A., Armstrong, K. S., Kennedy, C. E., O'Reilly, K. R., & Sweat, M. D. (2014). School based sex education and HIV prevention in low-and middle-income countries: A systematic review and meta-analysis. *PLoS ONE, 9*(3). doi:10.1371/journal.pone.0089692

Foster, C., Caravelis, C., & Kopak, A. (2014). National college health assessment measuring negative alcohol-related consequences among college

students. *American Journal of Public Health Research*, *2*(1), 1-5. doi:10.12691/ajphr-2-1-1

Frankfort-Nachmias, C. & Nachmias, D. (2008). *Research methods in the social sciences* (7th ed.). New York, NY: Worth.

Future of Sex Education. (2012). National Sexuality Education Standards: Core content and skills, K-12. Retrieved from http://www.futureofsexeducation.org

Gewirtzman, A., Bobrick, L., Connor, K., & Tyring, S. K. (2011). *Epidemiology of Sexually transmitted infections. Sexually Transmitted Infections and Sexually Transmitted Diseases,* 13–34. doi:10.1007/978-3-642-14663-3_2

Gill, T. S., Tuck, A., Gupta, S., Crowe, M., & Figueroa, J. (2013). A field test of optional unrelated question randomized response models: estimates of risky sexual behaviors. In *Topics from the 8th Annual UNCG Regional Mathematics and Statistics Conference* (pp. 135-146). New York, NY: Springer. doi:10.1007/978-1-4614-9332-7_14

Glanz, K., Rimer, B., & Lewis, F. (2002*). Theory, research and practice: Interrelationships*. San Francisco, CA: Jossey-Bass.

Green, E. C., & Murphy, E. (2014). Health belief model. *The Wiley Blackwell encyclopedia of health, illness, behavior, and society*. 766-769. doi: 10.1002/9781118410868.wbehibs410

Grello, C. M., Welsh, D. P., & Harper, M. S. (2006). No strings attached: The nature of casual sex in college students. *Journal of Sex Research*, *43*(3), 255-267. doi:10.1080/00224490609552324

Harling, G., Subramanian, S. V., Bärnighausen, T., & Kawachi, I. (2013). Socioeconomic disparities in sexually transmitted infections among young adults in the United States: examining the interaction between income and race/ethnicity. *Sexually Transmitted Diseases, 40*(7), 575. doi:10.1097/olq.0b013e31829529cf

Harrison, A., Cleland, J., Gouws, E., & Frohlich, J. (2005). Early sexual debut among young men in rural South Africa: heightened vulnerability to sexual risk?. *Sexually Transmitted Infections*, *81*(3), 259-261. doi:10.1136/sti.2004.011486

Healthy People. (2016). *National college health assessment*. Retrieved from https://www.healthypeople.gov/2020/data-source/national-college-health-assessment

Hendrickx, K., Phillips, H., & Avonts, D. (2008). Correlates of safe sex behaviour among low-educated adolescents of different ethnic origin in Antwerp, Belgium. *European Journal of Contraception & Reproductive Health Care*, *13*(2), 164-172. doi:10.1080/13625180802011385

Hittner, J. B., Owens, E. C., & Swickert, R. J. (2016). Influence of social settings on risky sexual behavior. SAGE Open, 6(1), 215824401662918. doi:10.1177/2158244016629187

Jaworski, B. C., & Carey, M. P. (2006). Development and psychometric evaluation of a self-administered questionnaire to measure knowledge of sexually transmitted diseases. *AIDS And Behavior, 11*(4), 557-574. doi:10.1007/s10461-006-9168-5

Kelly, G. (2003). *The psychology of personal constructs: Volume two: Clinical diagnosis*

and psychotherapy. New York, NY: Routledge.

Kirby, D. B., Laris, B. A., & Rolleri, L. A. (2007). Sex and HIV education programs: their impact on sexual behaviors of young people throughout the world. *Journal of Adolescent Health, 40*(3), 206-217. doi:10.1016/j.jadohealth.2006.11.143

Kowaleski-Jones, L., & Mott, F. L. (1998). Sex, Contraception and Childbearing Among Risky Youth: Do Different Factors Influence Males and Females? *Family Planning Perspectives*, *30*(4), 163-169. doi:10.2307/2991677

Lewis, M. A., Granato, H., Blayney, J. A., Lostutter, T. W., & Kilmer, J. R. (2012). Predictors of hooking up sexual behaviors and emotional reactions among US college students. *Archives of sexual behavior*, *41*(5), 1219-1229. doi:10.1007/s10508-011-9817-2

Lewis, M. A., Patrick, M. E., Litt, D. M., Atkins, D. C., Kim, T., Blayney, J. A., ... Larimer, M. E. (2014). Randomized controlled trial of a web-delivered personalized normative feedback intervention to reduce alcohol-related risky sexual behavior among college students. *Journal of Consulting and Clinical Psychology*, *82*(3), 429. doi:10.1037/a0035550

Lloyd, S. W., Ferguson, Y. O., Corbie-Smith, G., Ellison, A., Blumenthal, C., Council, B. J., … Akers, A. (2012). The role of public schools in HIV prevention: perspectives from African Americans in the rural south. *Aids Education Preview*, *24*(1), 41-53. doi:10.1521/aeap.2012.24.1.41

Lonczak, H. S., Abbott, R. D., Hawkins, J. D., Kosterman, R., & Catalano, R. F. (2002). Effects of the Seattle Social Development Project on sexual behavior, pregnancy,

birth, and sexually transmitted disease outcomes by age 21 years. *Archives of Pediatrics & Adolescent Medicine*, *156*(5), 438-447. doi:10.1001/archpedi.156.5.438

Lyons, H. A., Manning, W. D., Longmore, M. A., & Giordano, P. C. (2015). Gender and Casual Sexual Activity From Adolescence to Emerging Adulthood: Social and Life Course Correlates. *Journal Of Sex Research*, *52*(5), 543-557. doi:10.1080/00224499.2014.906032

Mair, C., Ponicki, W. R., & Gruenewald, P. J. (2016). Reducing risky sex among college students: prospects for context-specific interventions. *AIDS and Behavior*, *20*(1), 109-118. doi:10.1007/s10461-015-1147-2

McGuire, W. J. (1968). *Personality and attitude change: An information-processing theory.* La Jolla, CA: University of California, San Diego. doi:10.1016/b978-1-4832-3071-9.50013-1

Mehta, P., Sharma, M., & Lee, R. C. (2013). Designing and evaluating a health belief model-based intervention to increase intent of HPV vaccination among college males. *International Quarterly of Community Health Education*, *34*(1), 101-117. doi:10.2190/iq.34.1.h

Miller, J. D., Lynam, D., Zimmerman, R. S., Logan, T. K., Leukefeld, C., & Clayton, R. (2004). The utility of the Five Factor Model in understanding risky sexual behavior. *Personality and Individual Differences*, *36*, 1611-1626. doi:10.1016/j.paid.2003.06.009

Moilanen, K. L., Leary, J. M., Watson, S. M., & Ottley, J. (2015). Predicting Age of

Sexual Initiation Family-Level Antecedents in Three Ethnic Groups. *The Journal of Early Adolescence*, 38(1), 28–49. doi:10.1177/0272431615586462

Montanaro, E. A., & Bryan, A. D. (2014). Comparing theory-based condom interventions: health belief model versus theory of planned behavior. *Health Psychology*, *33*(10), 1251. doi:10.1037/a0033969

Moore, A. A., Overstreet, C., Kendler, K. S., Dick, D. M., Adkins, A., & Amstadter, A. B. (2017). Potentially traumatic events, personality, and risky sexual behavior in undergraduate college students. *Psychological Trauma: Theory, Research, Practice, And Policy, 9*(1), 105-112. doi:10.1037/tra0000168

Moore, E. (2013). Human immunodeficiency virus and chlamydia/gonorrhea testing among heterosexual college students: Who is getting tested and why do some not?. *Journal Of American College Health, 61*(4), 196-202. doi:10.1080/07448481.2013.789880

Moore, E. W., & Smith, W. E. (2012). What College Students Do Not Know: Where Are the Gaps in Sexual Health Knowledge? *Journal Of American College Health*, *60*(6), 436-442. doi:10.1080/07448481.2012.673521

Nogueira Avelar e Silva, R., Wijtzes, A., van de Bongardt, D., van de Looij-Jansen, P., Bannink, R., & Raat, H. (2016). Early Sexual Intercourse: Prospective Associations with Adolescents Physical Activity and Screen Time. *Plos ONE*, *11*(8), 1-16. doi:10.1371/journal.pone.0158648

Norfolk. (2017). *Facts about Norfolk*. Retrieved from https://www.norfolk.gov/index.aspx?NID=430

Norfolk Department of Health. (2012). *Data reports of STI rates among youth aged 14 to 18*. Retrieved from http://www.norfolk.gov/pub_health/ClinicalServices.asp#Communicable

Oswalt, S. B., Wagner, L. M., Eastman-Mueller, H. P., & Nevers, J. M. (2015). Pedagogy and content in sexuality education courses in US colleges and universities. *Sex Education*, *15*(2), 172-187. doi:10.1080/14681811.2014.991958

Oswalt, S. B., & Wyatt, T. J. (2013). Sexual health behaviors and sexual orientation in a US national sample of college students. *Archives of sexual behavior*, *42*(8), 1561-1572. doi:10.1007/s10508-012-0066-9

Parsons, J. T., Halkitis, P. N., Bimbi, D., & Borkowski, T. (2000). Perceptions of the benefits and costs associated with condom use and unprotected sex among late adolescent college students. *Journal of adolescence*, *23*(4), 377-391. doi:10.1006/jado.2000.0326

Paul-Ebhohimhen, V. A., Poobalan, A., & Teijlingen, E. R. (2008). A systematic review of school-based sexual health intervention to prevent STI/HIV in sub-Saharan Africa. *BioMed Central Public Health, 8*(4). doi: 10.1186/1471-2458-8-4

Pechmann, C. (2001). A comparison of health communication models: Risk learning versus stereotype priming. *Media Psychology*, *3*(2), 189-210. doi:10.1207/s1532785xmep0302_04

Pendergrast, R. A., DuRant, R. H., & Gaillard, G. L. (1992). Attitudinal and behavioral correlates of condom use in urban adolescent males. *Journal of Adolescent Health*, *13*(2), 133-139. doi:10.1016/1054-139x(92)90080-u

Pendergrast, R. A., DuRant, R. H., & Gaillard, G. L. (1992). Sexual Attitudes and Behaviors Questionnaire [Database record]. Retrieved from PsycTESTS. doi: 10.1037/t09582-000

Rosenstock, I. M. (1990). The health belief model: explaining health behavior through expectancies. In K. Glanz, F. M. Lewis, & B. K. Rimer (Eds.), *The Jossey-Bass health series. Health behavior and health education: Theory, research, and practice* (pp. 39-62). San Francisco, CA: Jossey-Bass.

Saraçoğlu, G. V., Erdem, İ., Doğan, S., & Tokuç, B. (2014). Youth Sexual Health: Sexual Knowledge, Attitudes, and Behavior Among Students at a University in Turkey. *Archives Of Neuropsychiatry / Noropsikiatri Arsivi, 51*(3), 222-228. doi:10.4274/npa.y6768

Schiavo, R. (2007). *Health communication from theory to practice*. San Francisco, CA: Jossey-Bass.

Sexual behavior. (2002). *McGraw-Hill Concise Dictionary of Modern Medicine*. Retrieved http://medical-dictionary.thefreedictionary.com/sexual+behavior

Sexual intercourse. (n.d.). Retrieved from http://www.dictionary.com/browse/sexual-intercourse

Shin, K. R., Park, H., & Cha, C. (2011). Sex education during the school-aged years influences sexual attitudes and sexual health in college: A comparative study from Korea. *Nursing & Health Sciences, 13*(3), 328-334. doi:10.1111/j.1442-2018.2011.00622.x

Skinner, C. S., Tiro, J., & Champion, V. L. (2015). *The health belief model. Health*

behavior: theory, research, and practice. 5th ed. San Francisco, CA: Jossey-Bass, 75-94.

Stanger-Hall, K. F., & Hall, D. W. (2011). Abstinence-only education and teen pregnancy rates: Why we need comprehensive sex education in the U.S. *PLosOne, 6*(10), 1-11. doi:10.1371/journal.pone.0024658

State Council of Higher Education for Virginia. (2017). *Student outcomes: Reports and resources*. Retrieved from http://research.schev.edu

Turchik, J. A., & Garske, J. P. (2007). Sexual Risk Survey. *Psyctests.* doi:10.1037/t03380-000

Turchik, J. A., & Garske, J. P. (2009). Measurement of Sexual Risk Taking Among College Students. *Archives Of Sexual Behavior, 38*(6), 936-948. doi:10.1007/s10508-008-9388-z

Turchik, J. A., Walsh, K., & Marcus, D. K. (2015). Confirmatory validation of the factor structure and reliability of the sexual risk survey in a large multiuniversity sample of U.S. students. *International Journal Of Sexual Health, 27*(2), 93-105. doi:10.1080/19317611.2014.944295

Turner, C. F., Ku, L., Rogers, S. M., Lindberg, L. D., Pleck, J. H., & Sonenstein, F. L. (1998). Adolescent Sexual Behavior, Drug Use, and Violence: Increased Reporting with Computer Survey Technology. *Science 280,* 867-873. doi:10.1126/science.280.5365.867

United States Census Bureau. (2017). *Quick Facts: Virginia; United States*. US Census Quick Facts Database. Retrieved from

https://www.census.gov/quickfacts/fact/table/va,US/PST045217

US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for HIV, STD and TB Prevention (NCHSTP), & Division of STD/HIV Prevention. (2017). *Sexually Transmitted Disease Morbidity for selected STDs by age, race/ethnicity and gender 1996-2014.* CDC WONDER Online Database. Retrieved from http://wonder.cdc.gov/std-race-age.html

VanOss Marín, B., Gómez, C. A., Tschann, J. M., & Gregorich, S. E. (1997). Sexual Attitudes and Behaviors Survey [Database record]. doi: 10.1037/t15863-000

Virginia Board of Education. (2012). *Education and standards for sexual education with the public schools*. Retrieved from http://ww.doe.virginia.gov/

Virginia Board of Education. (2016). *Family life education and standards of Learning for Virginia public schools*. Retrieved from http://ww.doe.virginia.gov/

Virginia Department of Health. (2012). *Data reports of STD/ HIV incidence among individuals aged 14 to 24 years.* Retrieved from http://www.vdh.state.va.us/

Virginia Department of Health. (2014). *Virginia STD surveillance report*. Retrieved from http://www.vdh.virginia.gov/disease-prevention/std-annual-reports/

Virginia Department of Health. (2015). *Overview of sexually transmitted diseases*. Retrieved from http://www.vdh.state.va.us/

Virginia Department of Health. (2016). *Virginia STD surveillance report*. Retrieved from http://www.vdh.virginia.gov/disease-prevention/std-annual-reports/

Wilton, L., Palmer, R. T., & Maramba, D. C. (Eds.). (2014). *Understanding HIV and STI*

prevention for college students (Vol. 5). New York, NY: Routledge. doi:10.4324/9781315884387

Womens Health. (2016). *A-Z health topics*. Retrieved from https://www.womenshealth.gov/a-z-topics#s

World Health Organization. (2016). *Sexually transmitted infections (STIs*). Retrieved from http://www.who.int/mediacentre/factsheets/fs110/en/

Wright, P. J., Randall, A. K., & Grace Hayes, J. (2012). Predicting the condom assertiveness of collegiate females in the United States from the expanded health belief model. *International Journal of Sexual Health*, *24*(2), 137-153. doi:10.1080/19317611.2012.661396

Zhang, F., & Gou, J. (2016). A P-value model for theoretical power analysis and its applications in multiple testing procedures. *BMC Medical Research Methodology*, *16*(1), 135. doi:10.1186/s12874-016-0233-0

Zhang, Q., Kazi, H., & Gupta, S. (2014). Modeling Risky Sexual Behavior Among College Students: Predictors of STD. In *Collaborative Mathematics and Statistics Research* (pp. 75-79). Cham, Switzerland: Springer. doi:10.1007/978-3-319-11125-4_8

Appendix A: Pilot Study- Modified Behavior Survey

Pilot Study-Modified Sexual Behavior and Education Survey

This survey is about health behavior. It has been developed so you can tell the researcher what you do that may affect your health. The information you give will be used to improve health education for young people like yourself.

DO NOT include your name on this survey. The answers you give will be kept private. No one will know what you write. Answer the questions based on what you really do.

Completing the survey is voluntary. Whether or not you answer the questions will not affect your student status. If you are not comfortable answering a question, just leave it blank.

The questions that ask about your background will be used only to describe the types of students completing this survey. The information will not be used to find out your name. No names will ever be reported.

Make sure to read every question. Select the answer that best describes your answer. When you are finished, follow the instructions on the screen.

Thank you very much for your help.

* 1. How old are you?

- ◯ 18 years old
- ◯ 19 years old
- ◯ 20 years old
- ◯ 21 years old
- ◯ 22 years old
- ◯ 23 years old
- ◯ 24 years
- ◯ 25 years or older

2. What is your sex?

- ◯ Female
- ◯ Male

3. What is your class standing?

- ◯ Freshman
- ◯ Sophomore
- ◯ Junior
- ◯ Senior
- ◯ Graduate Student
- ◯ Other

Pilot Study-Modified Sexual Behavior and Education Survey

4. Which of the following best describes your race? (Select only one response.)

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or other Pacific Islander
- White
- Hispanic or Latino

5. What is your marital status?

- Never been married
- Married
- Unmarried
- Separated
- Divorced
- Widowed
- Domestic Partner

6. Which of the following best describes you?

- Heterosexual (straight)
- Gay or lesbian
- Bisexual
- Not sure

7. Have you ever had any form of sexual intercourse?

- Yes
- No

Pilot Study-Modified Sexual Behavior and Education Survey

8. How old were you when you had sexual intercourse for the first time?

- 11 years old or younger
- 12 years old
- 13 years old
- 14 years old
- 15 years old
- 16 years old
- 17 years old or older

9. During your life, with how many people have you had sexual intercourse?

- 1 person
- 2 people
- 3 people
- 4 people
- 5 people
- 6 or more people

10. During the past 3 months, with how many people did you have sexual intercourse?

- I have had sexual intercourse, but not during the past 3 months
- 1 person
- 2 people
- 3 people
- 4 people
- 5 people
- 6 or more people

Pilot Study-Modified Sexual Behavior and Education Survey

11. During the past 30 days, how many times did you have sexual intercourse?

- 0 times
- 1 time
- 2 or 3 times
- 4 to 9 times
- 10 to 19 times
- 20 or more times

12. How often do you or your partner use a condom?

- Never used a condom
- Rarely used a condom
- Sometimes used a condom
- Most of the time used a condom
- Always used a condom

13. How many times have you given or received (oral sex on a man or woman) without a condom?

- 0 times
- 1-2 times
- 3-4 times
- 5 or more times

14. How many times have you had anal sex without a condom?

- 0 times
- 1-2 times
- 3-4 times
- 5 or more times

15. How many times have you gone out to bars/parties/social events with the intent of "hooking up" and having sex with someone?

- A. 0 times
- B. 1-2 times
- C. 3-4 times
- D. 5 or more times

16. How many times have you or your partner used alcohol or drugs before or during sex?

- 0 times
- 1 2 times
- 3-4 times
- 5 or more times

17. How many times have you had sex with a new partner before discussing sexual history, IV drug use, disease status and other current sexual partners?

- 0 times
- 1- 2 times
- 3-4 times
- 5 or more times

18. Have you ever had sex with someone who you knowingly had tested positive for a Sexually Transmitted Infection (STIs) (such as chlamydia, gonorrhea, or syphilis) or HIV?

- Yes
- No

19. How many times (that you know of) have you had sex with someone who was also engaging in sex with others during the same time period?

- 0 times
- 1-2 times
- 3-4 times
- More than 5 times

20. Have you ever been tested for an STI?

- Yes
- No

21. Have you ever been diagnosed with an STI?

- Yes
- No

22. Have you ever had your blood tested for the AIDS virus/HIV infection?

- Yes
- No
- Not sure

23. How likely do you feel you are to contract a STI if you do not use a condom while having sexual intercourse?

- Impossible
- Likely
- Very Likely
- Very certain to Likely get one
- Unlikely

24. Have you ever received any form of sexual education prior to attending college?

- Yes
- No
- Not sure

25. Have you ever been taught about STIs in any of your college classes?

- Yes
- No
- Not sure

26. Do you think sexual education courses should be part of the college curriculum?

- Yes
- No
- Not sure

27. Looking back at the previous questions, were there any questions that you personally feel were not clear enough to give your honest response? (Please list question # and reason)

28. Also looking back at the previous questions, were there any questions that you feel were culturally sensitive or not relative to the purpose of this survey? (Please list question # and reason)

Appendix B: Final Study- Modified Behavior Survey

Modified Sexual Behavior and Education Survey

Survey

This survey is about health behavior. It has been developed so you can tell the researcher what you do that may affect your health. The information you give will be used to improve health education for young people like yourself.

DO NOT include your name on this survey. The answers you give will be kept private. No one will know what you write. Answer the questions based on what you really do.

Completing the survey is voluntary. Whether or not you answer the questions will not affect your student status. If you are not comfortable answering a question, just leave it blank.

The questions that ask about your background will be used only to describe the types of students completing this survey. The information will not be used to find out your name. No names will ever be reported.

Make sure to read every question. Select the answer that best describes your answer. When you are finished, follow the instructions on the screen.

Thank you very much for your help.

* 1. How old are you?

- 18 years old
- 19 years old
- 20 years old
- 21 years old
- 22 years old
- 23 years old
- 24 years
- 25 years or older

* 2. What is your sex?

- Female
- Male

* 3. What is your class standing?

- Freshman
- Sophomore
- Junior
- Senior
- Graduate Student
- Other

* 4. Which of the following best describes your race? (Select only one response.)

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or other Pacific Islander
- White
- Hispanic or Latino

* 5. What is your marital status?

- Never been married
- Married
- Unmarried
- Separated
- Divorced
- Widowed
- Domestic Partner

* 6. Which of the following best describes you?

- Heterosexual (straight)
- Gay or lesbian
- Bisexual
- Not sure

* 7. Have you ever had any form of sexual intercourse?

- Yes
- No

* 8. How old were you when you had sexual intercourse for the first time?

- 11 years old or younger
- 12 years old
- 13 years old
- 14 years old
- 15 years old
- 16 years old
- 17 years old or older

* 9. During your life, with how many people have you had sexual intercourse?

- 1 person
- 2 people
- 3 people
- 4 people
- 5 people
- 6 or more people

* 10. During the past 3 months, with how many people did you have sexual intercourse?

- I have had sexual intercourse, but not during the past 3 months
- 1 person
- 2 people
- 3 people
- 4 people
- 5 people
- 6 or more people

* 11. During the past 30 days, how many times did you have sexual intercourse?

- 0 times
- 1 time
- 2 or 3 times
- 4 to 9 times
- 10 to 19 times
- 20 or more times

* 12. How often do you or your partner use a condom?

- Never used a condom
- Rarely used a condom
- Sometimes used a condom
- Most of the time used a condom
- Always used a condom

* 13. How many times have you given or received (oral sex on a man or woman) without a condom?

- 0 times
- 1-2 times
- 3-4 times
- 5 or more times

* 14. How many times have you had anal sex without a condom?

- 0 times
- 1-2 times
- 3-4 times
- 5 or more times

* 15. How many times have you gone out to bars/parties/social events with the intent of "hooking up" and having sex with someone?

- A. 0 times
- B. 1-2 times
- C. 3-4 times
- D. 5 or more times

* 16. How many times have you or your partner used alcohol or drugs before or during sex?

- 0 times
- 1-2 times
- 3-4 times
- 5 or more times

* 17. How many times have you had sex with a new partner before discussing sexual history, IV drug use, disease status and other current sexual partners?

- 0 times
- 1- 2 times
- 3-4 times
- 5 or more times

* 18. Have you ever had sex with someone who you knowingly had tested positive for a Sexually Transmitted Infection (STIs) (such as chlamydia, gonorrhea, or syphilis) or HIV?

- Yes
- No

* 19. How many times (that you know of) have you had sex with someone who was also engaging in sex with others during the same time period?

- 0 times
- 1-2 times
- 3-4 times
- More than 5 times

* 20. Have you ever been tested for an STI?

- Yes
- No

* 21. Have you ever been diagnosed with an STI?

- Yes
- No

* 22. Have you ever had your blood tested for the AIDS virus/HIV infection?

- Yes
- No
- Not sure

* 23. How likely do you feel you are to contract a STI if you do not use a condom while having sexual intercourse?

- Impossible
- Very Likely
- Unlikely
- Likely
- Very certain to Likely get one

* 24. Have you ever received any form of sexual education prior to attending college?

- Yes
- No
- Not sure

* 25. Have you ever been taught about STIs in any of your college classes?

- Yes
- No
- Not sure

* 26. Do you think sexual education courses should be part of the college curriculum?

- Yes
- No
- Not sure

Appendix C: Descriptive Statistics and Multinomial Regression Tables

Table C1

Descriptive Statistics of Sexual Behavior Variables by Sexual Education (n = 656)

	Sexual education							
	Prior to college (Yes)		Prior to college (No)		During college (Yes)		During college (No)	
	n (%)	95% CI	*n* (%)	95% CI	*n* (%)	95% CI	*n* (%)	95% CI
Characteristics	607 (92.5)	90.2-94.4	42 (6.4)	4.7-8.6	190 (29.0)	25.5-32.5	444 (67.7)	64.1-71.3
Sexual intercourse								
Yes	486 (94.7)	92.9-96.4	27 (5.3)	3.6-7.0	157 (30.6)	27.1-34.1	356(69.4)	65.9-72.9
No	121 (84.6)	81.8-87.4	22 (15.4)	12.6-18.2	33 (23.1)	19.9-26.3	110 (76.9)	73.7-80.1
Age of first sexual intercourse								
13 years old or younger	29 (96.7)	95.3-98.1	1 (3.3)	1.9-4.7	14 (46.7)	42.4-51.0	16 (53.3)	49.0-57.6
14-16 years old	223(94.5)	92.8-96.2	13 (5.5)	3.8-7.2	67 (28.4)	24.5-32.3	169 (71.6)	67.7-75.5
17 years old or older	234 (94.7)	92.9-96.4	13 (5.3)	3.6-7.0	76 (30.8)	26.6-34.6	171 (69.2)	65.2-73.2
Number of sex partners								
1 person	110 (92.4)	90.4-94.4	9 (7.5)	5.5-9.5	37 (31.1)	27.1-35.1	82 (68.9)	64.9-72.9
2-4 people	165 (94.3)	92.5-96.1	10 (5.7)	3.9-7.5	53 (30.3)	26.3-34.3	122 (69.7)	65.7-73.7
5 or more people	211 (96.3)	94.9-97.7	8 (3.7)	2.3-5.1	67 (30.6)	26.6-34.6	152 (68.4)	64.4-72.4
Sex partners in past 3 months								
No sex in past 3 months	83 (95.4)	93.8-97.0	4 (4.6)	3.0-6.2	27 (31.0)	27.0-35.0	60 (68.9)	64.9-72.9
1 person	302 (94.7)	92.9-96.4	17 (5.3)	3.6-7.0	107 (33.5)	29.4-37.6	212 (66.4)	62.3-70.5
2 or more people	101 (94.4)	92.6-96.2	6 (5.6)	3.8-7.4	23 (21.5)	17.9-25.1	84 (78.5)	74.9-82.1
Sexual intercourse in 30 days								
0-3 times	250 (95.8)	94.3-97.3	11 (4.2)	2.7-5.7	80 (30.7)	26.7-34.7	181 (69.4)	65.4-73.4
4 to 9 times	124 (94.7)	92.9-96.4	7 (5.4)	3.7-7.1	43 (32.8)	28.7-36.9	88 (67.2)	63.1-71.3
10 or more times	112 (92.6)	90.6-94.6	9 (7.5)	5.5-9.5	34 (28.1)	24.2-32.0	87 (71.9)	68.0-75.8

(table continues)

	Sexual Education							
	Prior to College (Yes)		Prior to College (No)		During College (Yes)		During College (No)	
Characteristics	*n* (%)	95% CI	*n* (%)	95% CI	*n* (%)	95% CI	*n* (%)	95% CI
Condom use								
Never used a condom	141 (92.2)	90.2-94.3	12 (7.8)	5.8-9.9	48 (31.4)	27.4-35.4	105 (68.7)	64.7-72.7
Sometimes used a condom	235 (95.9)	94.4-97.4	10 (4.1)	2.6-5.6	74 (30.2)	26.2-34.2	171 (69.8)	65.8-73.8
Always used a condom	110 (95.7)	94.2-97.3	5 (4.3)	2.8-5.9	35 (30.4)	26.4-34.4	80 (69.6)	65.6-73.6
Oral sex no condom								
0 times	28 (90.3)	88.0-92.6	3 (9.7)	7.4-12.0	9 (29.0)	25.1-32.9	22 (71.0)	65.6-73.6
1-4 times	71 (93.4)	91.5-95.3	5 (6.6)	4.7-8.5	28 (36.8)	32.6-41.0	48 (63.2)	59.0-67.4
5 or more times	387 (95.3)	93.7-96.9	19 (4.6)	3.0-6.2	120 (29.6)	25.7-35.6	286 (70.4)	66.5-74.4
Anal sex no condom								
0 times	352 (95.4)	92.8-96.2	17 (4.6)	3.0-6.2	109 (29.5)	25.6-33.5	260 (70.5)	66.6-74.5
1-4 times	92 (92.0)	89.9-94.1	8 (8.0)	5.9-10.1	32 (32.0)	28.0-36.0	68 (68.0)	64.0-72.0
5 or more times	42 (95.5)	93.9-97.1	2 (4.5)	2.9-6.1	16 (36.4)	32.2-40.6	28 (63.6)	59.4-67.8
Hooking up								
0 times	344 (94.0)	92.2-95.8	22 (6.0)	4.2-7.8	111 (30.3)	26.3-34.3	255 (69.7)	65.7-73.7
1-4 times	87 (95.6)	94.0-97.2	4 (4.4)	2.8-6.0	23 (25.3)	21.5-29.1	68 (74.7)	70.9-78.5
5 or more times	55 (98.2)	97.2-99.2	1 (1.8)	0.8-2.8	23 (41.1)	36.8-45.4	33 (58.9)	54.6-63.2
Sex with alcohol/drugs								
0 times	126 (92.6)	90.6-94.6	10 (7.4)	5.4-9.4	42 (30.9)	26.9-34.9	94 (69.1)	65.1-73.1
1-4 times	192 (94.6)	92.9-96.3	11 (5.4)	3.7-7.1	56 (27.6)	23.7-31.5	147 (72.4)	68.5-76.3
5 or more times	168 (96.6)	95.2-98.0	6 (3.4)	2.0-4.8	59 (33.9)	29.8-38.0	115 (66.1)	62.0-70.2

(table continues)

	Sexual Education							
	Prior to College (Yes)		Prior to College (No)		During College (Yes)		During College (No)	
Characteristics	*n* (%)	95% CI	*n* (%)	95% CI	*n* (%)	95% CI	*n* (%)	95% CI
Sex with new partner w/o discussing history								
0 times	222 (94.1)	92.3-95.9	14 (5.9)	4.1-7.7	69 (29.2)	25.3-33.1	167 (70.8)	66.9-74.7
1-4 times	185 (95.9)	94.4-97.4	8 (4.1)	2.6-5.6	62 (32.1)	28.1-36.1	131 (67.9)	63.9-71.9
5 or more times	79 (94.0)	92.2-95.8	5 (6.0)	4.2-7.8	26 (31.0)	27.0-35.0	58 (69.0)	65.0-73.0
Sex with partner and STI diagnosis in lifetime								
Yes	8 (72.7)	69.3-76.1	3 (27.3)	23.9-30.1			11 (100.0)	100.0-100.0
No	478 (95.2)	93.6-96.8	24 (4.8)	3.2-6.4	157 (31.3)	27.3-35.3	345 (66.9)	62.8-71.0
Multiple sex partners								
0 times	271 (93.4)	91.5-95.3	19 (6.6)	4.7-8.5	86 (29.7)	25.8-33.7	204 (70.3)	66.4-74.3
1-4 times	182 (96.8)	95.5-98.2	6 (3.2)	1.9-4.6	57 (30.3)	26.3-34.3	131 (69.7)	65.7-73.7
5 or more times	33 (94.3)	91.5-95.3	2 (5.7)	3.9-7.5	14 (40.0)	35.8-44.2	21 (60.0)	55.8-64.2

Table C2

Multinomial Regression Analysis of Sexual Behavior by Sexual Education Categories (n = 656)

	Sexual intercourse	Age of first sexual intercourse			Number of sex partners		
	Yes	13 years old or younger	14-16 years old	17 years old or older	1 person	2-4 people	5 or more people
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Age							
18 - 19 years of age	0.5 (0.3-0.7)	0.8 (0.1-4.4)	1.6 (0.8-3.7)	1.2 (0.2-6.8)	1.2 (0.4-3.3)	2.2 (0.9-5.2)	0.8 (0.3-2.4)
20- 21 years of age	0.7 (0.4-1.2)	0.2 (0.1-0.7)*	0.8 (0.5-1.4)	4.8 (1.4-16.7)	1.9 (1.0-3.8)	2.3 (1.3-4.2)**	0.5 (0.3-1.0)
22-24 years of age	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex							
Female	6.5 (4.5-9.6)	1.9 (0.1-3.6)	1.2 (0.1-2.1)	4.0 (1.7-9.1)**	1.1 (0.6-1.9)	1.3 (0.8-2.2)	1.1 (0.7-1.8)
Male	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Race							
White	1.2 (0.7-2.1)	0.4 (0.1-1.5)	0.8 (0.4-1.4)	2.4 (0.7-8.7)	1.8 (0.8-3.7)	1.2 (0.7-2.3)	0.6 (0.3-1.2)
Black/African American	1.1 (0.6-2.1)	1.7 (0.5-5.8)	1.0 (0.5-1.8)	0.6 (0.2-2.0)	0.8 (0.4-1.7)	0.8 (0.4-1.7)	1.2 (0.5-2.7)
Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Class Status							
Freshmen	0.5 (0.3-0.8)	1.0 (0.1-6.5)	0.7 (0.3-1.7)	1.0 (0.2-7.1)	2.0 (0.7-6.0)	1.0 (0.4-2.6)	0.5 (0.2-1.5)
Sophomore	0.7 (0.4-1.2)	1.5 (0.3-6.7)	0.8 (0.4-1.6)	0.7 (0.1-2.9)	1.2 (0.5-2.8)	0.6 (0.3-1.2)	0.8 (0.4-1.9)
Junior	0.9 (0.5-1.5)	1.2 (0.4-3.9)	0.9 (0.5-1.4)	0.8 (0.3-2.4)	1.0 (0.5-2.0)	0.7 (0.4-1.3)	1.0 (0.5-1.9)
Senior	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

(table continues)

	Sexual intercourse	Age of first sexual intercourse			Number of sex partners		
	Yes	13 years old or younger	14-16 years old	17 years old or older	1 person	2-4 people	5 or more people
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Marital Status							
Never Married	0.2 (0.1-0.8)	0.5 (0.1-1.8)	0.8 (0.4-1.8)	2.1 (0.6-7.9)	2.9 (0.8-10.5)	1.1 (0.5-2.5)	0.3 (0.1-1.2)
Married/Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sexual Orientation							
Heterosexual	2.0 (0.7-5.7)	0.7 (0.1-7.5)	1.8 (0.3-4.6)	1.4 (0.1-14.2)	0.8 (0.1-5.1)	0.4 (0.1-1.9)	1.2 (0.2-7.9)
Gay/ Lesbian/ Bisexual	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex Ed Prior to College							
Yes	5.3 (1.2 -24.2)*	1.0 (0.6-1.7)	3.7 (0.7-20.4)	7.7 (0.9-69.9)	3.6 (0.4-33.0)	3.6 (0.4-33.0)	7.0 (0.8-63.1)
No	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex Ed During College							
Yes	1.7 (0.6-4.8)	2.5 (0.3-23.1)	1.2 (0.4-3.6)	2.8 (0.8-9.7)	1.4 (0.4-4.8)	1.6 (0.5- 5.4)	2.4 (0.7-8.6)
No	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Table C3

Multinomial Regression Analysis of Sexual Behavior by Sexual Education Categories (n = 656)

	Sex partners in past 3 months			Sexual intercourse in 30 days		
	No sex in past 3 months	1 person	2 or more people	0-3 times	4 to 9 times	10 or more times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Age						
18-19 years of age	0.6 (0.2-2.2)	0.5 (0.2-1.3)	1.6 (0.5-5.8)	0.5 (0.2-1.4)	0.4 (0.1-1.2)	2.0 (0.7-5.2)
20-21 years of age	0.9 (0.4-2.1)	0.7 (0.3-1.3)	1.1 (0.5-2.6)	0.6 (0.3-1.3)	0.7 (0.3-1.5)	1.6 (0.8-3.1)
22-24 years of age	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex						
Female	2.2 (1.2-3.9)**	3.5 (0.0-7.2)	1.7 (0.0-2.9)	4.6 (0.3-82.0)	1.2 (0.7-2.1)	0.2 (0.1-3.9)
Male	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Race						
White	1.0 (0.4-2.6)	1.0 (0.5-2.1)	1.0 (0.4-2.6)	1.2 (0.6-2.3)	1.1 (0.5-2.4)	0.9 (0.4-1.7)
Black/African American	0.7 (0.3-1.9)	0.4 (0.2-0.9)	1.4 (0.5-3.8)	2.5 (1.2-5.3)**	1.6 (0.7-3.7)	0.4 (0.2-0.9)*
Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Class status						
Freshmen	0.6 (0.1-2.3)	1.1 (0.4-3.3)	1.7 (0.4-6.8)	0.9 (0.3-2.4)	1.1 (0.4-3.6)	1.2 (0.4-3.3)
Sophomore	0.7 (0.3-2.1)	0.8 (0.4-1.9)	1.4 (0.5-3.8)	0.8 (0.3-1.7)	0.9 (0.4-2.2)	1.3 (0.6-3.0)
Junior	1.1 (0.4-2.5)	0.9 (0.5-1.9)	0.9 (0.4-2.3)	1.0 (0.5-2.0)	0.9 (0.4-1.8)	1.0 (0.5-1.9)
Senior	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

(table continues)

	Sex partners in past 3 months			Sexual intercourse in 30 days		
	No sex in past 3 months	1 person	2 or more people	0-3 times	4 to 9 times	10 or more times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Marital status						
Never married	0.2 (0.0-0.8)	1.6 (0.7-3.7)	0.3 (0.1-1.7)	3.8 (1.5-9.7)**	1.5 (0.6-3.9)	0.3 (0.1-0.7)
Married/Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sexual orientation						
Heterosexual	0.1 (0.0-1.4)	3.5 (0.5-27.3)	4.4 (0.7-27.5)	0.5 (0.1-2.7)	1.1 (0.7-1.6)	1.9 (0.4-9.4)
Gay/Lesbian/Bisexual	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex ed prior to college						
Yes	1.0 (0.7-1.4)	4.9 (0.9-27.6)	3.3 (0.4-30.4)	3.0 (2.9-3.1)***	1.4 (2.1-8.8)***	7.3 (3.4-1.6)***
No	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex ed during college						
Yes	1.6 (0.4-6.9)	1.6 (0.4-7.2***	1.9 (0.7-5.8)	1.1 (0.4-3.2)	2.6 (0.6-11.2)	0.9 (0.6-1.4)
No	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Table C4

Multinomial Regression Analysis of Sexual Behavior by Sexual Education Categories (n = 656)

	Condom use			Oral sex with no condom		
	Never used a condom	Sometimes use a condom	Always used a condom	0 times	1-4 times	5 or more times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Age						
18-19 years of age	0.5 (0.2-1.7)	1.6 (0.6-4.5)	1.8 (0.6-5.7)	2.6 (0.5-13.7)	0.8 (0.3-2.7)	0.4 (0.1-2.0)
20-21 years of age	0.6 (0.3-1.3)	1.3 (0.7-2.5)	1.6 (0.8-3.4)	0.9 (0.3-2.7)	1.2 (0.6-2.5)	1.2 (0.4-3.1)
22-24 years of age	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex						
Female	2.2 (1.2-3.9)**	2.2 (0.1-36.3)	1.7 (0.0-2.9)	0.1 (0.0-1.0)*	1.1 (0.5-2.1)	0.9 (0.5-1.7)
Male	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Race						
White	0.6 (0.2-1.3)	0.7 (0.4-1.6)	1.8 (0.8-4.1)	1.0 (0.3-3.5)	0.5 (0.2-1.1)	1.1 (0.3-3.9)
Black/African American	0.7 (0.3-1.8)	1.0 (0.4-2.2)	1.4 (0.6-3.4)	2.1 (0.6-8.2)	1.0 (0.5-2.2)	0.5 (0.1-1.8)
Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Class status						
Freshmen	0.8 (0.2-2.9)	0.5 (0.2-1.4)	1.2 (0.3-4.1)	0.5 (0.1-2.9)	1.6 (0.5-5.3)	2.1 (0.3-12.4)
Sophomore	1.6 (0.6-4.1)	0.8 (0.4-1.9)	0.6 (0.2-1.6)	0.5 (0.1-2.2)	0.7 (0.3-1.7)	2.0 (0.4-9.2)
Junior	1.2 (0.6-2.6)	0.9 (0.4-1.7)	0.8 (0.4-1.7)	1.4 (0.5-3.9)	0.7 (0.3-1.4)	0.7 (0.3-2.0)
Senior	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Marital status						
Never married	0.5 (0.2-1.5)	0.7 (0.2-1.9)	2.0 (0.6-6.3)	2.5 (0.3-19.9)	2.7 (0.6-12.1)	0.4 (0.1-3.2)
Married/Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

(table continues)

	Condom use			Oral sex with no condom		
	Never used a condom	Sometimes use a condom	Always used a condom	0 times	1-4 times	5 or more times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Sexual orientation						
Heterosexual	5.2 (0.5-50.4)	1.8 (0.5-7.1)	0.2 (0.0-1.8)	0.6 (0.2-1.6)	0.8 (0.2-3.9)	2.1 (0.7-6.5)
Gay/Lesbian/Bisexual	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex ed prior to college						
Yes	4.7 (0.5-42.3)	3.9 (0.7-21.5)*	0.3 (0.1-0.7)	0.6 (0.2-1.8)	0.4 (0.2-1.0)	4.3 (0.9-19.3)
No	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex ed during college						
Yes	1.7 (0.5-6.2)	4.5 (1.1-19.0)*	0.8 (0.2-2.5)	0.5 (0.1-2.6)	1.7 (0.4-7.4)	2.2 (0.7-6.4)
No	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Table C5

Multinomial Regression Analysis of Sexual Behavior by Sexual Education Categories (n = 656)

	Anal sex with no condom			Hooking up		
	0 times	1-4 times	5 or more times	0 times	1-4 times	5 or more times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Age						
18-19 years of age	0.8 (0.2-3.2)	0.6 (0.1-2.6)	1.2 (0.3-4.5)	0.5 (0.2-1.9)	0.2 (0.1-0.9)*	1.9 (0.5-6.5)
20-21 years of age	1.2 (0.5-3.0)	0.9 (0.3-2.6)	0.8 (0.3-2.0)	2.2 (0.9-2.1)	1.0 (0.4-2.7)	0.5 (0.2-1.1)
22-24 years of age	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex						
Female	4.1 (2.7-6.3)	1.8 (0.8-3.9)	0.7 (0.4-1.6)	1.1 (0.0-2.6)	1.2 (0.6-2.5)	1.0 (0.6-1.8)
Male	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Race						
White	1.2 (0.5-3.1)	1.3 (0.5-3.8)	0.8 (0.3-2.1)	2.1 (0.9-5.0)	1.5 (0.6-4.1)	0.5 (0.0-1.1)
Black/ African American	1.2 (0.4-3.4)	0.8 (0.2-2.7)	0.8 (0.3-2.4)	2.6 (1.0-6.6)	1.1 (0.4-3.4)	0.4 (0.2-1.0)
Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Class status						
Freshmen	1.0 (0.2-4.7)	1.1 (0.2-6.3)	1.0 (0.2-4.3)	3.1 (0.7-12.9)	6.4 (1.2-34.3)*	0.3 (0.1-1.3)
Sophomore	0.8 (0.3-2.6)	1.5 (0.4-5.4)	1.2 (0.4-3.9)	1.2 (0.4-4.0)	2.9 (0.8-11.0)	0.8 (0.3-2.6)
Junior	0.6 (0.2-1.3)	0.9 (0.3-2.3)	1.8 (0.7-4.4)	0.6 (0.2-1.3)	0.9 (0.3-2.4)	1.8 (0.8-4.2)
Senior	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Marital status						
Never married	1.4 (0.4-4.9)	1.6 (0.4-6.4)	0.7 (0.2-2.3)	1.5 (0.5-4.7)	0.7 (0.2-2.3)	0.7 (0.2-2.1)
Married/Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

(table continues)

	Anal sex with no condom			Hooking up		
	0 times	1-4 times	5 or more times	0 times	1-4 times	5 or more times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Sexual orientation						
Heterosexual	1.3 (0.1-12.0)	3.1 (0.2-55.0)	0.7 (0.1-6.7)	0.3 (0.0-2.7)	2.6 (0.0-12.2)	3.9 (0.4-41.5)
Gay/Lesbian/Bisexual	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex ed prior to college						
Yes	5.8 (1.1-32.2)*	3.0 (0.3-27.7)	0.3 (0.1-1.3)	5.7 (1.0-31.4)*	2.9 (0.3-26.2)	0.1 (0.0-1.0)
No	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex ed during college						
Yes	1.3 (0.5-3.7)	5.8 (0.7-51.1)	0.5 (0.3-1.1)	1.4 (0.5-4.0)	4.2 (0.5-37.1)	4.2 (0.5-371)
No	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Table C6

Multinomial Regression Analysis of Sexual Behavior by Sexual Education Categories (n = 656)

	Sex with alcohol/drugs			Sex with new partner without sexual history		
	0 times	1-4 times	5 or more times	0 times	1-4 times	5 or more times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Age						
18-19 years of age	1.0 (0.4-2.6)	1.0 (0.4-2.5)	1.0 (0.4-2.8)	1.4 (0.5-4.3)	3.2 (1.0-10.0)*	0.7 (0.2-2.2)
20-21 years of age	0.8 (0.4-1.6)	1.4 (0.8-2.4)	1.2 (0.6-2.5)	1.8 (0.9-3.7)	2.3 (1.1-4.8)*	0.6 (0.3-1.1)
22-24 years of age	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex						
Female	0.4 (0.0-7.3)	1.3 (0.8-2.1)	2.4 (0.1-40.2)	4.1 (2.3-7.3)**	4.2 (2.3-7.4)**	1.7 (0.9-3.1)
Male	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Race						
White	1.0 (0.5-2.0)	1.6 (0.8-3.1)	1.0 (0.5-2.1)	0.6 (0.3-1.6)	0.7 (0.3-1.7)	1.6 (0.6-3.9)
Black/African American	1.5 (0.7-3.3)	1.9 (0.9-4.0)	0.7 (0.3-1.4)	0.4 (0.2-1.2)	0.6 (0.2-1.7)	2.3 (0.9-5.9)
Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Class status						
Freshmen	4.2 (1.4-12.7)*	3.5 (1.3-9.6)*	0.2 (0.1-0.7)*	1.7 (0.5-5.9)	0.5 (0.1-1.8)	0.6 (0.2-2.1)
Sophomore	1.8 (0.8-4.1)	1.3 (0.6-2.7)	0.6 (0.2-1.3)	0.9 (0.4-2.3)	0.5 (0.2-1.3)	1.1 (0.4-2.8)
Junior	1.0 (0.5-1.9)	1.2 (0.7-2.1)	1.0 (0.5-2.1)	0.7 (0.4-1.5)	0.9 (0.4-1.8)	1.3 (0.7-2.7)
Senior	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

(table continues)

Characteristics	Sex with alcohol/drugs			Sex with new partner without sexual history		
	0 times	1-4 times	5 or more times	0 times	1-4 times	5 or more times
	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Marital status						
Never married	2.4 (0.8-7.1)	1.7 (0.8-4.0)	0.4 (0.1-1.3)	2.2 (0.9-5.5)	2.2 (0.8-5.5)	0.5 (0.2-1.2)
Married/Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex ed prior to college						
Yes	4.2 (0.5-37.8)	6.3 (0.7-57.5)	5.6 (0.6-50.3)	2.4 (0.5-11.1)	0.3 (0.1-0.6)	0.4 (0.2-0.9)
No	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex ed during college						
Yes	1.1 (0.3-3.6)	1.5 (0.5-4.7)	5.4 (1.0-28.1)*	1.4 (0.5-4.2)	2.8 (0.7-10.7)	1.6 (0.4-6.9)
No	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Table C7

Multinomial Regression Analysis Sexual Behavior by Sexual Education Categories (n = 656)

	Sex with partner who had a STI diagnosis		Sex with multiple sex partners		
	Yes	No	5 or more times	0 times	1-4 times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Age					
18-19 years of age	0.1 (0.0-6.1)	0.1 (0.0-6.1)	0.4 (0.1-1.9)	0.4 (0.1-1.6)	2.3 (0.5-9.7)
20-21 years of age	0.6 (0.1-3.2)	1.7 (0.3-9.7)	1.0 (0.3-2.7)	0.7 (0.2-2.0)	1.0 (0.4-2.9)
22-24 years of age	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex					
Female	1.4 (0.0-2.1)	7.1 (4.9-10.0)	7.0 (3.6-15.4)	5.5 (3.4-9.0)	1.1 (0.5-2.7)
Male	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Race					
White	0.3 (0.1-2.0)	3.3 (0.5-21.3)	0.2 (0.0-1.5)	0.2 (0.0-1.6)	5.3 (0.7-41.0)
Black/African American	1.6 (0.3-9.1)	0.6 (0.1-3.5)	0.1 (0.0-1.1)	0.2 (0.0-1.3)	7.7 (1.0-62.0)
Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Class status					
Freshmen	3.8 (0.1-154.4)	0.3 (0.0-10.8)	2.7 (0.6-12.9)	2.2 (0.4-11.1)	0.4 (0.1-1.8)
Sophomore	0.4 (0.0-5.2)	2.3 (0.2-26.5)	1.6 (0.4-5.8)	1.3 (0.3-4.8)	0.6 (0.2-2.2)
Junior	0.6 (0.1-3.6)	1.7 (0.3-9.7)	1.1 (0.4-3.3)	1.4 (0.5-4.1)	0.9 (0.3-2.5)
Senior	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

(table continues)

	Sex with partner who had a STI diagnosis		Sex with multiple sex partners		
	Yes	No	5 or more times	0 times	1-4 times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Marital status					
Never married	2.5 (0.0-	0.2 (0.1-0.8)	1.1 (0.2-5.6)	0.6 (0.1-3.2)	0.9 (0.2-4.4)
Married/Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sexual orientation					
Heterosexual	7.6 (0.0-15.4)	2.2 (0.8-5.6)	1.6 (0.2-14.6)	3.6 (0.3-44.9)	0.6 (0.1-5.8)
Gay/Lesbian/Bisexual	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex ed prior to college					
Yes	1.4 (0.5-4.3)	5.3 (1.2-23.8)*	4.5 (0.8-24.8)	6.0 (0.7-54.5)	0.4 (0.1-1.6)
No	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex ed during college					
Yes	1.2 (1.2-1.2)***	1.9 (0.7-5.3)	1.1 (0.4-3.2)	5.2 (1.0-27.2)	0.5 (0.2-1.0)
No	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Table C8

Multinomial Regression Analysis of Demographic Variables by Sexual Behavior Categories (n = 656)

	Sexual intercourse	Age of first sexual intercourse			Number of sex partners		
	Yes	13 years old or younger	14-16 years old	17 years old or older	1 person	2-4 people	or more people
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Age							
18-19 years of age	0.5 (0.3-0.7)	0.8 (0.1-4.4)	1.6 (0.8-3.7)	1.2 (0.2-6.8)	1.2 (0.4-3.3)	2.2 (0.9-5.2)	0.8 (0.3-2.4)
20-21 years of age	0.7 (0.4-1.2)	0.2 (0.1-0.7)*	0.8 (0.5-1.4)	4.8 (1.4-16.7)	1.9 (1.0-3.8)	2.3 (1.3-4.2)**	0.5 (0.3-1.0)
22-24 years of age	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex							
Female	6.5 (4.5-9.6)	1.9 (0.1-3.6)	1.2 (0.1-2.1)	4.0 (1.7-9.1)**	0.9 (0.6-1.4)	1.2 (0.8-1.8)	1.1 (0.7-1.8)
Male	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Race							
White	1.2 (0.7-2.1)	0.4 (0.1-1.5)	0.8 (0.4-1.4)	2.4 (0.7-8.7)	.8 (0.8-3.7)	1.2 (0.7-2.3)	0.6 (0.3-1.2)
Black/ African American	1.1 (0.6-2.1)	1.7 (0.5-5.8)	1.0 (0.5-1.8)	0.6 (0.2-2.0)	.8 (0.4-1.7)	0.8 (0.4-1.7)	1.2 (0.5-2.7)
Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Class Status							
Freshmen	0.5 (0.3-0.8)	1.0 (0.1-6.5)	0.7 (0.3-1.7)	1.0 (0.2-7.1)	2.0 (0.7-6.0)	1.0 (0.4-2.6)	0.5 (0.2-1.5)
Sophomore	0.7 (0.4-1.2)	1.5 (0.3-6.7)	0.8 (0.4-1.6)	0.7 (0.1-2.9)	1.2 (0.5-2.8)	0.6 (0.3-1.2)	0.8 (0.4-1.9)
Junior	0.9 (0.5-1.5)	1.2 (0.4-3.9)	0.9 (0.5-1.4)	0.8 (0.3-2.4)	1.0 (0.5-2.0)	0.7 (0.4-1.3)	1.0 (0.5-1.9)
Senior	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

(table continues)

	Sexual intercourse	Age of first sexual intercourse			Number of sex partners		
	Yes	13 years old or younger	14-16 years old	17 years old or older	1 person	2-4 people	5 or more people
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Marital status							
Never married	0.2 (0.1-0.8)	0.5 (0.1-1.8)	0.8 (0.4-1.8)	2.1 (0.6-7.9)	2.9 (0.8-10.5)	1.1 (0.5-2.5)	0.3 (0.1-1.2)
Married/Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sexual orientation							
Heterosexual	2.0 (0.7-5.7)	0.7 (0.1-7.5)	1.8 (0.3-4.6)	1.4 (0.1-14.2)	0.8 (0.1-5.1)	0.4 (0.1-1.9)	1.2 (0.2-7.9)
Gay/Lesbian/Bisexual	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Table C9

Multinomial regression analysis of Demographic Variables by Sexual Behavior Categories (n = 656)

	Sex partners in past 3 months			Sexual intercourse in 30 days		
	No sex in past 3 months	1 person	2 or more people	0-3 times	4 to 9 times	10 or more times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Age						
18-19 years of age	0.6 (0.2-2.2)	0.5 (0.2-1.3)	1.6 (0.5-5.8)	0.5 (0.2-1.4)	0.4 (0.1-1.2)	2.0 (0.7-5.2)
20-21 years of age	0.9 (0.4-2.1)	0.7 (0.3-1.3)	1.1 (0.5-2.6)	0.6 (0.3-1.3)	0.7 (0.3-1.5)	1.6 (0.8-3.1)
22-24 years of age	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex						
Female	2.2 (1.2-3.9)**	3.5 (0.0-7.2)	1.7 (0.0-2.9)	4.6 (0.3-82.0)	1.2 (0.7-2.1)	0.2 (0.1-3.9)
Male	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Race						
White	1.0 (0.4-2.6)	1.0 (0.5-2.1)	1.0 (0.4-2.6)	1.2 (0.6-2.3)	1.1 (0.5-2.4)	0.9 (0.4-1.7)
Black/African American	0.7 (0.3-1.9)	0.4 (0.2-0.9)	1.4 (0.5-3.8)	2.5 (1.2-5.3)**	1.6 (0.7-3.7)	0.4 (0.2-0.9)*
Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Class status						
Freshmen	0.6 (0.1-2.3)	1.1 (0.4-3.3)	1.7 (0.4-6.8)	0.9 (0.3-2.4)	1.1 (0.4-3.6)	1.2 (0.4-3.3)
Sophomore	0.7 (0.3-2.1)	0.8 (0.4-1.9)	1.4 (0.5-3.8)	0.8 (0.3-1.7)	0.9 (0.4-2.2)	1.3 (0.6-3.0)
Junior	1.1 (0.4-2.5)	0.9 (0.5-1.9)	0.9 (0.4-2.3)	1.0 (0.5-2.0)	0.9 (0.4-1.8)	1.0 (0.5-1.9)
Senior	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Marital status						
Never married	0.2 (0.0-0.8)	1.6 (0.7-3.7)	0.3 (0.1-1.7)	3.8 (1.5-9.7)**	1.5 (0.6-3.9)	0.3 (0.1-0.7)
Married/Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

(table continues)

	Sex partners in past 3 months			Sexual intercourse in 30 days		
	No sex in past 3 months	1 person	2 or more people	0-3 times	4 to 9 times	10 or more times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Sexual orientation						
Heterosexual	0.1 (0.0-1.4)	3.5 (0.5-27.3)	4.4 (0.7-27.5)	0.5 (0.1-2.7)	1.1 (0.7-1.6)	1.9 (0.4-9.4)
Gay/ Lesbian/ Bisexual	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Table C10

Multinomial Regression Analysis of Demographic Variables by Sexual Behavior Categories (n = 656)

	Condom use			Oral sex with no condom		
	Never used a condom	Sometimes use a condom	Always used a condom	0 times	1-4 times	5 or more times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Age						
18-19 years of age	0.5 (0.2-1.7)	1.6 (0.6-4.5)	1.8 (0.6-5.7)	2.6 (0.5-13.7)	0.8 (0.3-2.7)	0.4 (0.1-2.0)
20-21 years of age	0.6 (0.3-1.3)	1.3 (0.7-2.5)	1.6 (0.8-3.4)	0.9 (0.3-2.7)	1.2 (0.6-2.5)	1.2 (0.4-3.1)
22-24 years of age	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex						
Female	2.2 (1.2-3.9)**	2.2 (0.1-36.3)	1.7 (0.0-2.9)	0.1 (0.0-1.0)*	1.1 (0.5-2.1)	0.9 (0.5-1.7)
Male	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Race						
White	0.6 (0.2-1.3)	0.7 (0.4-1.6)	1.8 (0.8-4.1)	1.0 (0.3-3.5)	0.5 (0.2-1.1)	1.1 (0.3-3.9)
Black/African American	0.7 (0.3-1.8)	1.0 (0.4-2.2)	1.4 (0.6-3.4)	2.1 (0.6-8.2)	1.0 (0.5-2.2)	0.5 (0.1-1.8)
Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Class status						
Freshmen	0.8 (0.2-2.9)	0.5 (0.2-1.4)	1.2 (0.3-4.1)	0.5 (0.1-2.9)	1.6 (0.5-5.3)	2.1 (0.3-12.4)
Sophomore	1.6 (0.6-4.1)	0.8 (0.4-1.9)	0.6 (0.2-1.6)	0.5 (0.1-2.2)	0.7 (0.3-1.7)	2.0 (0.4-9.2)
Junior	1.2 (0.6-2.6)	0.9 (0.4-1.7)	0.8 (0.4-1.7)	1.4 (0.5-3.9)	0.7 (0.3-1.4)	0.7 (0.3-2.0)
Senior	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Marital status						
Never married	0.5 (0.2-1.5)	0.7 (0.2-1.9)	2.0 (0.6-6.3)	2.5 (0.3-19.9)	2.7 (0.6-12.1)	0.4 (0.1-3.2)
Married/Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

(table continues)

	Condom use			Oral sex with no condom		
	Never used a condom	Sometimes use a condom	Always used a condom	0 times	1-4 times	5 or more times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Sexual Orientation						
Heterosexual	5.2 (0.5-50.4)	1.8 (0.5-7.1)	0.2 (0.0-1.8)	0.6 (0.2-1.6)	0.8 (0.2-3.9)	2.1 (0.7-6.5)
Gay/Lesbian/Bisexual	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Table C11

Multinomial Regression Analysis of Demographic Variables by Sexual Behavior Categories (n = 656)

	Anal sex with no condom			Hooking up		
	0 times	1-4 times	5 or more times	0 times	1-4 times	5 or more times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Age						
18-19 years of age	0.8 (0.2-3.2)	0.6 (0.1-2.6)	1.2 (0.3-4.5)	0.5 (0.2-1.9)	0.2 (0.1-0.9)*	1.9 (0.5-6.5)
20-21 years of age	1.2 (0.5-3.0)	0.9 (0.3-2.6)	0.8 (0.3-2.0)	2.2 (0.9-2.1)	1.0 (0.4-2.7)	0.5 (0.2-1.1)
22-24 years of age	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex						
Female	4.1 (2.7-6.3)	1.8 (0.8-3.9)	0.7 (0.4-1.6)	1.1 (0.0-2.6)	1.2 (0.6-2.5)	1.0 (0.6-1.8)
Male	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Race						
White	1.2 (0.5-3.1)	1.3 (0.5-3.8)	0.8 (0.3-2.1)	2.1 (0.9-5.0)	1.5 (0.6-4.1)	0.5 (0.0-1.1)
Black/ African American	1.2 (0.4-3.4)	0.8 (0.2-2.7)	0.8 (0.3-2.4)	2.6 (1.0-6.6)	1.1 (0.4-3.4)	0.4 (0.2-1.0)
Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Class status						
Freshmen	1.0 (0.2-4.7)	1.1 (0.2-6.3)	1.0 (0.2-4.3)	3.1 (0.7-12.9)	6.4 (1.2-34.3)*	0.3 (0.1-1.3)
Sophomore	0.8 (0.3-2.6)	1.5 (0.4-5.4)	1.2 (0.4-3.9)	1.2 (0.4-4.0)	2.9 (0.8-11.0)	0.8 (0.3-2.6)
Junior	0.6 (0.2-1.3)	0.9 (0.3-2.3)	1.8 (0.7-4.4)	0.6 (0.2-1.3)	0.9 (0.3-2.4)	1.8 (0.8-4.2)
Senior	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Marital status						
Never married	1.4 (0.4-4.9)	1.6 (0.4-6.4)	0.7 (0.2-2.3)	1.5 (0.5-4.7)	0.7 (0.2-2.3)	0.7 (0.2-2.1)
Married/Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

(table continues)

	Anal sex with no condom			Hooking up		
	0 times	1-4 times	5 or more times	0 times	1-4 times	5 or more times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Sexual Orientation						
Heterosexual	1.3 (0.1-12.0)	3.1 (0.2-55.0)	0.7 (0.1-6.7)	0.3 (0.0-2.7)	2.6 (0.0-12.2)	3.9 (0.4-41.5)
Gay/ Lesbian/ Bisexual	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Table C12

Multinomial Regression Analysis of Demographic Variables by Sexual Behavior Categories (n = 656)

	Sex with alcohol/drugs			Sex with new partner without sexual history		
	0 times	1-4 times	5 or more times	0 times	1-4 times	5 or more times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Age						
18-19 years of age	1.0 (0.4-2.6)	1.0 (0.4-2.5)	1.0 (0.4-2.8)	1.4 (0.5-4.3)	3.2 (1.0-10.0)*	0.7 (0.2-2.2)
20-21 years of age	0.8 (0.4-1.6)	1.4 (0.8-2.4)	1.2 (0.6-2.5)	1.8 (0.9-3.7)	2.3 (1.1-4.8)*	0.6 (0.3-1.1)
22-24 years of age	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex						
Female	0.4 (0.0-7.3)	1.3 (0.8-2.1)	2.4 (0.1-40.2)	4.1 (2.3-7.3)**	4.2 (2.3-7.4)**	1.7 (0.9-3.1)
Male	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Race						
White	1.0 (0.5-2.0)	1.6 (0.8-3.1)	1.0 (0.5-2.1)	0.6 (0.3-1.6)	0.7 (0.3-1.7)	1.6 (0.6-3.9)
Black/African American	1.5 (0.7-3.3)	1.9 (0.9-4.0)	0.7 (0.3-1.4)	0.4 (0.2-1.2)	0.6 (0.2-1.7)	2.3 (0.9-5.9)
Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Class status						
Freshmen	4.2 (1.4-12.7)*	3.5 (1.3-9.6)*	0.2 (0.1-0.7)*	1.7 (0.5-5.9)	0.5 (0.1-1.8)	0.6 (0.2-2.1)
Sophomore	1.8 (0.8-4.1)	1.3 (0.6-2.7)	0.6 (0.2-1.3)	0.9 (0.4-2.3)	0.5 (0.2-1.3)	1.1 (0.4-2.8)
Junior	1.0 (0.5-1.9)	1.2 (0.7-2.1)	1.0 (0.5-2.1)	0.7 (0.4-1.5)	0.9 (0.4-1.8)	1.3 (0.7-2.7)
Senior	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Marital status						
Never married	2.4 (0.8-7.1)	1.7 (0.8-4.0)	0.4 (0.1-1.3)	2.2 (0.9-5.5)	2.2 (0.8-5.5)	0.5 (0.2-1.2)
Married/Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sexual Orientation						
Heterosexual	0.2 (0.0-1.4)	0.6 (0.1-3.7)	4.0 (0.7-22.4)	1.5 (0.2-8.6)	1.1 (0.2-6.5)	0.7 (0.1-4.0)
Gay/ Lesbian/ Bisexual	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Table C13

Multinomial Regression Analysis of Demographic Variables by Sexual Behavior Categories (n = 656)

	Sex with partner who had a STI diagnosis		Sex with multiple sex partners		
	Yes	No	0 times	1-4 times	5 or more times
Characteristics	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Age					
18-19 years of age	0.1 (0.0-6.1)	0.1 (0.0-6.1)	0.4 (0.1-1.9)	0.4 (0.1-1.6)	2.3 (0.5-9.7)
20-21 years of age	0.6 (0.1-3.2)	1.7 (0.3-9.7)	1.0 (0.3-2.7)	0.7 (0.2-2.0)	1.0 (0.4-2.9)
22-24 years of age	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sex					
Female	1.4 (0.0-2.1)	7.1 (4.9-10.0))	7.0 (3.6-15.4)	5.5 (3.4-9.0)	1.1 (0.5-2.7)
Male	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Race					
White	0.3 (0.1-2.0)	3.3 (0.5-21.3)	0.2 (0.0-1.5)	0.2 (0.0-1.6)	5.3 (0.7-41.0)
Black/African American	1.6 (0.3-9.1)	0.6 (0.1-3.5)	0.1 (0.0-1.1)	0.2 (0.0-1.3)	7.7 (1.0-62.0)
Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Class status					
Freshmen	3.8 (0.1-154.4)	0.3 (0.0-10.8)	2.7 (0.6-12.9)	2.2 (0.4-11.1)	0.4 (0.1-1.8)
Sophomore	0.4 (0.0-5.2)	2.3 (0.2-26.5)	1.6 (0.4-5.8)	1.3 (0.3-4.8)	0.6 (0.2-2.2)
Junior	0.6 (0.1-3.6)	1.7 (0.3-9.7)	1.1 (0.4-3.3)	1.4 (0.5-4.1)	0.9 (0.3-2.5)
Senior	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Marital status					
Never married	2.5 (0.0-4.3)	0.2 (0.1-0.8)	1.1 (0.2-5.6)	0.6 (0.1-3.2)	0.9 (0.2-4.4)
Married/Other	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]
Sexual orientation					
Heterosexual	7.6 (0.0-15.4)	2.2 (0.8-5.6)	1.6 (0.2-14.6)	3.6 (0.3-44.9)	0.6 (0.1-5.8)
Gay/Lesbian/Bisexual	1.00[b]	1.00[b]	1.00[b]	1.00[b]	1.00[b]

Note. 1.00[b]: reference variable. *$p < .05$ **$p < .01$ ***$p < .0001$

Table C14

Descriptive Statistics of Demographic and Sex Ed Variables by Perceptions of Contracting a STI Without a Condom (n = 656)

	Perception of contracting STI							
	Impossible		Unlikely		Likely		Very likely	
	n (%)	95% CI	*n* (%)	95% CI	*n* (%)	95% CI	*n* (%)	95% CI
Characteristics	64 (9.8)	7.5-12.1	200 (30.5)	27.0-34.0	226 (34.5)	30.9-38.1	166 (25.3)	22.0-28.6
Age								
18-19 years of age	25 (10.4)	8.1-12.7	70 (29.0)	25.5-32.5	91 (37.8)	34.1-41.5	55 (22.8)	19.6-26.0
20-21 years of age	19 (8.4)	6.3-10.5	65 (28.8)	25.3-32.3	86 (38.1)	34.4-41.8	56 (24.7)	21.4-28.0
22-24 years of age	20 (10.6)	8.2-13.0	65 (34.4)	30.8-38.0	49 (25.9)	22.6-29.3	55 (29.1)	25.6-32.6
Sex								
Male	21 (9.9)	7.6-12.2	72 (34.0)	30.4-37.6	81 (38.2)	34.5-41.9	38 (17.9)	15.0-20.1
Female	42 (9.5)	7.3-11.7	128 (29.0)	25.5-32.5	145 (32.8)	29.2-36.4	127 (28.7)	25.2-32.2
Other	1 (50.0)	46.2-53.8					1 (50.0)	46.2-53.8
Race								
White	31 (8.2)	6.1-10.3	138 (36.3)	32.6-40.0	137 (36.1)	32.4-39.8	74 (19.5)	16.5-22.5
Black/ African American	22 (11.6)	9.2-14.1	43 (22.6)	19.4-25.8	61 (32.1)	28.5-35.7	64 (33.7)	30.1-37.3
Other	11 (12.8)	10.2-15.4	19 (22.1)	18.9-25.3	28 (32.6)	29.0-36.2	28 (32.6)	29.0-36.2
Class Status								
Freshmen	20 (11.8)	9.3-14.3	53 (31.4)	27.9-35.0	58 (34.3)	30.7-37.9	38 (22.5)	19.3-25.7
Sophomore	12 (8.9)	6.7-11.1	35 (25.9)	22.6-29.3	59 (43.7))	39.9-47.5	29 (21.5)	18.4-24.6
Junior	19 (11.3)	8.9-13.7	46 (27.4)	24.0-30.8	58 (34.5)	30.9-38.1	45 (26.8)	23.4-30.2
Senior	13 (7.1)	5.1-9.1	66 (35.9)	32.2-39.6	51 (27.7)	24.3-31.1	54 (29.3)	25.8-32.8

(table continues)

	Perception of contracting STI							
	Impossible		Unlikely		Likely		Very likely	
	n (%)	95% CI	*n* (%)	95% CI	*n* (%)	95% CI	*n* (%)	95% CI
Characteristics	64 (9.8)	7.5-12.1	200 (30.5)	27.0-34.0	226 (34.5)	30.9-38.1	166 (25.3)	22.0-28.6
Marital status								
Never married	53 (9.0)	6.8-11.2	185 (31.4)	27.9-35.0	208 (35.3)	31.6-39.0	144 (24.4)	21.1-27.7
Married	9 (29.0)	25.5-32.5	9 (29.0)	25.5-32.5	3 (9.7)	7.4-12.0	10 (32.3)	28.7-35.9
Other	2 (5.7)	3.9-7.5	6 (17.1)	14.2-20.0	15 (42.9)	39.1-46.7	12 (34.3)	30.7-37.9
Sexual orientation								
Heterosexual	57 (10.8)	8.4-13.2	160 (30.2)	26.7-33.7	182 (34.3)	30.7-37.9	131 (24.7)	21.4-28.0
Gay/Lesbian Bisexual	6 (5.5)	3.8-7.2	36 (32.7)	33.5-40.9	34 (30.9)	27.4-34.4	34 (30.9)	27.4-34.4
Not sure	1 (6.3)	4.4-8.2	4 (25.0)	21.7-28.3	10 (62.5)	58.8-66.2	1 (6.2)	4.4-8.1
Sex ed prior to college								
Yes	56 (9.1)	6.9-11.3	189 (31.1)	27.6-34.6	212 (34.9)	31.3-38.6	150 (24.7)	21.4-28.0
No	7 (16.7)	13.9-19.6	9 (21.4)	18.3-24.5	12 (28.6)	25.1-32.1	14 (33.3)	29.7-36.9
Not sure	1 (14.2)	11.5-16.9	2 (28.6)	25.1-32.1	2 (28.6)	25.1-32.1	2 (28.6)	25.1-32.1
Sex ed during college								
Yes	24 (12.6)	10.1-15.1	56 (29.5)	26.0-33.0	64 (33.7)	30.1-37.3	46 (24.2)	20.9-27.5
No	35 (7.8)	5.6-9.9	141 (31.8)	28.2-35.4	155 (34.9)	31.3-38.6	113 (25.5)	22.2-28.8
Not sure	5 (22.8)	19.6-26.0	3 (13.6)	11.0-16.2	7 (31.8)	28.2-35.4	7 (31.8)	28.2-35.4