Assessing the Effects of an STD Educational Intervention on Greek Society College Students’ Knowledge and Attitudes Toward Safe Sex Behaviors

Jennifer W. Goldsberry

Georgia College and State University, scfarm@charter.net

Follow this and additional works at: http://kb.gcsu.edu/dnp

Part of the Public Health and Community Nursing Commons

Recommended Citation
Assessing the Effects of an STD Educational Intervention on Greek Society College Students’ Knowledge and Attitudes Toward Safe Sex Behaviors

Jennifer Goldsberry

Georgia College

Leslie Moore, PhD, RN, CNE, MBA, Committee Chair

Deborah MacMillan, PhD, RNC, CNM, Committee Member

Scott Butler, PhD, MPH, ACS, Committee Member
# Table of Contents

Abstract 3

Chapter I 4

   Problem Statement 4
   Purpose of the Project 5
   Specific Aims and Clinical Questions 5
   Background Information 7
   Supporting Data: Summary of Expert Evidence 7
   Critical Analysis of Expert Evidence 9
   Conceptual Theory 10
   Theory of Planned Behavior 10

Chapter II: Review of Literature 15

Chapter III: Methodology 27

Chapter IV: Results 35

   Clinical Questions 37

Chapter V: Conclusions 54

   Clinical Questions 54
   Strengths and Limitations 57
   Implications for Practice 58

Appendices 60

References 67
Abstract

This study measured the effectiveness of an evidence-based educational intervention targeting STD prevention in Greek society members attending college and examined relationships between sexual health knowledge, attitudes toward safe sex behaviors, and sexual demographics. One hundred thirty-two Greek society members attending college participated. Instruments measured demographic characteristics, knowledge regarding sexually transmitted diseases (STDs), and attitudes toward practicing safe sex behaviors at baseline and one week post-intervention. There was a significant increase in STD knowledge from baseline (\(M=13.03, SD=6.5\)) to one week (\(M=20.27, SD=4.9\)) \(t(131) = -13.53, p = .000\). Fraternity members were more likely to report attitudes toward risky sexual behavior \(rs(132) = .323, p = .000\), and as knowledge increased, attitudes became more favorable to safe sex behaviors (pre-STD knowledge and pre-intervention attitudes, \(r(132) = -.249, p = .004\); post-STD knowledge and post-intervention attitudes, \(rs(132) = -.307, p = .000\)). Results support that a brief STD educational intervention can increase STD knowledge and improve attitudes toward safe sexual behaviors.

Key Words:  College Students, Sexually Transmitted Infections (STI), Greek membership
Chapter I

Common sexually transmitted diseases (STDs) include gonorrhea, chlamydia, human papilloma virus (HPV), genital herpes, hepatitis B, and human immunodeficiency virus (HIV). According to the Centers for Disease Control and Prevention (CDC), young people ages 15 to 24 account for half of the nearly 20 million new STDs in America each year (2011). Eisenberg and colleagues (2012) recognize the college years are a time when young adults seek to examine high-risk sexual behaviors. While 46% of high school students report having had sexual intercourse, over 90% of young adults report having sexual intercourse by age 24 (Eisenberg, Lechner, Frerich, Lust, & Garcia, 2012). These statistics place traditional college students into a population that is considered at high risk to STDs.

Problem Statement

The university at which the proposed evidence-based translational research project will take place is located in Baldwin County, Georgia. According to County Health Rankings and Roadmaps (2014), Baldwin county ranks 123rd out of 159 counties in Georgia in the rate of chlamydia, with 709 cases per 100,000 population versus 554 cases per 100,000 in the state. Georgia and Baldwin County both rank higher than the national average of 460 cases per 100,000. According to the American College Health Association National College Health Assessment II (ACHA-NCHA II) (2013), over 57% of students at Georgia College reported having one or more sexual partners in the past 12 months, with a mean of 2.27 partners in the previous 12 months. Of these students, only 45.5% reported using a method of contraception during last vaginal intercourse. Thus, provision of STD education to college students in Baldwin County is crucial in reducing STD incidence and improving knowledge related to STDs.
Purpose

The purpose of this project is to implement an evidence-based educational intervention targeting STD prevention in Greek society members on a college campus located in middle Georgia. An initial review of the literature was conducted to determine the target population and best practice interventions regarding STD prevention in college students. The review of literature led to targeting the population of Greek society members on a college campus. Several articles in the literature reflect Greek membership is a predictor of infidelity, increased number of casual partners and increased anal sex (Vail-Smith, Macquire, Brinkley, & Burke, 2010; Vail-Smith, Whetstone, & Knox, 2010). These risky sexual behaviors place Greek society members at increased risk of contracting an STD. According to the ACHA (2013), 20% of students attending the university at which this study will take place reported being a member of a social fraternity or sorority.

Specific Aims and Clinical Questions

The purpose of this study is to measure the effectiveness of an evidence-based educational intervention targeting STD prevention in Greek society members attending college. This research aims to increase STD knowledge and attitudes toward practicing safe sex behaviors. The proposed descriptive, correlational study will address the following specific aims and clinical questions:

Specific Aim 1

This project aims to determine if a STD educational intervention will increase STD knowledge and decrease STD misconceptions in Greek society college students.

Specific Aim 2
This project aims to determine if a STD educational intervention will affect Greek society college students’ attitudes toward safe sex behaviors.

**Specific Aim 3**

This project aims to determine if a correlation exists between knowledge of STDs and attitudes toward STDs.

**Clinical Question 1**

How does an STD educational intervention affect STD knowledge among Greek society college students?

**Clinical Question 2**

How does an STD educational intervention affect attitudes toward safe sex behaviors among Greek society college students?

**Clinical Question 3**

Is there a relationship between sexual demographic factors (ie, sexual orientation, number of lifetime oral, vaginal, and anal partners, number of oral, vaginal, and anal partners in past year, previous STD diagnosis, number of alcohol beverages consumed in a typical week, and number of times illegal or prescription drugs used in past month) and STD knowledge pre- and post- educational intervention?

**Clinical Question 4**

Is there a relationship between demographic factors (ie, sexual orientation, number of lifetime oral, vaginal, and anal partners, number of oral, vaginal, and anal partners in past year, previous STD diagnosis, number of alcohol beverages consumed in a typical week, and number of times illegal or prescription drugs used in past month) and attitudes toward practicing safe sex behaviors pre- and post- educational intervention?
Background Information

Many young people have misconceptions regarding STDs. Royer, Heidrich, and Brown (2012) identify common misconceptions to include: being unaware STDs can be transmitted through oral sex; believing STDs can only be transmitted when symptoms are present; and believing only those who have multiple partners should worry about contracting STDs. Many young people do not realize STDs can cause certain types of cancer, increase risk for contracting HIV, or that infertility can result if STDs are untreated (Royer, et al., 2012). Another area of concern in young adults is their engagement in risky sexual behaviors. Alcohol or drug use has been identified in the literature by multiple authors as influencing young people to engage in unprotected sex and to have multiple and casual partners (Dermen & Thomas, 2011; Eisenberg, Garcia, Frerich, Lechner, & Lust, 2012; Gilmore, Granato & Lewis, 2013; Lewis, Litt, Cronce, Blayney, & Gilmore, 2014; Sleap, Heflin, Archuleta, & Crook, 2014; Vail-Smith, Maguire, Brinkley, & Burke, 2010). Greek membership is identified in the literature as also influencing sexual risky behavior. For example, Vail-Smith and colleagues (2010) found Greek males had more sexual partners than non-Greek males and Greek females were more likely to report having anal sex than non-Greek females. In a separate study by Vail-Smith, Whetstone, et al. (2010), fraternity membership was one of seven characteristics identified as likely predictors of infidelity. Therefore, the focus of this translational project is the subgroup of Greek society members on a college campus.

Supporting Data: Summary of Expert Evidence

Healthy People 2020 (2010) provides national objectives for promoting healthy sexual behaviors. Biological, social, economic and behavioral factors that affect the spread of STDs are identified and include: asymptomatic nature of STDs, age and gender disparities, lag time
between exposure and symptoms, racial and ethnic disparities, poverty, substance abuse, sexuality secrecy and sexual networks. Healthy People 2020 calls for STD prevention efforts focusing on the above-mentioned factors to improve the overall sexual health of the nation.

The U.S. Preventative Services Task Force (USPSTF) (2008) recommends high-intensity behavioral counseling to prevent STDs for all sexually active adolescents and adults at increased risk for STDs. High-intensity behavioral counseling is defined as multiple counseling sessions. There is insufficient evidence to support behavioral counseling in non-sexually active adolescents and adults who are not considered at increased risk for STDs.

According to Hunter, Dalby, Marks, Swain, and Schrager (2014), the U.S Preventative Services Task Force, Centers for Disease Control and Prevention, American Academy of Family Physicians, American College of Obstetricians and Gynecologists, and the American Academy of Pediatricians have all agreed on STD screening recommendations and prevention measures. All of these entities agree condom use is the cornerstone of prevention. Low-intensity counseling, defined as brief counseling during an office visit along with provision of information on STD transmission, has not proven to decrease the incidence of STDs. However, evidence supports moderate- and high-intensity behavioral counseling does reduce the risk of STDs (USPSTF, 2008; Hunter, et al, 2014). An example of high-intensity counseling would be attending multiple counseling sessions on STD risk and prevention. Abstinence-only counseling has proven to be ineffective in changing risky sexual behaviors (AMA, 2012; Hunter, et al, 2014).

The World Health Organization (WHO) (2006) proposes specific activities and interventions to reduce the global incidence of STDs. Emphasis is placed on the following: increasing the commitment of government agents, both national and international, for STD
prevention and control; advocating for resources to be focused on priority areas where they are likely to have the largest impact and promoting culture- and gender-sensitive STD programs and services (WHO, 2006).

The American Medical Association (AMA) issued a 2012 report to update previous analyses of sexual education programs by performing a review of literature over the past ten years regarding the effectiveness of both comprehensive and abstinence-only sexual health education programs. This review establishes abstinence-only educational programs are ineffective at keeping youth abstinent until marriage or significantly delaying the age of onset of sexual activity. The need for sexual health education that results in behavior change, risk behavior reduction, or a measurable change in knowledge, attitudes and beliefs is recognized. Therefore, the AMA supports the redirection of federal resources to the development and dissemination of comprehensive sexual health education programs that include scientifically accurate information on abstinence, contraception, condom use, transmission of STDs, and teen pregnancy (AMA, 2012).

**Critical Analysis of Expert Evidence**

The experts recognize sexual health is affected by a multitude of factors including social, biological, economic and behavioral factors. Overall, the experts agree, abstinence-only focused education has not proven effective and comprehensive sexual health education programs are needed to reduce the incidence of STDs. Comprehensive education should include information regarding sexually risky behaviors (such as alcohol use, multiple partners, inconsistent condom use), and accurate information regarding the transmission of STDs, symptoms, prevalence and treatment of STDs.
Conceptual Theory

Scholarship in nursing is defined by the American Association of Colleges of Nursing (AACN) as “activities that systematically advance the teaching, research, and practice of nursing through rigorous inquiry that 1) is significant to the profession, 2) is creative, 3) can be documented, 4) can be replicated or elaborated, and 5) can be peer-reviewed through various methods” (American Association of Colleges of Nursing, 2014). Essential one, as set forth in *The Essentials of Doctoral Education for Advanced Nursing Practice* by the AACN (2006), addresses scholarly practice based on theoretical frameworks. The AACN (2006) recognizes that advanced nursing practice requires a strong scientific foundation and that this foundation must be expanded upon using approaches based on theoretical frameworks.

Theories and theoretical frameworks are necessary in practice scholarship and are the cornerstone of nursing in that they provide systematic guidance and rationale for developing professional practice approaches (Erci, 2012). Choosing a theoretical framework to guide the design and implementation of an intervention aimed at college students to decrease their risk of STDs is imperative to ensure the process is based on a strong scientific foundation. The theory of planned behavior (TPB) has been chosen for this proposed study.

Theory of Planned Behavior

Icek Ajzen, a social psychologist, developed the TPB in 1985 as an extension to the theory of reasoned action (TRA) developed by Ajzen and Fishbein in 1975 (Ajzen, 1985). The TPB and TRA are conceptual frameworks used to guide the study of human action and are based on three types of beliefs: behavioral beliefs, normative beliefs and control beliefs (Ajzen, 2002). Behavioral beliefs are beliefs an individual has about the likely consequences of a behavior; these beliefs result in a favorable or unfavorable attitude toward a behavior. Normative beliefs
are beliefs an individual has about the normal expectations of other people in their life and result in perceived social pressure or subjective norms. Control beliefs are beliefs about the presence of factors that may promote or hinder the performance of a behavior, resulting in perceived behavioral control (Ajzen, 2002). Behavioral, normative, and control beliefs comprehensively lead to the intent to perform a behavior. Intentions are the indication of how much effort a person is willing to exert in order to perform a behavior (Ajzen, 1991).

The key concept in the TPB that differs from the TRA is perceived behavioral control. According to the original construct of the TRA theory, one may predict a behavior will occur once an intention has been formed. However, not all behavior is under complete volitional control of the individual. Therefore, perceived behavioral control provides a more accurate prediction of intention and behavior. Perceived behavioral control can be measured directly, through questioning an individual about the ability to perform a particular behavior or indirectly, by assessing the beliefs of how easy or difficult the performance of a particular behavior will be (Ajzen, 2002).
Figure 1. Model of Theory of Planned Behavior.

The TPB has been used extensively in research with over 30,000 reference citations and its constructs have been established as reliable in the prediction of a range of health behaviors, including sexual risk behaviors (Tyson, Covey, & Rosenthal, 2014). In a meta-analysis performed by Tyson, Covey and Rosenthal in 2014, forty-seven randomized controlled trials or quasi-experimental studies were found in which the TPB was used to design an intervention to reduce sexual risky behaviors in heterosexuals. This meta-analysis revealed that TPB-directed interventions had significant impact on sexual behavior as well as knowledge, attitudes and intentions. Additionally, the TPB was used in a 2011 study conducted by Boudewyns and Paquin to determine which of the theory’s constructs, (attitudes, norms, or perceived behavioral control) was most likely to affect college students’ intent to get STD testing. A second aim of the study was to determine the specific beliefs that differentiated intenders and non-intenders.
The authors found attitudes to be the strongest predictor of intentions and belief that getting tested would show respect to their partner was positively associated with intention. Additionally, the TPB has been used in at least one study incorporating knowledge of a behavior as an antecedent in the theory, with the assumption that knowledge guides informed decisions about behaviors (Polonsky, Renzaho, Ferous, & McQuilten, 2013). In this Australian study, the authors found knowledge regarding blood donation to indirectly impact intentions. Therefore, in regards to behaviors that rely on knowledge of how the behavior is actually performed, knowledge may be considered a necessary component of forming an intention toward that particular behavior. However, no studies could be found incorporating the concept of knowledge of STDs into the TPB. Therefore, the proposed study will help to determine if knowledge affects the predictability of sexual behavior using the TPB.

The proposed study will use the TPB framework to guide the dissemination and assessment of knowledge related to STDs and any effects this knowledge or lack thereof, may have on the beliefs, feelings and intentions to act toward STDs. Behavioral beliefs refer to the beliefs an individual has regarding the likely consequences of a behavior. Through a comprehensive STD educational program, students will be given the opportunity to gain knowledge of potential consequences related to sexually risky behavior, with a focus on common STDs and the often, lifelong sequelae associated with STD diagnoses. The knowledge gained will allow the students to make informed decisions regarding sexual behavior based on factual information regarding potential consequences and possibly change their current behavioral beliefs. Speaking to normative beliefs, the education program will serve to dispel common misconceptions regarding peer sexual behaviors as discussed in the literature. The aim will be to
convey a more accurate belief of actual peer sexual behaviors based on the literature review and hence change the students’ normative beliefs regarding safe sex practices. Finally, control beliefs will be addressed by educating students on ways to take control of their sexual behavior without feeling awkward or embarrassed. According to the constructs of the theory, the combined effects of increased knowledge regarding STDs and their consequences, changes in normative beliefs, and increased perceived behavioral control regarding safe sex behaviors, favorable attitudes and intentions to act on safe sex behaviors should result.

**Definitions**

Knowledge can be defined as “the range of a person’s understanding of something” (Merriam-Webster, 2015). For this study, STD knowledge will be operationalized as a comprehensive understanding of common STDs, including transmission, consequences, treatments, and measures for prevention. Intention has been defined by Ajzen as the indication of how much effort a person is willing to exert in order to perform a behavior (1991). For this study, STD intention to act toward STDs will be operationalized as an individuals’ willingness to put forth an effort to practice safer sex behaviors in the future. Finally, attitude can be defined as a “feeling or emotion toward a fact or state” (Merriam-Webster, 2015). For this study, attitude toward STDs will be operationalized as combined beliefs, feelings, and intentions to act toward STDs.
Chapter II

Review of Literature

A review of existing literature regarding high-risk sexual behaviors of college students and effective interventions was conducted using databases from CINAHL, MEDLINE/PubMed, EBSCO, the Cochrane library and secondary references from primary articles. Databases were searched using keywords such as sexually transmitted infections, college students, sexuality, intervention, and prevention in varying combinations. The initial search returned 2,807 articles. Selection criteria were used to narrow the search to research-based, English publications published after 2010. This quickly reduced the number of articles retrieved to 52. These 52 articles were reviewed in depth and 33 were excluded due to having too few subjects, not being a cross-sectional or case-control study, subjects not being of age 18-24, or simply not pertaining to the topic. Upon review of these remaining nineteen studies, a common theme emerged identifying Greek society members as a subgroup of the college population that may be at increased vulnerability of STDs. Therefore, another search of the databases was conducted as described above and the keywords “Greek membership” were included. Three new articles were found for a total of 22 articles.

High Risk Sexual Behaviors Related to STDs

Several studies were exploratory in design and suggested early age at first intercourse, numerous sexual partners, casual intercourse, lack of condom use and substance abuse were behavioral risk factors for occurrence of STDs (Hickey & Cleland, 2012; McCave, Chertok, Winter & Haile, 2013; Scott-Sheldon, Carey, & Carey, 2010; Trieu, Bratton, & Marshak, 2011; Turchik, Garske, Probst, & Irvin, 2010; Vail-Smith, Maguire, Brinkley & Burke, 2010). Perceptions of peer sexual activity have also been found to directly influence sexual behaviors
Furthermore, sexual infidelity in monogamous relationships was identified by Vail-Smith, Whetstone and Knox (2010) as a contributing factor to increased STD risk. Other findings recognize lack of knowledge and misconceptions of STD transmission and prevalence as affecting college students’ sexual behaviors (Moore & Smith, 2012).

**Condom Use.** Zhou and colleagues (2012) found that consistent and correct condom use predicted STD infection with a 95% confidence interval at a specificity of 88.8 and a sensitivity of 8.4. However, college students do not always use condoms consistently and correctly. Hickey and Cleland (2013) found that condom use was significantly associated with the number of sexual partners and living situation. Those students who reported multiple sexual partners were more likely to use condoms than those who reported a single partner. Students living off-campus with friends were less likely to report consistent condom use (Hickey & Cleland, 2013). A comparison of first semester and second semester freshmen conducted by Vail-Smith, Macquire et al. (2010) found a pattern of decreased condom use among white, female students for vaginal intercourse between first and second semester freshmen. McCave et al. (2013) identified a significant lack of condom use during anal and oral sex. An astounding 92.7% of the sample reported never using a condom during oral sex and 58.9% reported never using a condom during anal sex. Only 30.6% reported always using a condom during vaginal sex. The findings of these studies indicate the need for improved education in college students regarding consistent and correct use of condoms.

**Number of Sexual Partners.** Hickey and Cleland (2013) found 19.2% of their sample reported having multiple sexual partners. Similarly, a study conducted by Vail-Smith, Maguire et al. (2010), revealed 26% of freshmen reported having five or more sexual partners. Trieu et
al. (2011) reported only 10.3% of their sample indicated having four or more partners. The limitations that exist within the studies regarding number of sexual partners are related to the sample characteristics. For example, the sample consisted of 458 female students ages 18-24 in a study by Hickey and Cleland (2012), versus participants of both genders, in the Vail-Smith, Maguire et al. (2010) study and they were all first or second semester freshmen. The only demographic possibly explaining the lower percentage of students reporting multiple partners in the Trieu et al. (2011) study is a large portion of the sample (1709 out of 4500) reported being in a committed relationship. This may have skewed the results for the variable number of partners.

**Substance Abuse.** Alcohol and drug use have been reported throughout the literature to influence sexual behavior. College students are especially prone to alcohol’s influence. An overarching theme in the literature indicates that alcohol use prior to sex increases the likelihood of having intercourse and decreases the likelihood of condom use. Turchik et al. (2010) found greater alcohol and drug use were related to risky sexual behavior in both male and female college students. They also reported, along with increased alcohol and drug use, that personality traits of extraversion and low agreeableness in men and sexual excitation and low inhibition in women, are further predictors of sexual risk taking. Hickey and Cleland (2013) also discovered an association of decreased condom use with alcohol use. Similarly, Vail-Smith, Maguire et al. (2010) reported an association between alcohol use and decreased condom use as well as increased number of casual sexual partners. Scott-Sheldon et al. (2010) found that female students report more unprotected sex after heavy drinking.

**Peer Perceptions.** Two studies identified perceived actions of peers as having influence on individual sexual behaviors. Brandhorst et al. (2012) examined 322 college students’ perceptions of peer sexual activity and compared this to the individuals reported sexual activity.
The researchers discovered participants’ perception of greater peer sexual activity was directly related to their own sexual activity. Likewise, Lewis et al. (2014) reported that college students overestimate risky sexual behavior in their peers and underestimate protective behaviors. These perceptions were found to positively correlate to actual behavior.

**Sexual Infidelity.** A false sense of safety may exist for those who are in monogamous relationships while in college. According to Vail-Smith, Whetstone et al. (2010), many young adults are experiencing regular exposure to STs without their awareness. Sexual infidelity seems to be common during the college years and due to the illusion of safety in monogamous relationships, condom use is often low. In a study of 1244 college students, conducted by Vail-Smith, Whetstone et al. (2010), almost one fourth (22.6%) of the sample that reported being in a relationship also reported infidelity.

**High Risk Sexual Behaviors of Greek Members**

An unexpected finding involving Greek membership emerged during the initial literature review. Several studies extrapolated data that indicated Greek membership influenced sexual risky behavior. For example, in their study regarding sexual behaviors in first and second semester freshmen, Vail-Smith, Macquire et al. (2010) had a secondary goal of determining what subgroups of incoming freshmen may be at increased risk for risky sexual behaviors. Through data mining techniques in the form of decision trees, they found the subgroup of Greek society members to be at higher risk for certain sexual behaviors. The analysis showed Greek males had more sexual partners than non-Greek males. Regarding anal sex, women in a sorority were more likely to report having anal sex than those not in a sorority (22% compared to 13.7%).

In a separate study by Vail-Smith, Whetstone, et al. (2010), the authors aimed to determine the prevalence of sexual infidelity and to identify the characteristics of those who
engage in infidelity. Fraternity membership was one of seven characteristics identified as likely predictors of infidelity. In this subgroup, 43.4% of fraternity members reported having intercourse outside of a monogamous relationship compared to 25.1% of males who were not Greek members. Six percent of female Greek members reported having anal intercourse outside of a monogamous relationship as compared to 1.8% of non-Greek females.

**Brief, Single-Session STD Educational Interventions**

Warren (2010) designed a study to determine whether a brief HPV educational intervention targeting college women would improve their knowledge of HPV. The study population consisted of thirty-three females aged 18 to 23 who were enrolled in a private Northeastern Pennsylvania college. IRB approval was obtained and three classes of students were surveyed. Questionnaires, including demographic data regarding age and gender and 7 true-false questions related to HPV, were anonymously completed. Following return of the questionnaires, the students were given a brief educational overview of HPV and its health-related issues. Students were also given an educational handout about HPV. One month following the educational intervention, the students were given the same questionnaire and comparisons were made. Only 28 of the original 33 students were available to answer the second questionnaire. General Linear Model analyses were conducted on the data. Results indicated a significant increase in HPV knowledge one month after a brief educational intervention. This study is rated as Level 6 evidence (Melnyk & Fineout-Overholt, 2011) and supports the implementation of brief educational interventions in increasing knowledge of college females about HPV. The study does not indicate if HPV education impacts safe-sex practices.
In a Level 2 Evidence (Melnyk & Fineout-Overholt, 2011) randomized controlled trial conducted by Diallo et al. (2010), a single-session HIV prevention intervention was evaluated for efficacy. A total of 30 groups of women were recruited for the study. Groups included university dormitory residents, church groups, friendship groups, and social support groups. Groups consisted of a total of 313 African American women with a mean age of 31.3 years. These groups were randomized to attend the Healthy Love Workshop or a comparison workshop. The Healthy Love Workshop is an HIV prevention intervention developed by SisterLove Inc., which is a community-based organization in Atlanta, Georgia. The workshop consists of a single session, lasting 3 to 4 hours. Features of the session include basic education information on HIV and STDs and skills building activities regarding correct condom use. For this study, intervention workshops were held in churches, participants’ homes, on college campuses and in community centers. Results indicated at both the 3- and 6-month follow-up, women who received the Healthy Love Workshop intervention were more likely to report condom use and HIV testing than women who received the comparison intervention.

Moore, Smith, and Folsom (2012) published a study utilizing Information-Motivation-Behavioral (IMB) interventions. The study design was descriptive and considered Level 6 evidence (Melnyk & Fineout-Overholt, 2011). The researchers aimed to determine the efficacy of three brief sexual health interventions for college students. Participants consisted of 302 college students but no other demographics were obtained for the study. Students were placed in one of three IMB intervention groups. The first group viewed an 8-minute video featuring a couple discussing sex and their relationship. The video was followed by a 25-minute discussion about sexual behavior and safe sex methods, HIV and STDs, their symptoms, testing methods, treatments and prevalence. Discussion was followed by a condom demonstration. The second
group received a 35-minute power point lecture covering the same information as the first intervention, followed by a condom demonstration. The third group was instructed to visit at least 3 of 10 provided Web sites with a focus on STDs and prevention. Students who received the two interventions involving class discussion and lecture improved significantly more on sexual health knowledge than those referred to websites only. This study supports having an actual person in charge of the learning process yields greater knowledge gains than referral to websites.

**Combined Alcohol and STD Interventions**

Two studies reviewed utilized interventions that incorporated strategies to reduce drinking as well as risky sexual behaviors (Dermen & Thomas, 2011; Gilmore, Granato, & Lewis, 2013). In the 2011 study conducted by Dermen and Thomas, the effects of interventions focused on drinking risk-reduction, HIV risk-reduction and subsequent drinking, and HIV risk behavior were assessed independently and jointly. The study was a randomized controlled trial, which is ranked as Level 2 evidence (Melynyck & Fineout-Overholt, 2011). The sample consisted of a total of 154 unmarried college students with a mean age of 20.7, the majority of who were female, white, and heterosexual. The participants were randomly assigned to one of three interventions: 1) Alcohol risk-reduction, 2) HIV risk-reduction, or 3) Combined risk-reduction. The interventions consisted of counseling sessions ranging from 75 to 105 minutes. Results indicated an alcohol-focused intervention reduced drinking but had no impact on risky sexual behaviors. In contrast, an HIV-focused intervention was found to impact the frequency of unprotected sex. There was no significant impact of a combined intervention addressing both alcohol use and HIV prevention on either behavior.
Gilmore, et al. (2013) also set out to determine effective interventions regarding alcohol use and risky sexual behavior (RSB). Considered Level 6 evidence (Melnyk and Fineout-Overholt, 2011), the study was descriptive in design and utilized secondary data from a larger, longitudinal study. All participants were college students with a mean age of 20.12. The majority was Caucasian, female, heterosexual and reported being in a monogamous relationship. Participants were surveyed regarding drinking protective behavioral strategies (PBS), condom-related PBS, condom use and alcohol-related sexual activity. Results were analyzed for relationships between these variables. The researchers found condom-related PBS were related to greater condom use, drinking PBS were related to drinking as well as sex-related drinking behavior, and no relationship was found between drinking PBS and condom use.

**Interventions Targeting Condom Use**

Norton, Fisher, Amico, Dovidio, and Johnson (2012) sought to determine effective interventions at increasing condom use in college students. The study design was a randomized control trial and therefore considered Level 2 evidence (Melnyk & Fineout-Overholt, 2011). All participants were heterosexual college students with a mean age of 18.63 and the majority were female, Caucasian, and freshmen or sophomores. Participants were randomly assigned to one of three IMB interventions with a focus on pregnancy, STD or HIV. Results indicated pregnancy and/or STD interventions were more effective in improving condom use than HIV-focused interventions.

Sadovsky, Draudt, and Boch (2014) conducted a systematic review of reviews, which is considered Level 1 evidence (Melnyk & Fineout-Overholt, 2011). This review examined meta-analyses of randomized controlled trials and quasi-experimental studies where behavioral interventions were used to increase condom use and safer sexual practices. The interventions
used included peer education, individual counseling, skills training, HIV/AIDs education, and social and educational support. Eleven reviews showed increased condom use following the intervention and two showed no difference between control and experimental groups. Given the findings of this review were found to be effective in a variety of populations, the evidence is applicable to the clinical question involving STDs in a diverse group of college students.

**STD Screening Intentions**

Factors associated with STD screening and intentions to get tested were evaluated by only one of the reviewed studies. Boudewyns and Paquin (2011) used the theory of planned behavior (TPB) to determine students’ intentions of getting screened for STDs. The study was descriptive in design and thus considered Level 6 evidence (Melnyk & Fineout-Overholt, 2011). Participants consisted of 17 undergraduate students, most of who were Caucasian, female and had a mean age of 20.24. Participants responded to an online questionnaire that elicited information regarding their beliefs and intentions toward STD testing. The researchers found a strong correlation between intenders and the belief that getting tested would be a sign of respect to their partners and would prevent them from spreading STDs to others. These findings suggest educational messages should include information about transmission of STDs, safer sex methods, and persuasive STD-prevention messages to increase the number of students who seek STD screening.

**Synthesis of Evidence**

Although the studies identified through this literature review are different in design and methods, together they offer much insight for the development of an evidence-based educational intervention to increase STD knowledge and intent to practice safe sex behaviors. Interventions reviewed suggest an educational intervention strategy that includes general knowledge of STDs,
safe sexual behaviors, condoms skills training and sexual health beliefs (Boudewyns & Paquin, 2011; Dermen & Thomas, 2011; Diallo, et al., 2010; Gilmore, et al., 2013; Moore & Smith, 2012; Norton, et al., 2012; Sadovsky, 2014; Warren, 2010). As this literature review reveals, there is sufficient high quality evidence to support implementation of a group intervention in Greek society members. Each study addresses interventions that have been found to influence sexual knowledge and risky sexual behavior. Consensus is found in that interventions targeting alcohol and sexual behaviors are not as effective as interventions focusing on sexual behavior alone. All brief STD-focused interventions resulted in increased STD knowledge. Increased condom use was a result of all of interventions placing a focus on skills training.

**Limitations of Current Evidence**

Although there is a plethora of literature indicating the need for a comprehensive educational program for sexual health, there is no all-inclusive educational program that is considered a gold standard. Many researchers have tested various methods of teaching and information to be disseminated through sexual education programs but no standardization of an education program has been established. The lack of standardization makes it difficult for future providers to implement a specific educational program scientifically proven to be effective. As identified in the aims of the proposed translational project, the target population for the intervention is Greek society college students. For the purposes of this translational project, a brief educational STD intervention has been chosen. The three studies identified in the literature review that provided brief educational interventions all resulted in increased STD knowledge and/or safe sex behaviors. Only one of the studies was a Level 2 study (Diallo, et al., 2010). This study was limited in its generalizability as the participants were all African American females with a mean age of 31.3. Therefore, the results may not be generalizable to an ethnically
diverse group of college students ranging in age from 18 to 24. The Warren (2010) study had a sample of females only and the Moore, et al. (2012) study consisted of a majority of females. Therefore, these studies may not be generalizable to fraternities, which consist of all males.

**Strengths of Current Evidence**

The current evidence is strong in that it provides a wealth of evidence-based information specific to the college population and STD prevention. The research provides a basis for determining which educational interventions prove effective in this age group as well as underlying factors such as gender, age, Greek affiliation and common misconceptions about STDs that affect the attitudes regarding behavior change. All of the current evidence is in favor of educating the public, and especially college aged young adults, about STDs and prevention measures. Though the literature varies in its approach to education regarding STDs there is no question that education is key in preventing the spread of STDs. There is strong expert and literature evidence that supports providing comprehensive STD education focusing on safe sex behaviors instead of abstinence.

**Conclusion**

In conclusion, this literature review adds to the understanding that all college students are considered vulnerable to the risk of STDs as established by statistics and the commonality of risky sexual behaviors. However, Greek society members as a subgroup of the college population have been identified as being at an increased risk due to peer perceptions, societal norms, alcohol use and infidelity. Also, interventions focusing on education and condom use have proven to be effective in decreasing STD incidence. Therefore, a STD educational intervention for Greek society members focusing on provision of STD knowledge and condom
use should impact the incidence and prevalence of STDs in this group and will therefore be included in the current translational project.
Chapter III

Methodology

The current study aimed to determine the STD educational needs of college Greek society students and develop an appropriate educational intervention that is easily replicable and applicable to all college students. The study targeted Greek society college students for two reasons: 1) this group has been shown in the literature to be at high risk for STDs and 2) Greek society members could be influential in future development and implementation of a campus-wide campaign for STD prevention.

This study used a pre-test/ post-test design to determine the impact of a single-session educational intervention on STD knowledge and intentions towards practicing safe sex behaviors among Greek society college students. The pre-test was administered in person by the researcher immediately prior to the educational intervention. Post-tests were administered one week following the educational intervention via email using Qualtrics, the university’s survey system.

Protection of Human Subjects

The protection of human rights was ensured by following the basic ethical principles of respect for persons, beneficence and justice as set forth by the United States Department of Health and Human Services in the Belmont Report (1979). In regards to respect for persons, participants were allowed to enter into the study voluntarily and with adequate information. Informed consent was obtained. All participants in the study were adults between the ages of 18-24, and therefore assent was not needed. Beneficence was upheld by protecting participants from any harm as a result of the study and by maximizing the possible benefits to participants as a result of their participation. Demographic data collected included the use of alcohol or drugs. Due to some participants being under the legal drinking age, their admission to alcohol
consumption does relate to illegal activities. Similarly, participants’ admission to drug use relates to illegal activities. However, due to the anonymity involved in the collection of data, the participants who admit to these illegal activities were not identifiable will therefore suffered no harmful consequences. Therefore, all participants were protected from any potentially harmful future use of the data collected in this research. Allowing all students to choose whether or not to participate in the study ensured the principle of justice. Furthermore, obtaining Institutional Review Board (IRB) approval ensured the protection of human subjects. All data gathered during the study was double-locked for hard copies and password protected and encrypted for electronic copies. Only the researcher had access to individual identifiers during the study, and all information is reported anonymously. All data will be destroyed two years following completion of the study.

There was no foreseen physical harm that could result from the study. However, participants could have experienced emotional distress during the educational intervention or completion of the post-intervention questionnaires. To the researcher’s knowledge, this did not occur. However, the researcher offered to provide brief counseling and/or refer any participant to their primary care provider as appropriate for further follow-up if distress should occur. The researcher’s contact information was provided to participants in the event that any participant should wish to discuss any concerns or distress after the educational intervention. Attempts were made to reduce the risk of emotional distress by stressing to participants that participation in the study was strictly voluntary and that those who wish to participate were able to do so at their convenience and in private so as to avoid any distress that may occur if the questions were answered in a large group.
Participants were not compensated for participation in the study. However, an incentive in the form of a drawing for twenty-five $10 gift cards to Starbucks was offered to those students who completed both the educational intervention and the one-week post-test. There may be an intrinsic incentive for each participant in knowing he or she will be assisting to make the college campus a safe sex environment. The study participants also benefited by gaining knowledge regarding STDs and safe sex practices. Furthermore, participants received the benefit of achieving requirements of Greek chapters to attend an educational training.

An informed consent form was provided and explained to all participants at the start of the educational intervention. The researcher’s name and contact information was provided for participants’ questions regarding the study. Participants were instructed they could withdraw from the study at any time without penalty.

**Instruments**

Baseline data was gathered at the start of the educational intervention in the form of a demographic survey, an STD knowledge questionnaire and an STD attitude scale. An identifier number was assigned to each participant during the educational intervention so that all pre-and post-test data could be linked together for statistical analysis purposes. This identifier number appeared on the informed consent form and each questionnaire but was only available to the researcher. The researcher wrote the participant’s identifier number on the back of her business card so the participant would have his or her number when completing the post-test questionnaires. The knowledge questionnaire and attitude scale survey were administered again one week following the educational intervention via Qualtrics, which is the University’s online survey tool. Participants could choose to enter a drawing for one of twenty-five $10 Starbucks
gift cards at the completion of all questionnaires. The University’s email system was used for participants to enter the drawing, and the email system is password protected.

**Knowledge**

The baseline and one-week post education STD knowledge of Greek college students was assessed using the Sexually Transmitted Disease Knowledge Questionnaire (STD-KQ) developed by Jaworski and Carey (See Appendix A) (2007). This 27-item true or false test is intended to comprehensively measure college students’ STD knowledge regarding six common STDs (chlamydia, genital herpes, gonorrhea, hepatitis B, HIV and HPV). If students were unsure of the answer they were encouraged to select the “don’t know” option. Total scoring ranges from 0 to 27, with higher total scores indicating greater STD knowledge. Correct answers receive a score of “1”, and incorrect or “don’t know” answers receive a score of “0”, and all items are summed to create the total score. The STD-KQ has previously demonstrated an internal consistency of $r = .86$ and a test-retest reliability of $r = .88$, $p < .01$ after a 2-week period (Jaworski & Carey, 2007). Convergent validity, when compared to a similar tool regarding knowledge of HIV, is $r = .64$, $p < .01$ (Jaworski & Carey, 2007).

**Attitudes**

The baseline and one-week post education measurement of attitudes to practice safe sex behaviors were gathered using the STD Attitude Scale (See Appendix B) developed by Yarber, Torabi, and Veenker (1988). This 27-item scale uses a 5-point Likert-type format to measure the three components of young adults’ attitudes: beliefs, feelings, and intentions to act toward STDs with answers ranging from strongly agree, agree, undecided, disagree, and strongly disagree (Davis, Yarber, Bauserman, Schreer, & Davis, 1998). The questions are divided into three subscales reflecting the attitude components. Questions 1 through 9 are measures of the belief
subscale, items 10 through 18 comprise the feeling subscale, and statements 19 through 27 make up the intention to act subscale. When scoring, “higher subscale or total scale scores are interpreted as reflecting an attitude that predisposes one toward high-risk STD behavior, and lower scores predispose the person toward low-risk STD behavior” (Davis, et al., 1998). The STD Attitude Scale has previously shown a five to seven day test-retest reliability of .71. The authors report adequate total scale reliability; Cronbach’s alpha for the total scale was .73, for the belief subscale = .53, the feeling subscale = .48, and the intention to act subscale = .71. Validity of the scale is evident in that scores showed improvement from pre-test to post-test following STD education in secondary school students (Davis, et al., 1998). The tool was developed for and used in the assessment of a CDC STD educational program.

**Demographics**

Demographic data was collected using a form created by the researcher (See Appendix C). Data gathered with the demographic form included gender, age, year in college, sexual orientation, number of sexual partners in past year, number of sexual partners in lifetime, ethnicity, living situation, previous STD diagnosis, relationship status, type of contraception/protection used at last intercourse, number of alcohol beverages consumed in a typical week, and number of times illicit drugs have been used in past month. The demographic data allowed the researcher to ascertain those students who are most at risk of STDs based on their knowledge of STDs and their attitudes and intentions toward STDs.

**Recruitment**

The researcher worked closely with the director of Greek life to recruit all Greek members (Sororities and Fraternities) for the study. Contact information for each Greek chapter leader was obtained from the director. All group chapter leaders were invited via email to
participate in the study. If no response was received within one week, the researcher attempted to contact chapter leaders up to a total of three times via email, phone, or face-to-face interaction. Leaders were asked to first discuss the study and educational intervention with their chapter members and determine an interest in participation. In this manner, participation in the pilot study was voluntary. If the chapter chose to participate in the study, the Greek leaders were asked to schedule a date during March or April of 2015 for the educational intervention to take place. The researcher also attended a resource fair offered to all leaders of Greek chapters where she was able to personally invite them to participate in the study. A flier advertising the STD educational program, along with the researcher’s contact information, was provided in the initial contact email and at the resource fair (See Appendix D).

**Curriculum Design**

The STD educational intervention corresponded to the constructs of the TPB in which intentions to implement safe sex practices are a reflection of the individual’s behavioral, normative, and perceived control beliefs. The education was comprised of face-to-face group discussion, with both lecture and interactive format, approximately thirty minutes in length. The health educator at the university has developed a sexual education presentation over the past ten years with modifications made yearly. For purposes of this study, the program developed by the health educator was used with modifications made to include all information covered by the instrument measuring STD knowledge. The researcher, who is a Family Nurse Practitioner, delivered all educational interventions. Each thirty-minute segment was comprised of a power point lecture highlighting the significance of STD prevalence among college students and offering general STD knowledge and facts. The lecture design was age appropriate and appealing with music, bright colors, animations, and visual images. The discussion began with a
definition of sex and sexual health along with clarification of terms. The focus of the education was on the six most common STDs (chlamydia, genital herpes, gonorrhea, hepatitis B, HIV and HPV) their transmission, consequences of infection, testing, risk reduction, and treatment. A large focus was placed on high-risk behaviors such as unprotected sex, multiple sexual partners, excess alcohol consumption and use of other substances that alter judgment. Common misconceptions regarding infidelity and peer perceptions were also addressed. The education session ended with an open forum for questions and answers. The educational intervention concluded with instructions for completing the post-test questionnaires and a description of the drawing for the Starbuck’s gift cards.

**Analysis Plan**

**Power Analysis**

An a priori power analysis was performed and the minimum required sample size to obtain a small effect size of 0.10 for a Pearson’s correlation coefficient was determined to be 150 (Soper, n.d.). Therefore, the researcher, assuming a 30% attrition rate, aimed to recruit a minimum of 215 participants. The total number of Greek chapters on the campus is 19, with 10 fraternities and 9 sororities. The total number of sorority (female) members is approximately 1,275. The total fraternity (male) membership is estimated at 410. Therefore, the researcher aimed to recruit at least 161 sorority members and 54 fraternity members to complete the study. In this manner, the gender percentage of participants would be representative of the actual Greek membership on campus.

**Data Analysis**

Data was entered and analyzed using SPSS, version 22.0. Descriptive statistics were used to analyze the demographic and behavioral characteristics of the sample. Means and
standard deviations were reported for continuous variables while frequency counts and percentages were reported for nominal and ordinal values. The differences in scores between pre- and post- intervention tests for STD knowledge were calculated and tested for normality of distribution using histograms and measures of skewness and kurtosis. The distribution was found to be normal; therefore, parametric testing in the form of dependent samples t-tests were performed to determine if an increase in knowledge or attitudes toward STDs occurred between the pre-test and post-test scores. Parametric testing in the form of Pearson’s correlation coefficient was performed to determine any correlation between knowledge and attitudes at baseline (pre-test) or following the intervention (post-test). Sexual demographic variables included sexual orientation, number of lifetime partners, previous STD diagnosis, number of alcohol beverages consumed in a typical week, and number of times illegal or prescription drugs used in the past month. The sexual demographic variables were checked for normality of distribution with histograms and scatter plots. For those variables that met the assumption of normal distribution, Pearson’s correlations were performed. For those variables that did not meet the assumption of normal distribution, Spearman’s rho analysis was conducted.
Chapter IV

Results

The results of this descriptive correlational study assessing Greek society college students’ knowledge of STDs and attitudes toward practicing safe sex behaviors are discussed in this chapter. Reported findings include descriptive information concerning participant sexual demographics, pre- and post-test results for knowledge of STDs, and pre- and post-survey results for attitudes toward practicing safe sex behaviors. Reliability of the instruments used and statistical data addressing each of the research questions are also presented.

Data analysis began with examining for missing data and standard data cleaning. There was no missing data found. Correlations were analyzed for all study variables, and no multicolinearity was noted. There was a total of 262 participants who attended the three educational sessions. Of these, 132 completed the study and 130 only completed the pre-intervention questionnaires. A comparison was made, using an independent samples t-test between the two groups and there was no significant difference in STD attitude scores between the group who completed the study (M=55.59, SD=10.42) and the group who did not complete the study (M=56.86, SD = 10.15), $t(260) = 1, p = .318, r = .06$. There was a significant difference in the pre-knowledge scores between the group who completed the study (M=13.03, SD=6.46) and the group who did not complete the study (M=10.99, SD=6.60), $t(256) = -2.51, p = .013, r = .15$. This indicates that those who attended the educational session but did not complete the post-education surveys had less STD knowledge than those who completed the post-education surveys.

Sample Description
A total of 263 participants received the educational intervention and completed the pre-knowledge and pre-attitude surveys. However, only 132 participants completed the post-knowledge and post-attitude surveys, indicating an attrition rate of 50%. All further discussion will include only the 132 participants who completed both pre-intervention and post-intervention surveys.

The mean age of the study population was 19.8 years with a range of 18 to 24 years. The majority of participants were Caucasian (97.7%), female (86.4%), college freshmen (53%), single (47%), and lived off-campus with friends (51.5%) or on campus (42.4%). One hundred percent of the study participants identified as heterosexual. To determine if this was reflective of the university population, a cross-tabulation table was used to analyze university data from the 2013 ACHA-NCHA assessment. None of the Greek students completing the ACHA-NCHA assessment (n=92) identified as homosexual, gay/lesbian, or unsure and only two (2.17%) identified as bisexual (ACHA-NCHA II, 2013).

Table 1

Sample Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>x̄(SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>19.8 (1.2)</td>
<td>18 - 24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>18</td>
<td>13.6</td>
</tr>
<tr>
<td>Female</td>
<td>114</td>
<td>86.4</td>
</tr>
<tr>
<td>Year in College</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>53</td>
<td>40.2</td>
</tr>
<tr>
<td>Sophomore</td>
<td>37</td>
<td>28</td>
</tr>
<tr>
<td>Junior</td>
<td>22</td>
<td>16.7</td>
</tr>
<tr>
<td>Senior</td>
<td>20</td>
<td>15.2</td>
</tr>
</tbody>
</table>

**Ethnicity**

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>2</th>
<th>1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian (Non-Hispanic)</td>
<td>129</td>
<td>97.7</td>
</tr>
<tr>
<td>Asian/ Pacific Islander</td>
<td>1</td>
<td>0.8</td>
</tr>
</tbody>
</table>

**Living Situation**

<table>
<thead>
<tr>
<th>Living Situation</th>
<th>1</th>
<th>0.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraternity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sorority</td>
<td>7</td>
<td>5.3</td>
</tr>
<tr>
<td>On-Campus</td>
<td>56</td>
<td>42.4</td>
</tr>
<tr>
<td>Off-Campus with friends</td>
<td>68</td>
<td>51.5</td>
</tr>
</tbody>
</table>

**Relationship Status**

<table>
<thead>
<tr>
<th>Relationship Status</th>
<th>16</th>
<th>47</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td>Casually Dating</td>
<td>19</td>
<td>14.4</td>
</tr>
<tr>
<td>Committed Relationship</td>
<td>51</td>
<td>38.6</td>
</tr>
</tbody>
</table>

**Clinical Questions**

**Clinical Question 1**: How does an STD educational intervention affect knowledge among Greek society college students?

A dependent samples t-test was used to test the hypothesis that Greek society college students participating in an STD educational session would have increased STD knowledge from baseline to one week. The research hypothesis was supported. A significant increase in STD
knowledge was demonstrated from baseline \((M=13.03, SD=6.5)\) to one week \((M=20.27, SD=4.9)\) \(t(131) = -13.53, p = .000\).

When comparing individual items pre-test and post-test, the percentage of participants who answered each item correctly increased with every item except item number seven. The percentage of correct responses to item number seven actually decreased from pre-test to post-test indicating participants did not understand the material presented in regards to item number seven.

Table 2

**STD-KQ Items and Percentage of Participants Answering Each Item Correctly at Pre-test and Post-test**

<table>
<thead>
<tr>
<th>Item</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Genital herpes is caused by the same virus as HIV.</td>
<td>40.2</td>
<td>56.8</td>
</tr>
<tr>
<td>2. Frequent urinary infections can cause Chlamydia.</td>
<td>44.7</td>
<td>75.8</td>
</tr>
<tr>
<td>3. There is a cure for Gonorrhea.</td>
<td>42.4</td>
<td>72.7</td>
</tr>
<tr>
<td>4. It is easier to get HIV if a person has another Sexually Transmitted Disease.</td>
<td>46.2</td>
<td>65.2</td>
</tr>
<tr>
<td>5. Human Papillomavirus (HPV) is caused by the same virus that causes HIV.</td>
<td>22.7</td>
<td>54.5</td>
</tr>
<tr>
<td>6. Having anal sex increases a person’s risk of getting Hepatitis B.</td>
<td>40.9</td>
<td>75.0</td>
</tr>
<tr>
<td>7. Soon after infection with HIV a person develops open sores on his or her genitals (penis or vagina).</td>
<td>72.7</td>
<td>67.4</td>
</tr>
<tr>
<td>8. There is a cure for Chlamydia.</td>
<td>43.9</td>
<td>74.2</td>
</tr>
<tr>
<td>9. A woman who has Genital Herpes can pass the infection to her baby during childbirth.</td>
<td>59.8</td>
<td>90.2</td>
</tr>
<tr>
<td>10. A woman can look at her body and tell if she has Gonorrhea.</td>
<td>52.3</td>
<td>91.7</td>
</tr>
</tbody>
</table>
11. The same virus causes all of the Sexually Transmitted Diseases.
12. Human Papillomavirus (HPV) can cause genital warts.
13. Using a natural skin (lambskin) condom can protect a person from getting HIV.
14. Human Papilloma Virus (HPV) can lead to cancer in women.
15. A man must have vaginal sex to get Genital Warts.
16. Sexually Transmitted Diseases can lead to health problems that are usually more serious for men than women.
17. A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina.
18. If a person tests positive for HIV the test can tell how sick the person will become.
19. There is a vaccine available to prevent a person from getting Gonorrhea.
20. A woman can tell by the way her body feels if she has a Sexually Transmitted Disease.
21. A person who has Genital Herpes must have open sores to give the infection to his or her sexual partner.
22. There is a vaccine that prevents a person from getting Chlamydia.
23. A man can tell by the way his body feels if he has Hepatitis B.
24. If a person had Gonorrhea in the past he or she is immune (protected) from getting it again.
25. Human Papillomavirus (HPV) can cause HIV.
26. A man can protect himself from getting Genital Warts by washing his genitals after sex.
27. There is a vaccine that can protect a person from getting Hepatitis B.

**Clinical Question 2:** How does an STD educational intervention affect attitudes toward safe sex behaviors among Greek society college students?

A dependent samples $t$-test was used to test the hypothesis that Greek society college students participating in an STD educational session would have increased attitudes toward safe
sex behaviors from baseline to one week. The research hypothesis was not supported. Attitudes toward safe sex behaviors were similar at baseline ($M=55.59$, $SD=10.42$) and one week following the educational session ($M=55.39$, $SD=12.83$) $t$ (131) = .223, $p$ = .000.

Table 3

*STD Attitude Scale and Percentage Responses Pre- and Post-Intervention*

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly Agree (Pre-%, Post-%)</th>
<th>Agree (Pre-%, Post-%)</th>
<th>Undecided (Pre-%, Post-%)</th>
<th>Disagree (Pre-%, Post-%)</th>
<th>Strongly Disagree (Pre-%, Post-%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How one uses his/her sexuality has nothing to do with STD.</td>
<td>11.4, 9.8</td>
<td>22</td>
<td>39.4, 17.4</td>
<td>9.8, 20.5</td>
<td>17.4, 31.1</td>
</tr>
<tr>
<td>2. It is easy to use the prevention methods that reduce one’s chances of getting an STD.</td>
<td>56.8, 36.4</td>
<td>3</td>
<td>2.3, 1.5</td>
<td>52.3, 40.2</td>
<td>6.1, 0</td>
</tr>
<tr>
<td>3. Responsible sex is one of the best ways of reducing the risk of STD.</td>
<td>62.1, 31.1</td>
<td>3.8</td>
<td>2.3, 0.8</td>
<td>60.6, 28.8</td>
<td>7.6, 2.3</td>
</tr>
<tr>
<td>4. Getting early medical care is the main key to preventing harmful effects of STD.</td>
<td>47.7, 40.2</td>
<td>9.1</td>
<td>2.4, 0.8</td>
<td>47.7, 35.6</td>
<td>12.2, 4.5</td>
</tr>
<tr>
<td>5. Choosing the right sex partner is important in reducing the risk of getting an STD.</td>
<td>50.0, 39.4</td>
<td>4.5</td>
<td>6.1, 0</td>
<td>51.5, 33.3</td>
<td>7.6, 5.3</td>
</tr>
<tr>
<td>6. A high rate of STD should be a concern for all people.</td>
<td>50</td>
<td>10.6</td>
<td>3.0, 0</td>
<td>59.8, 26.5</td>
<td>9.8, 3.8</td>
</tr>
<tr>
<td>7. People with an STD have a duty to get their sex partners to medical care.</td>
<td>50.0, 34.1</td>
<td>11.4</td>
<td>50.0, 34.8</td>
<td>13.6, 1.5</td>
<td>0</td>
</tr>
<tr>
<td>8. The best way to get a sex partner to STD treatment is to take</td>
<td>23.5, 42.4</td>
<td>21.2</td>
<td>11.4, 1.5</td>
<td>23.5, 42.4</td>
<td>21.2, 11.4</td>
</tr>
<tr>
<td>Proposition</td>
<td>37.1</td>
<td>36.4</td>
<td>18.2</td>
<td>8.3</td>
<td>0</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>-----</td>
<td>----</td>
</tr>
<tr>
<td>9. Changing one's sex habits is necessary once the presence of an STD is known.</td>
<td>59.1</td>
<td>28.0</td>
<td>12.1</td>
<td>0.8</td>
<td>0</td>
</tr>
<tr>
<td>10. I would dislike having to follow the medical steps for treating an STD.</td>
<td>61.4</td>
<td>26.5</td>
<td>10.6</td>
<td>1.5</td>
<td>0</td>
</tr>
<tr>
<td>11. If I were sexually active, I would feel uneasy doing things before and after sex to prevent getting an STD.</td>
<td>9.8</td>
<td>16.7</td>
<td>17.4</td>
<td>31.8</td>
<td>24.2</td>
</tr>
<tr>
<td>12. If I were sexually active, it would be insulting if a sex partner suggested we use a condom to avoid STD.</td>
<td>9.8</td>
<td>17.4</td>
<td>25.0</td>
<td>24.2</td>
<td>22.7</td>
</tr>
<tr>
<td>13. I dislike talking about STD with my peers.</td>
<td>3.8</td>
<td>6.8</td>
<td>16.7</td>
<td>37.1</td>
<td>35.6</td>
</tr>
<tr>
<td>14. I would be uncertain about going to the doctor unless I was sure I had an STD.</td>
<td>2.3</td>
<td>6.1</td>
<td>7.6</td>
<td>21.2</td>
<td>62.9</td>
</tr>
<tr>
<td>15. I would feel that I should take my sex partner with me to a clinic if I thought I had an STD.</td>
<td>6.1</td>
<td>8.3</td>
<td>11.4</td>
<td>22.0</td>
<td>52.3</td>
</tr>
<tr>
<td>16. It would be embarrassing to discuss STD with one's partner if one were sexually active.</td>
<td>9.1</td>
<td>25.8</td>
<td>33.3</td>
<td>23.5</td>
<td>8.3</td>
</tr>
<tr>
<td>17. If I were to have sex, the chance of getting an STD makes me uneasy about having sex with more than one person.</td>
<td>8.3</td>
<td>20.5</td>
<td>37.9</td>
<td>23.5</td>
<td>9.8</td>
</tr>
<tr>
<td>18. I like the idea of sexual abstinence (not having sex).</td>
<td>8.3</td>
<td>27.3</td>
<td>18.2</td>
<td>31.1</td>
<td>15.2</td>
</tr>
<tr>
<td></td>
<td>6.8</td>
<td>28.8</td>
<td>21.2</td>
<td>34.1</td>
<td>9.1</td>
</tr>
<tr>
<td></td>
<td>25.8</td>
<td>36.4</td>
<td>21.2</td>
<td>14.4</td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>21.2</td>
<td>38.6</td>
<td>25.8</td>
<td>11.4</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>6.8</td>
<td>28.8</td>
<td>19.7</td>
<td>32.6</td>
<td>12.1</td>
</tr>
<tr>
<td></td>
<td>9.1</td>
<td>29.5</td>
<td>21.2</td>
<td>32.6</td>
<td>7.6</td>
</tr>
<tr>
<td></td>
<td>28.8</td>
<td>46.2</td>
<td>12.1</td>
<td>12.1</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>43.9</td>
<td>37.1</td>
<td>12.9</td>
<td>4.5</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>22.7</td>
<td>22.7</td>
<td>28.0</td>
<td>18.9</td>
<td>6.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>19. If I had an STD, I would cooperate with public health persons to find the sources of STD.</td>
<td>46.2</td>
<td>43.9</td>
<td>9.1</td>
<td>0.8</td>
<td>0</td>
</tr>
<tr>
<td>20. If I had an STD, I would avoid exposing others while I was being treated.</td>
<td>65.2</td>
<td>25.0</td>
<td>6.1</td>
<td>1.5</td>
<td>2.3</td>
</tr>
<tr>
<td>21. I would have regular STD checkups if I were having sex with more than one person.</td>
<td>41.7</td>
<td>38.6</td>
<td>16.7</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>22. I intend to look for STD signs before deciding to have sex with anyone.</td>
<td>31.8</td>
<td>43.9</td>
<td>20.5</td>
<td>3.8</td>
<td>0</td>
</tr>
<tr>
<td>23. I will limit my sex activity to just one partner because of the chances I might get an STD.</td>
<td>47.0</td>
<td>30.3</td>
<td>14.4</td>
<td>7.6</td>
<td>0.8</td>
</tr>
<tr>
<td>24. I will avoid sex contact anytime I think there is even a slight chance of getting an STD.</td>
<td>43.9</td>
<td>31.8</td>
<td>17.4</td>
<td>5.3</td>
<td>1.5</td>
</tr>
<tr>
<td>25. The chance of getting an STD would not stop me from having sex.</td>
<td>3.8</td>
<td>9.1</td>
<td>18.2</td>
<td>31.8</td>
<td>37.1</td>
</tr>
<tr>
<td>26. If I had a chance, I would support community efforts toward controlling STD.</td>
<td>28.0</td>
<td>47.7</td>
<td>21.2</td>
<td>3.0</td>
<td>0</td>
</tr>
<tr>
<td>27. I would be willing to work with others to make people aware of STD problems in my town.</td>
<td>22.7</td>
<td>32.6</td>
<td>35.6</td>
<td>6.1</td>
<td>3.0</td>
</tr>
</tbody>
</table>
Table 4

*Dependent Samples t-test for STD Knowledge and STD Attitudes*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\bar{x}$ (SD)</th>
<th>Possible Range</th>
<th>Actual Range</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>STD Knowledge Pre-intervention</td>
<td>13.03 (6.5)</td>
<td>0 - 27</td>
<td>0 - 26</td>
<td>.000</td>
</tr>
<tr>
<td>STD Knowledge Post-intervention</td>
<td>20.27 (4.9)</td>
<td>0 - 27</td>
<td>0 - 27</td>
<td></td>
</tr>
<tr>
<td>STD Attitude Pre-intervention</td>
<td>55.55 (10.42)</td>
<td>0 - 135</td>
<td>35 - 81</td>
<td>.948</td>
</tr>
<tr>
<td>STD Attitude Post-intervention</td>
<td>55.49 (12.75)</td>
<td>0 - 135</td>
<td>30 - 95</td>
<td></td>
</tr>
</tbody>
</table>

Table 5

*Sexual Demographics*

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexual Orientation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterosexual</td>
<td>132</td>
<td>100</td>
</tr>
<tr>
<td>Homosexual</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Previous STI Diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlamydia</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>HPV</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
## Clinical Question 3

Is there a relationship between sexual demographic factors (ie, sexual orientation, number of lifetime oral, vaginal, and anal partners, number of oral, vaginal, and anal partners in the past year, previous STD diagnosis, number of alcohol beverages consumed in a typical week, and number of illegal or prescription drugs used in past month) and STD knowledge pre- and post- educational intervention?

The scale variables of number of lifetime anal, oral, and vaginal partners, number of anal, oral, and vaginal partners in the past year, number of alcohol beverages consumed in a typical week, and number of illegal or prescription drugs used in the past month, were not normally distributed therefore, Spearman’s rank order analysis was used to determine relationships between these variables and STD knowledge pre- and post- intervention.
The hypothesis was partially supported. There was a significant negative relationship between number of alcohol beverages consumed in a typical week and pre-STD knowledge, $r_s (132) = -.176, p = .044$. In this sample, participants who consumed more alcohol were likely to have less knowledge regarding STDs prior to the educational intervention.

There were no other significant relationships found between pre-STD knowledge and sexual demographics. There was no significant relationship between number of lifetime anal partners and pre-STD knowledge $r_s (132) = .029, p = .745$, number of lifetime oral partners and pre-STD knowledge $r_s (132) = .097, p = .270$, number of lifetime vaginal partners and pre-STD knowledge $r_s (132) = .091, p = .297$, number of anal partners in the past year and pre-STD knowledge $r_s (132) = .075, p = .391$, number of oral partners past year and pre-STD knowledge $r_s (132) = .057, p = .519$, number of vaginal partners past year and pre-STD knowledge $r_s (132) = .114, p = .192$, and number of times illegal or prescription drugs used in past month and pre-STD knowledge, $r_s (132) = -.153, p = .080$.

There were no significant relationships found between post-STD knowledge and sexual demographics. There was no significant relationship between number of lifetime anal partners and post-STD knowledge $r_s (132) = .089, p = .310$, number of lifetime oral partners and post-STD knowledge $r_s (132) = .145, p = .098$, number of lifetime vaginal partners and post-STD knowledge $r_s (132) = .144, p = .099$, number of anal partners in the past year and post-STD knowledge $r_s (132) = .096, p = .274$, number of oral partners past year and post-STD knowledge $r_s (132) = .105, p = .230$, number of vaginal partners past year and post-STD knowledge $r_s (132) = .147, p = .093$, number of alcohol beverages consumed in a typical week and post-STD knowledge, $r_s (132) = -.009, p = .916$, and number of times illegal or prescription drugs used in past month and post-STD knowledge, $r_s (132) = -.148, p = .091$. 
Chi square analysis was attempted to determine correlation between sexual orientation and STD knowledge pre- and post-educational intervention. However, because 100% of the participants were heterosexual, the independent variable of sexual orientation did not meet the cell frequency assumption and could not be analyzed. Similarly, chi square analysis was attempted to determine correlation between STD knowledge pre- and post-intervention and previous STD diagnosis. However, because none of the participants reported a previous STD diagnosis, the independent variable of previous STD diagnosis did not meet the cell frequency assumption and could not be analyzed.

**Clinical Question 4:** Is there a relationship between sexual demographic factors (ie, sexual orientation, number of lifetime anal, oral, and vaginal partners, previous STD diagnosis, number of alcohol beverages consumed in a typical week, and number of times illegal or prescription drugs used in past month) and attitudes toward practicing safe sex behaviors pre- and post-educational intervention?

The scale variables of number of lifetime anal, oral, and vaginal partners, number of anal, oral, and vaginal partners in the past year, number of alcohol beverages consumed in a typical week, and number of illegal or prescription drugs used in the past month, were not normally distributed therefore, Spearman’s rank order analysis was used to determine relationships between these variables and attitudes toward practicing safe sex behaviors.

The hypothesis was partially supported. There was a significant positive relationship between number of lifetime oral partners and pre-intervention attitudes $r_{s}(132) = .219, p = .012$. This correlation was also significant with Pearson’s, $r = .177, p = .042$. As participants’ number of oral partners in their lifetime increased, pre-intervention attitudes toward risky sexual behaviors also increased. There was a significant positive relationship between number of
lifetime vaginal partners and pre-intervention attitudes $rs(132) = .192, p = .027$. This correlation was also significant with Pearson’s, $r(132) = .218, p = .012$. As participants’ number of lifetime vaginal partners increased, their pre-intervention attitudes toward risky sexual behaviors also increased. There was a significant positive relationship between number of oral partners past year and pre-intervention attitudes $rs(132) = .205, p = .018$. This correlation was also significant with Pearson’s $r(132) = .184, p = .035$. As participants’ number of oral partners in the past year increased, their pre-intervention attitudes toward risky sexual behaviors also increased. There was a significant positive relationship between number of alcohol beverages consumed in a typical week and pre-intervention attitudes $rs(132) = .309, p = .000$. This correlation was also significant with Pearson’s $r(132) = .407, p = .000$. As participants’ number of alcohol beverages consumed in a typical week increased, their pre-intervention attitudes toward risky sexual behaviors also increased. There was a significant positive relationship between number of illegal or prescription drugs used in the past month and pre-intervention attitudes $rs(132) = .320, p = .000$. This correlation was also significant with Pearson’s $r(132) = .186, p = .035$. As participants’ number of illegal or prescription drugs used in the past month increased, their pre-intervention attitudes toward risky sexual behavior also increased.

There was a significant positive relationship between number of lifetime oral partners and post-intervention attitudes $rs(132) = .208, p = .017$. As participants’ number of lifetime oral partners increased, post-intervention attitudes toward risky sexual behaviors also increased. There was a significant positive relationship between number of lifetime vaginal partners and post-intervention attitudes $rs(132) = .199, p = .022$. As participants’ number of lifetime vaginal partners increased, their post-intervention attitudes toward risky sexual behaviors also increased. There was a significant positive relationship between number of oral partners past year and post-
intervention attitudes $rs(132) = .194, p = .025$. This correlation was also significant with Pearson’s $r(132) = .184, p = .035$. As participants’ number of oral partners in the past year increased, their post-intervention attitudes toward risky sexual behaviors also increased. There was a significant positive relationship between number of alcohol beverages consumed in a typical week and post-intervention attitudes $rs(132) = .232, p = .007$. As participants’ number of alcohol beverages consumed in a typical week increased, their post-intervention attitudes toward risky sexual behaviors also increased. There was a significant positive relationship between number of illegal or prescription drugs used in the past month and post-intervention attitudes $rs(132) = .303, p = .000$. As participants’ number of illegal or prescription drugs used in the past month increased, their post-intervention attitudes toward risky sexual behavior also increased.

There were no significant relationships found between pre- and post- attitudes and number of anal partners, lifetime or past year. There was no significant relationship between number of lifetime anal partners and pre-intervention attitudes $rs(132) = .120, p = .172$, number of lifetime anal partners and post-intervention attitudes $rs(132) = .002, p = .983$, number of anal partners in the past year and pre-intervention attitudes $rs(132) = .142, p = .104$, and number of anal partners in the past year and post-intervention attitudes $rs(132) = -.002, p = .980$.

There were no significant relationships found between pre- and post- attitudes and number of vaginal partners past year. There was no significant relationship between number of vaginal partners past year and pre-intervention attitudes $rs(132) = .142, p = .104$, and number of vaginal partners past year and post-intervention attitudes $rs(132) = .163, p = .062$.

Chi square analysis was attempted to determine correlation between attitudes toward practicing safe sex behaviors pre- and post-intervention and sexual orientation. However,
because 100% of the sample was heterosexual, the independent variable of sexual orientation did not meet the cell frequency assumption and could not be analyzed. Similarly, chi square analysis was attempted to determine correlation between attitudes toward practicing safe sex behaviors pre- and post-intervention and previous STD diagnosis. However, because none of the participants reported previous STD diagnosis, this independent variable did not meet the cell frequency assumption and could not be analyzed.

Table 6

*Spearman’s Rho Analysis*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-Knowledge</th>
<th>Post-Knowledge</th>
<th>Pre-Attitude</th>
<th>Post-Attitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifetime anal</td>
<td>.029</td>
<td>.089</td>
<td>.120</td>
<td>.002</td>
</tr>
<tr>
<td>Lifetime oral</td>
<td>.097</td>
<td>.145</td>
<td>.219*</td>
<td>.208*</td>
</tr>
<tr>
<td>Lifetime vaginal</td>
<td>.091</td>
<td>.144</td>
<td>.192*</td>
<td>.199*</td>
</tr>
<tr>
<td>Anal partners</td>
<td>.075</td>
<td>.096</td>
<td>.142</td>
<td>-.002</td>
</tr>
<tr>
<td>Oral partners</td>
<td>.057</td>
<td>.105</td>
<td>.205*</td>
<td>.194*</td>
</tr>
<tr>
<td>Vaginal partners</td>
<td>.114</td>
<td>.147</td>
<td>.142</td>
<td>.163</td>
</tr>
<tr>
<td># Etoh beverages</td>
<td>-.176*</td>
<td>-.009</td>
<td>.309**</td>
<td>.232**</td>
</tr>
</tbody>
</table>

typical week
# illegal/Rx

<table>
<thead>
<tr>
<th></th>
<th>.153</th>
<th>-.148</th>
<th>.320**</th>
<th>.303**</th>
</tr>
</thead>
</table>

 drugs past month

n = 132

* p<.05

**p<.001

Miscellaneous Findings not Associated with Clinical Questions

Data analysis revealed several significant findings that were not specifically addressed by the research questions. For example, an independent samples t-test revealed that males had a significantly higher pre-educational STD attitude score (M=64.39, SD=10.26) than females (M=54.20, SD=9.78), \( t(130) = -4.08, p = .000, r = 0.34 \). This indicates that male Greek society college students were significantly more likely to report higher attitudes towards risky sexual behavior prior to the educational session than female Greek society students. There was no significance difference found in the post-education STD attitude score between males (M=58.94, SD=12.46) and females (M=54.82, SD=12.85), \( t(130) = -1.269, p = .207, r = .11 \), indicating that these males were able to benefit from the educational session and that their attitudes toward safe sex behaviors improved as a result.

Spearman’s rho analysis revealed a significant positive relationship between number of vaginal partners in past year and number of oral partners in past year \( rs(132) = .771, p = .000 \). This correlation was also significant with Pearson’s analysis \( r(132) = .824, p = .000 \). Greek society college students who report higher numbers of vaginal partners are significantly more likely to also report higher numbers of oral partners.

Spearman’s rho analysis revealed a significant positive relationship between number of anal partners in the past year and number of vaginal partners in the past year, \( rs(132) = .190, p = \)
This correlation was also significant with Pearson’s analysis, \( r(132) = .183, p = .035 \).

Greek society college students who report higher numbers of vaginal partners are significantly more likely to also report higher numbers of anal partners.

Spearman’s rho analysis revealed a significant positive relationship between the number of lifetime vaginal and lifetime oral partners \( rs(132) = .788, p = .000 \). This correlation was also significant with Pearson’s analysis, \( r(132) = .761, p = .000 \). Greek society college students who report higher numbers of lifetime vaginal partners are significantly more likely to also report higher numbers of lifetime oral partners.

Spearman’s rho analysis revealed a significant positive relationship between the number of lifetime anal partners and the number of lifetime vaginal partners, \( rs(132) = .228, p = .009 \). This correlation was also significant with Pearson’s, \( r(132) = .309, p = .009 \). Greek society college students who report higher numbers of lifetime vaginal partners are significantly more likely to also report higher numbers of lifetime anal partners.

Spearman’s rho analysis revealed a significant positive relationship between the number of alcohol beverages consumed in a typical week and the number of illegal or prescription drugs used in the past month, \( rs(132) = .448, p = .000 \). This correlation was also significant with Pearson’s analysis, \( r(132) = .368, p = .000 \). Greek society college students who report higher consumption of alcoholic beverages are significantly more likely to also report higher use of illegal or prescription drugs in the past month.

In determining if there was a relationship between STD knowledge and attitudes toward practicing safe sex behaviors, the scores for the pre- and post-STD knowledge questionnaire and the scores for the pre-and post-attitude survey were analyzed. The data were examined and
found to be normally distributed using both histograms and scatterplots; therefore Pearson’s correlation was used to analyze the data.

Pearson’s analysis revealed a significant negative relationship between pre-STD knowledge and pre-intervention attitudes, \( r(132) = -0.249, p = .004 \). Because a higher score on the STD attitude scale indicates attitudes toward high-risk sexual behavior, this finding indicates as knowledge increases, attitudes become more favorable to practicing safe sex behaviors.

Pearson’s analysis revealed a significant negative relationship between post-STD knowledge and pre-intervention attitudes, \( r(132) = -0.186, p = .033 \). This finding indicates that if attitudes are more favorable toward safe sex behaviors pre-STD intervention, participants are more likely to gain further knowledge from the educational intervention.

Pearson’s analysis revealed a significant negative relationship between post-STD knowledge and post-intervention attitudes, \( rs(132) = -0.307, p = .000 \). This indicates that as knowledge increases through the STD intervention, attitudes become more favorable toward safe sex practices.

**Instruments**

STD knowledge was assessed using the STD Knowledge Questionnaire (STD-KQ). Participants answered “true”, “false”, or “do not know” to each of 27 questions. Each correct answer receives a score of “one” with a total possible score of 27. There was no penalty for answering a question incorrectly, so participants were encouraged to choose “do not know” if they were unsure of the answer. Tool reliability pre-intervention in this study was .881 and post-intervention, .841.

Attitudes toward safe sex behaviors were assessed using the STD Attitude Scale. This 27-item survey uses a 5-point Likert scale to assess attitudes toward safe sex behaviors. When
scoring, each question can be scored with a value of 1 to 5 and the total possible score is 135. Higher scores are “interpreted as reflecting an attitude that predisposes one toward high-risk STD behavior, and lower scores predispose the person toward low-risk STD behavior” (Davis, et al., 1998). In this study, pre-intervention tool reliability was .790 and post-intervention tool reliability was .870.
Chapter V

The findings and conclusions of this descriptive correlational study assessing Greek members’ knowledge of STDs and attitudes toward practicing safe sex behaviors are presented in this chapter. Demographics are compared to the overall demographics of the university where the study took place, as well as to national statistics when appropriate. Study outcomes are compared to previous research findings. Study limitations, strengths and implications for future college student health professionals are also discussed.

Participants in the current study were predominantly Caucasian (97.7%), heterosexual (99.2%), and female (86.4%). These demographic statistics are similar to those reported by the American College Health Assessment II (ACHA II) conducted at the university in 2013 (Caucasian-87.0%, heterosexual – 95.0%, and female 80.9%). Furthermore, the gender demographics of this study are representative of the Greek membership at the university, which consists of 76% females and 24% males. Therefore, the current study findings are representative of the university demographics where the study took place. Regarding sexual orientation, the current study consisted of only heterosexual students (100%). The ACHA II revealed 95% of the university population as heterosexual in 2013. Similarly, the 2013 National Health Interview Survey conducted by the United States Department of Health and Human Services (2014) revealed that 96.6% of Americans identify themselves as heterosexual. Therefore, the current study is not entirely representative of the university or the nation in regards to sexual orientation. The findings are more generalizable to heterosexual college student populations.

Clinical Question 1: Knowledge

The STD-KQ (Jaworski & Carey, 2007) was used in the current study to assess college students’ STD knowledge regarding six common STDs (chlamydia, genital herpes, gonorrhea,
hepatitis B, HIV and HPV). Total scoring ranges from 0 to 27, with higher total scores indicating greater STD knowledge. The STD-KQ was used in a study by Toews and Yazedjian (2012) to examine gender differences in college students’ knowledge regarding STDs. The baseline mean score of the STD-KQ in the current study (M=12.96) was similar to that in the Toews and Yazedjian (2012) study (M=13.38), indicating that sexual knowledge among college students is similar.

Previous research has demonstrated that participation in a single, brief, STD educational intervention increases participants’ STD knowledge from baseline (Hawk, 2013; Moore & Smith, 2012; Moore, Smith, & Folsom, 2012; Warren, 2010). The current study establishes increased knowledge from baseline to one week following a single, thirty-minute educational session. Previous studies utilized interventions ranging in length from thirty minutes (Moore & Smith, 2012; Warren, 2010) to fifty minutes (Moore, Smith, & Folsom, 2012) to two hours (Hawk, 2013). These studies showed increased STD knowledge from baseline to immediately post intervention (Moore, Smith, & Folsom, 2012), one week (Moore & Smith, 2012), and three months (Hawk, 2013). The current study adds to previous research, indicating that a single session educational intervention is beneficial in increasing STD knowledge in college students.

**Clinical Question 2: Attitudes**

The STD Attitude scale was used in the current study to measure students’ attitudes toward safe sexual behaviors prior to the educational intervention and one-week post intervention. Potential scoring of the STD attitude scale ranges from 0 to 135, with higher scores indicating attitudes toward high-risk sexual behavior. In this study, there was no significant difference between baseline attitudes and attitudes one-week post intervention. Other research using the STD Attitude scale has revealed significant decreases in attitude scores from pretest to
posttest (Yarber, 1988). In a study conducted by Yarber (1988) with secondary school students in grades 7-12, the pretest mean score was 65.11 and the immediate posttest mean score was 57.68. One major difference in the Yarber (1988) study and the current study is that the Yarber (1988) study consisted of education ranging in length from two 50-minute sessions to six 50-minute sessions. This suggests that a single, brief educational intervention may not have as significant an effect on attitudes as a multiple session intervention. However, the significance in Yarber’s (1988) findings was based on an immediate posttest. These findings did not hold true for the delayed six weeks posttest, indicating that attitudes may change during and immediately following an intervention but tend to return to pre-intervention levels as time passes.

Clinical Question 3: Knowledge and Sexual Demographics

Participants who reported more alcohol consumption in the current study were likely to have less knowledge regarding STDs prior to the educational intervention. Although there are no other research studies found that correlate alcohol use and knowledge of STDs, the theoretical foundation of the current study in the TPB suggests that knowledge guides informed decisions about behaviors (Polonsky, Renzaho, Ferous, & McQuilten, 2013). Many studies have recognized the correlation between alcohol use and risky sexual behaviors (Hickey & Cleland, 2013; Scott-Shelodon, et al, 2010; Turchik et al, 2010; Vail-Smith, Maguire, et al, 2010). Perhaps the lack of knowledge regarding STDs combined with increased alcohol consumption is responsible for increased risky sexual behaviors. However, it is unclear as to why students who consume more alcohol have less knowledge regarding STDs.

Clinical Question 4: Attitudes and Sexual Demographics

The current findings suggest that as the number of oral and vaginal partners increase, the participants’ attitudes toward risky sexual behaviors also increase. Walcott, Chenneville, and
Tarquini (2011) found that participants who report safe sex behaviors also report more positive attitudes and intentions toward safe sex behaviors. Likewise, those who participate in risky sexual behaviors are more likely to report less positive attitudes and intentions toward safe sex behaviors. One can assume that those who exhibit riskier behaviors yet report no history of previous STD or other negative consequence may believe that “it hasn’t happened to me yet, so what I am doing must be okay.”

The current findings suggest that as the number of alcohol beverages consumed in a week and/or the number of illegal or prescription drugs used in the past month increases, attitudes toward risky sexual behaviors also increase. In a study by Parkes, Wight, Henderson, & Hart (2007) it was found that risky sexual behaviors were not determined by substance use alone. Rather, sexual behaviors were affected by multifaceted psychosocial factors including attitudes toward sexual risky behaviors.

**Miscellaneous Findings**

The finding that male Greek society students are more likely to report attitudes toward risky sexual behavior than their female counterparts is consistent with data found in the literature. Males in general have been found to have more permissive attitudes toward casual sex (Boudewyns & Paquin, 2011; Petersen & Hyde, 2010; Toews & Yazdijan, 2012; Walcott, Chenneville, & Tarquini, 2011) and less favorable attitudes toward getting tested for STDs (Boudewyns and Paquin, 2011). These findings are important because young adult males are not seen as frequently as females by a healthcare provider for routine annual exams.

The finding that attitudes toward safe sex behaviors improve as knowledge increases is consistent with previous research (Garcia-Retamero & Cokely, 2015; Walcott, Chenneville, & Tarquini, 2011). Garcia-Retamero and Cokely (2015) found that young adults with high
knowledge scores regarding STDs showed more favorable attitudes toward condom use than those with lower knowledge scores. Similarly, Walcott, et al (2011) found that females who reported comprehensive school-based sex education reported more positive attitudes toward safe sex behaviors. This finding was not replicated in the male participants of their sample.

**Strengths and Limitations**

A unique aspect of this study was its ability to assess the effects of a brief STD educational intervention on the sexual attitudes of participants. While multiple studies have examined college students’ sexual attitudes in relation to sexual knowledge, sociodemographic variables, and behaviors (Luquis, et al., 2012; Martin & Mak, 2013; Reis et al., 2012; Toews & Yazedjian, 2012), only one study was found to evaluate the effects of an STD educational intervention on STD-related attitudes (Yarber & Crosby, 1997). The study conducted by Yarber and Crosby in 1997 is outdated and was performed on high school students after receiving school-based STD curriculum. One recent study was found to compare the effects of an eight-hour STD educational intervention and simple STD messages presented through brochures on attitudes toward condom use but this study does not assess overall STD attitudes (Garcia-Retamero & Cokely, 2015). Therefore, a key strength of the present study is that it identifies the effects of an STD intervention on the overall sexual attitudes of its’ participants. Another unique aspect of the current study is its’ correlation of STD knowledge and alcohol use. No other studies were found that assess STD knowledge and alcohol use. The use of the TPB as a theoretical foundation for the current study along with the use of valid and reliable instruments (STD-KQ and STD Attitude Scale) also lends to its strength. The current study results support that a brief STD educational intervention can increase STD knowledge and improve attitudes toward safe sexual behaviors.
In the current study, a surprising finding was that none of the participants reported a previous STD diagnosis. In a similar study conducted with 4,487 heterosexual college students from 13 community college campuses in California, the rate of STDs reported was 4% (Trieu, Bratton, & Marshak, 2011). It is possible that participants in the current study misreported their STD history, therefore making some analysis not possible. Another possible explanation is that the majority of STDs have no outward symptoms or the symptoms may go unrecognized (Healthy People 2020, 2010). Therefore, it is possible that some of the participants have had an STD but were unaware. Furthermore, the study took place at a single university in the Southeast and the results may not be generalizable to other Greek society college students. Because of the sensitive nature of the questions concerning attitudes toward safe sex behaviors, social desirability bias may have influenced the participants’ responses. Finally, this study is limited to the sexual behaviors of heterosexual students because of the lack of homosexual participants in the study.

**Implications for Practice**

Through this study, sexual health knowledge has been shown to have a relationship to sexual behavior attitudes of both male and female Greek college students. However, males have been shown to have riskier sexual attitudes than their female counterparts; therefore, while both genders can benefit from STD education, male Greek college students must be targeted differently with the specific goal of reducing their risky attitudes towards sex. Furthermore, because male college students are not generally seen by their primary care provider for annual exams as are female students, healthcare providers must determine alternative ways that male college students can be educated regarding STDs and safe sex behaviors. College health educators can work in conjunction with campus offices of Greek life to coordinate STD
educational sessions. While this study focuses on Greek society college students, implications can be instituted toward all college students. College student health centers are in an excellent position to provide sexual health knowledge to all students at every visit through brochures, recorded educational sessions (to play in waiting area), and face-to-face encounters. College health educators must work to provide effective education strategies to improve the sexual health of all college students.

Conclusion

In conclusion, the current study found that a single session educational intervention was beneficial in increasing STD knowledge in college students. Furthermore, the study found that participants who consumed more alcohol were likely to have less knowledge regarding STDs prior to the educational intervention and that male Greek society college students are significantly more likely to report higher attitudes towards risky sexual behavior. Future research should aim to determine factors that affect the sexual attitudes of college students and explore the correlation between alcohol use and STD knowledge. Sexual health education must be a priority for all college health professionals in order to reduce the risky sexual behaviors of college students.
The Sexually Transmitted Disease Knowledge Questionnaire (STD-KQ)

For each statement below, please circle true (T), false (F), or I don’t know (DK). If you don’t know, please do not guess; instead, please circle DK.

<table>
<thead>
<tr>
<th>Statement</th>
<th>True</th>
<th>False</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Genital herpes is caused by the same virus as HIV.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>2. Frequent urinary infections can cause Chlamydia.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>3. There is a cure for Gonorrhea.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>4. It is easier to get HIV if a person has another Sexually Transmitted Disease.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>5. Human Papillomavirus (HPV) is caused by the same virus that causes HIV.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>6. Having anal sex increases a person’s risk of getting Hepatitis B.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>7. Soon after infection with HIV a person develops open sores on his or her genitals (penis or vagina).</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>8. There is a cure for Chlamydia.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>9. A woman who has Genital Herpes can pass the infection to her baby during childbirth.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>10. A woman can look at her body and tell if she has Gonorrhea.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>11. The same virus causes all of the Sexually Transmitted Diseases.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>12. Human Papillomavirus (HPV) can cause genital warts.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>13. Using a natural skin (lambskin) condom can protect a person from getting HIV.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>14. Human Papilloma Virus (HPV) can lead to cancer in women.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>15. A man must have vaginal sex to get Genital Warts.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>16. Sexually Transmitted Diseases can lead to health problems that are usually more serious for men than women.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>17. A woman can tell that she has Chlamydia if she has a bad smelling odor from her vagina.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>18. If a person tests positive for HIV the test can tell how sick the person will become.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>19. There is a vaccine available to prevent a person from getting Gonorrhea.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>20. A woman can tell by the way her body feels if she has a Sexually Transmitted Disease.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
<tr>
<td>21. A person who has Genital Herpes must have open sores to give the infection to his or her sexual partner.</td>
<td>T</td>
<td>F</td>
<td>DK</td>
</tr>
</tbody>
</table>
22. There is a vaccine that prevents a person from getting Chlamydia. **T**
23. A man can tell by the way his body feels if he has Hepatitis B. **F**
24. If a person had Gonorrhea in the past he or she is immune (protected) from getting it again. **T**
25. Human Papillomavirus (HPV) can cause HIV. **F**
26. A man can protect himself from getting Genital Warts by washing his genitals after sex. **T**
27. There is a vaccine that can protect a person from getting Hepatitis B. **F**

Appendix B

STD Attitude Scale

Directions: Please read each statement carefully. STD means sexually transmitted diseases, once called venereal diseases. Record your reaction by marking an “X” through the letter which best describes how much you agree or disagree with the idea.

Use this key:  
SA = Strongly Agree  
A   = Agree  
U   = Undecided  
D   = Disagree  
SD = Strongly Disagree

Example: Doing things to prevent getting an STD is the job of each person.  SA  A  U  D  SD

28. How one uses his/her sexuality has nothing to do with STD.  
29. It is easy to use the prevention methods that reduce one’s chances of getting an STD.  
30. Responsible sex is one of the best ways of reducing the risk of STD.  
31. Getting early medical care is the main key to preventing harmful effects of STD.  
32. Choosing the right sex partner is important in reducing the risk of getting an STD.  
33. A high rate of STD should be a concern for all people.  
34. People with an STD have a duty to get their sex partners to medical care.  
35. The best way to get a sex partner to STD treatment is to take him/her to the doctor with you.  
36. Changing one’s sex habits is necessary once the presence of an STD is known.  
37. I would dislike having to follow the medical steps for treating an STD.  
38. If I were sexually active, I would feel uneasy doing things before and after sex to prevent getting an STD.  
39. If I were sexually active, it would be insulting if a sex partner suggested we use a condom to avoid STD.  
40. I dislike taking about STD with my peers.  
41. I would be uncertain about going to the doctor unless I was sure I really had an STD.  
42. I would feel that I should take my sex partner with me to a clinic if I thought I had an STD.  
43. It would be embarrassing to discuss STD with one’s partner if one were sexually active.  
44. If I were to have sex, the chance of getting an STD makes me uneasy about having sex with more than one person.  
45. I like the idea of sexual abstinence (not having sex) as the best way of avoiding STD.  
46. If I had an STD, I would cooperate with public health persons to find the sources of STD.  
47. If I had an STD, I would avoid exposing others while I was being treated.  
48. I would have regular STD checkups if I were having sex with more than one person.  
49. I intend to look for STD signs before deciding to have sex with anyone.
50. I will limit my sex activity to just one partner because of the chances I might get an STD.
51. I will avoid sex contact anytime I think there is even a slight chance of getting an STD.
52. The chance of getting an STD would not stop me from having sex.
53. If I had a chance, I would support community efforts toward controlling STD.
54. I would be willing to work with others to make people aware of STD problems in my town.

Appendix C

Demographic Data

Gender:
- Male
- Female
- Other

Year in College:
- Sophomore
- Junior
- Senior

Age:

Sexual Orientation:
- Heterosexual
- Homosexual
- Bisexual
- Other

Number of anal sexual partners in past year:

Number of vaginal sexual partners in past year:

Number of oral sexual partners in past year:

Number of anal sexual partners lifetime:

Number of vaginal sexual partners lifetime:

Number of oral sexual partners lifetime:

Was last sexual intercourse (circle all that apply):
- Anal
- Vaginal
- Oral
- Not Applicable

What form of protection or contraception was used at last intercourse?
- Oral Birth Control Pill
- Male Condom
- Female Condom
- Other
None

Ethnicity:
African American
Caucasian (non-Hispanic)
Latino
Asian/Pacific Islander
Native American
Other

Living Situation:
Fraternity
Sorority
On-campus
Off-campus with friends
Off-campus alone
Off-campus with parents
Other

Previous STI diagnosis
Chlamydia  Yes or No
Gonorrhea  Yes or No
Genital Herpes  Yes or No
Human Papilloma Virus  Yes or No
HIV  Yes or No
Hepatitis B  Yes or No

Relationship Status
Married
Single
Casually Dating
Committed Relationship

Number of alcohol beverages consumed in a typical week:

Number of times illegal or mood-altering prescription drugs (ie., marijuana, cocaine, oxycontin, amphetamines) have been used in past month:
Get The Facts

**Myth:** STDs cannot be transmitted through oral sex.

**Fact:** STDs are often transmitted through oral sex.

**Myth:** STDs can only be transmitted when symptoms are present.

**Fact:** Many STDs do not have symptoms and are transmitted regardless.

Statistics

![Graph showing sexually transmitted infections in Baldwin County, GA](www.countyhealthrankings.org(2014))
References


Attitude. 2015. In Merriam Webster.com, Retrieved February 6, 2015, from

http://www.merriam-webster.com/dictionary/attitude


virus prevention-focused intervention on changing sexual risk behavior among young adults. *Journal of American College Health, 60*(8), 574-582.


Vail-Smith, K., Maguire, R., Brinkley, J. & Burke, S. (2010). Sexual behaviors during the first
year of college: An exploratory comparison of first and second semester freshmen.

*American Journal of Sexuality Education, 5*, 171 - 188.


