THE EFFECTS OF SAFE SEX PRACTICE EDUCATION ON KNOWLEDGE AND ATTITUDES AMONG COLLEGE STUDENTS

By

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ABSTRACT

BRENDALYNN LIEBERMAN. The effects of safe sex practice education on knowledge and attitudes among college students. (Under the direction of DR. KATHLEEN JORDAN)

Introduction: Sexual health education is crucial in reducing the burden of STIs among young adults. Comprehensive sexuality education can lead to positive risk reduction outcomes, such as delayed initiation of sex, a decreased number of sexual partners and frequency of sex, and increased use of contraceptives. The purpose of this study was to evaluate the effectiveness of an educational program focused on sexually transmitted infections (STIs) and safe sex practices among college students who are Greek life members. The intervention aimed to enhance the knowledge and attitudes of these students regarding sexual health and promote healthier sexual behaviors. This project is significant as it endeavors to fill the gap in existing literature concerning the effectiveness of sexual health education in college populations who are at heightened risk for STIs.

Design/Methods: The study utilized a pre-post intervention quantitative design. A convenience sample of 23 sorority and fraternity members aged 18-24 participated in the study. The intervention included an educational session focusing on aspects of sexual health, including transmission, screening, prevention of STIs, as well as safe sex practices. Participants were surveyed before and after the educational intervention using the STD Knowledge Questionnaire (STD-KQ).

Results: Of the 55 Greek life members who completed the pre-test, 23 completed the post-test. A paired-sample t-test showed that there was a statistically significant difference in STD-KQ scores pre- and post-intervention, $t(22) = 4.51$, $p < .001$, 95%CI [3.36, 9.08]. The average STD-KQ scores significantly increased from 8.65 ± 5.69 pre-intervention to 14.87 ± 5.69 post-

intervention, indicating a significant improvement in STI knowledge and attitudes among the participants after the educational program. Additionally, most respondents reported an increased likelihood of using condoms during sexual activity post-intervention. Additionally, the respondents also reported an increased awareness of STDs and safe sex practices.

Discussion:

The findings highlighted the positive impact of targeted sexual health education in a university setting, especially within the Greek life community. These results underscored the need for universities and health educators to prioritize and integrate sexual health education within the curriculum. Lastly, the study also supports adopting a structured, informative approach to improve students' awareness and practices regarding STI prevention.

DEDICATION

I am incredibly grateful for the unwavering support system that has meant so much to me throughout my academic journey. I want to express my gratitude to my husband Brian, who has always believed in me and supported me in every facet of our life together, and my two children, Eliana and Nathan, for their patience and understanding as I spent a lot of time working on my studies. Additionally, I would like to thank my parents, Patricia and Henry, my siblings, and my best friend, Korto, who have all been a constant source of encouragement. I would also like to acknowledge the DNP support group members and classmates who have become dear friends, particularly Courtney and Christine, for sharing their wisdom, guidance, and support. This work is a testament to our collective pursuit of knowledge and progress.

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LIST OF ABBREVIATIONS

APRN	:	Advanced Practice Registered Nurse
CDC	:	Centers for Disease Control and Prevention
HIV	:	Human Immunodeficiency Virus
HPV	:	Human Papillomavirus
QI	:	Quality Improvement
STD-KQ	:	Sexually Transmitted Disease Knowledge Questionnaire
STD	:	Sexually Transmitted Disease
STI	:	Sexually Transmitted Infection

CHAPTER 1: INTRODUCTION

The ubiquitous use of the best safe sex teaching practices or behavioral interventions by health care providers, especially among young individuals, is a public health priority due to the prevalence of sexually transmitted infections on health and well-being. Sexually transmitted infections (STIs), or sexually transmitted diseases (STDs), are common preventable infections affecting over 20 million Americans yearly (CDC, 2021). These infections could result in complications and comorbidity and, in most cases, long-term consequences, particularly in women, if left undiagnosed or untreated. These complications include pelvic inflammatory diseases, infertility, chronic pelvic pain, cervical cancer, pregnancy complications, congenital abnormalities in newborns, and human immunodeficiency virus (HIV) risk (CDC, 2021).

1.1 Background

According to the Centers for Disease Control and Prevention (2021), STIs affect people of all ages, particularly young individuals. In 2018, out of 26 million new cases of STIs, half were in the 15-24 age group, making it the most vulnerable population. Kriesel et al. (2018) showed the trending up of the incidence and prevalence of STIs among young adults, many of whom are college students. In the last six years, there has been an all-time high of STIs like gonorrhea, chlamydia, and syphilis, with the number of cases jumping from 2.4 million in 2020 to 2.54 million in 2021 (U.S. Department of Health and Human Services, 2023). The rise is undoubtedly a public health concern as the rates have no signs of slowing down, and neither are the complications. According to Hanson (2022), education data on college enrollment by age identified that 66.6% of college students are 24 years and younger. College students indulge in high-risk sexual behaviors, placing them at the highest risk of contracting STIs (Goldsberry & MacMillian, 2015).

1.2 Problem Statement

Hoffman and Argeros (2019) stated that“the college years are known as a time of sexual exploration among young adults, which often leads to high-risk sexual behaviors that place them at a higher risk for STDs/STI” (p. 407). These young individuals are prone to these infections for various reasons, including but not limited to lack of sexual health education, screening, multiple partners, condomless sex, and sexual activity associated with drug and alcohol use. Younger women are prone to STIs due to having a greater mucosal surface area susceptible to more pathogens during sexual intercourse. The most recent contributing factor suggested by experts is the rise of online dating, which enables people to expand their sexual network and has been connected to riskier sexual behavior (Law, 2022).

In the United States (U.S.), the expenditure on sexually transmitted infections costs billions each year. CDC (2021, p.2) estimated that“the cost of new cases of STI as of 2018 was 16 billion (U.S. dollars) in direct lifetime medical costs alone, which far exceeded the medical cost burden, and was aside from costs associated with lost productivity, other non-medical costs, and STI prevention.” Knowledge regarding STIs is crucial in young individuals and may be the remedy for STI prevention and control in this population. The emphasis on abstinence-only education programs is inadequate for STI prevention and control, and a consequence is the upsurge of STIs that have been consistent in the last six years, which is a public health concern.

1.3 Purpose of the Project

Through this project, the DNP student will determine if instruction in STIs and safe sex practices will improve knowledge and attitudes. The goal is to increase knowledge and attitudes and promote healthy sexual practices. Lederer and Sheena (2021) indicated that“sexuality education that adopts a comprehensive approach to sexual health has been found to result in

positive risk reduction outcomes, including delayed initiation of sex, a reduction in sexual partners and frequency of sex, and increased condom and contraceptive use" (p. 239).

1.4 Clinical Question

The PICO question for this project is, in a population of college students who are members of a sorority or fraternity (P), does participation in an education program focused on safe sexual practices and sexually transmitted infections (I) positively effect their knowledge and attitudes, as a means to reduce the burden of STIs (O)?

1.5 Project Aims and Objectives

This DNP scholarly project aims to determine if educational interventions focused on safe sex practice will improve knowledge and attitudes in college-aged students, particularly in Greek Life. Greek Life is a social organization in colleges and universities with active membership in sororities and fraternities. Goldsberry et al. (2016) indicated a link between Greek membership and multiple sexual partners, anal intercourse, and infidelity, and hence are at a greater risk of contracting an STI(s) during their college years than their non-Greek counterparts. The primary objective of this DNP project is to identify myths that college students hold regarding sex and sexually transmitted infections.

A second objective is to identify the barriers to engaging in safe sex behaviors using a pre-test questionnaire that would also aid in directing the content of sexual health education. The DNP student will also assess the differences between women versus men and first-year students versus seniors regarding their STI knowledge and attitudes. The project's intended outcomes are increased STI knowledge among college students and positive attitudes toward practicing safe sex (correct use of condoms, better communication with a sex partner, negotiating the use of

condoms with sex partners, regular STI screenings, and others) following the implementation of safe sex teaching intervention which will be measured via a post-test questionnaire.

CHAPTER 2: LITERATURE REVIEW

A literature search was conducted between October 2022 and March 2023 in these databases: COCHRANE, PubMed, CINAHL, Web of Science, and Google Scholar. The keywords used in the investigation were *safe sex, safe sex practices, sexual health, STDs, STIs, STD prevention, sexually transmitted infections, effective, effectiveness, efficacy, college students, university students, young adults,* and *college*. Asterisks were used with the keywords to identify if they would expand the search constraints, and the same formula was used for each database as allowable.

Inclusion and exclusion criteria were incorporated to set boundaries for the literature search to assist in identifying articles pertinent to the topic of interest (PICO question). The inclusion criteria were studies published from 2017 to 2022 initially, but this range was expanded because significant articles had been published earlier. The date was revised to studies 5-10 years old (2012-2022). Other inclusion criteria limited the results to those peer-reviewed, in English, and focused on human subjects, particularly young college adults 18 and older.

The exclusion criteria were non-English language articles, a study population under 18 years of age, and articles older than 10 years. Of the five databases, CINAHL produced more relevant studies about the topic of interest. The initial search yielded 40 studies. Incorporating the inclusion criteria, 15 studies were found suitable, and three more were added to the reference lists. A rapid critical appraisal was done by reading the abstracts, and 6 articles were excluded as they pertained to the exclusion criteria, reducing the total to 12 studies.

Of the twelve studies, there were four systematic reviews, one randomized control trial, three descriptive, one qualitative, two mixed studies, and one quality improvement project (evidence-based project) with participants mostly college students. The following themes were found: STI prevalence, college-aged adults having the highest STI risks, and the effect of safe sex practices interventions to increase STI knowledge and reduce risks of STIs in young/emerging adults, mainly in the 15-24 age group.

2.1 Research Focused on STI Prevalence

Two of the twelve studies emphasized the incidence of sexually transmitted infections and the critical gap in knowledge in this vulnerable population. Kriesel et al. (2018) demonstrated that the prevalence and incidence of STIs were significant in the 15-24 age group and were becoming a burden in the U.S. They also stated that"in a population of more than 320 million people and a prevalence estimate of 67.6 million STIs, this suggests that approximately 20% of the total U.S. population had an STI at a given point in 2018, whereas nearly half of all incident infections occurred in people aged 15 to 24 year" (p. 213). Lederer and Sheena (2021) indicated that STIs were affecting young adults at an alarming rate, leading to severe comorbidities and complications. Both studies concluded that STIs are a burden and are taking a toll on this population.

2.2 Research Focused on Target Population

STIs in the U.S. are a public health concern given the magnitude of people infected each year of all ages and backgrounds, with half of the cases in the 15-24 age group. Nebraska Medicine (2023) states that "One in two people will contract a sexually transmitted infection by age 25" (p. 1). The findings emphasized the upward trend in the incidence and prevalence of STIs among young individuals, many of whom are college students. They indulge in high-risk

sexual behaviors, placing them at the highest risk of contracting STIs (Allen et al., 2017; Hickey et al., 2013; Hoffman et al., 2016). Goldsberry et al. (2015) indicated that college years are considered high-risk sexual years for behaviors and STIs. They identified a relationship between Greek membership and an increased number of multiple sexual partners and anal intercourse.

A common risk determinant in several studies is the lack of knowledge and the dire need for sexual health education. Another interesting finding by Hickey and Cleland (2013), identified in their descriptive pilot study, was that most female college students did not consider themselves at risk for STIs, even though the use of condoms was low, particularly those with partners. The solution is to implement an STI prevention intervention for the 15-24 population, considering differences in culture, religion, and health beliefs (Wong et al., 2019).

2.3 Research on Intervention of Interest

Lederer and Sheena (2021) used a qualitative content analysis of responses to an open-ended online survey question after participants watched a web-based video on STIs. They identified a wide gap in knowledge regarding STIs, highlighting important health content like prevention, treatment/cures, prevalence/stats, STIs, and symptomatology that should be integrated into sexual health education for this population. An education centered on abstinence until marriage is ambiguous and unrealistic in this time and age. CDC (2017) indicated that “an estimated 55% of male and female teens have had sexual intercourse by age 18 with 80% using some form of contraception” (p. 1). This means that not all use latex condoms, considered the only effective method to reduce STIs when used appropriately and consistently.

Eight studies found that behavioral or educational interventions on STIs and safe sex practices effectively increased STI knowledge, showed favorable attitudes and behaviors about practicing safe sex, and reduced sexually transmitted infections (Allen et al., 2017; Goldsberry et

al., 2015; Henderson et al., 2020; Hoffman et al., 2019; Hoffman et al., 2016; Sun et al., 2017; Whiting et al., 2019; & Wong et al., 2019). The authors determined this by utilizing pre-tests to identify current knowledge of STIs, sexual health, and behaviors/attitudes, implementing the educational intervention, and then using post-tests to evaluate the intervention's effectiveness. Goldsberry et al. (2016) found that a brief STI educational intervention in fraternities and sororities increased STI knowledge.

In-person, online peer-led sexual health education and an online educational intervention on sexual health/STIs effectively increased STI knowledge and positively changed sexual behaviors (Hoffman et al., 2019; Wai et al., 2017; Wong et al., 2019). Other studies had findings that supported teaching college students about sexual health and safe sex practices or the use of behavioral interventions like the correct use of condoms. These interventions favored positive attitudes and behaviors and reduced the incidence of STIs (Henderson et al., 2020; Subbarao et al., 2017; Whiting et al., 2019). Within the literature, the apparent gap is that sexual health education is lacking among young individuals, and as a result, they are vulnerable to STIs that can easily be prevented.

Providing STIs and safe sex practice education or intervention, whether in peer groups, group discussions, videos, or use of web-based or online interventions, all increased students' knowledge and was favorable in changing sexual patterns and behaviors and reducing the incidence of STI transmission. However, there is not an adequate evaluation of inclusive behavioral or teaching interventions, nor enough diversity in the sample populations to make the studies generalizable. More studies are also needed on the long-term effectiveness of safe sex teaching practices in college students in the context of STI transmission.

2.4 Conceptual /Theoretical Framework

To understand how to promote healthy sexual behaviors and attitudes among young adults, the DNP student used the Lewin Change Theory. Lewin's Change Theory was developed by Kurt Lewin, the father of psychology (Petiprin, 2020). This theoretical framework was first proposed in 1951 to understand the principle of organizational change through a three-stage theory: Unfreeze-Change-Refreeze. Lewin described behavior in this model as "a dynamic balance of forces working in opposing directions" (Petriprin, 2020, p.1). This model has three concepts: the driving force that promotes change, the restraining force that encumbers change from occurring, and equilibrium, where both forces are equal.

Unfreezing is letting go of old patterns and preparing for change; for behavior and attitudes about safe sex practices to change for the positive, the DNP student had to identify the barriers preventing young adults from practicing safe sex for this false knowledge to be put aside (unfreezing) by making them aware of the need for change through showing the detrimental effects of the current state.

The second stage, Change, is shifting from old practices to a new level of thinking, thought processes, and behavior. In this stage, the young adults were not committed to making a change. The 'change' was implementing STI and safe sex education programs that dispelled myths and false information while improving knowledge about sexually transmitted infections, prevention, and control. In this stage, the individuals were shown the benefits of a new perspective.

Refreezing is the third and final stage after the change has been implemented. The goal is to sustain the new habit or behavior to become the new norm. In this intervention, the refreezing step was an additional pamphlet distributed after the program in the hopes that increased knowledge would impact positive, safe sex practices and reduce STI transmission.

In summary, the overall merging theme derived from the literature reviewed was a gap in knowledge related to STIs and safe sex practices prevalent among young adults aged 15 - 24 years of age. Many of the individuals in this age group are college students. The incidence and prevalence of STIs among this age group are increasing at an alarming rate. Multimodal education interventions have been found to impact knowledge and behavior positively; however, evidence specifically involving college students is lacking.

CHAPTER 3: METHODS

3.1 Project Implementation Plan

Project implementation is a strategic approach to defining an undertaking by delineating the goals, objectives, execution steps, timeline, and resources needed. Blumenthal and Stoddard (1999) indicate that the key to a project's success is a well-thought-out plan, a phase that is the most critical yet unheeded component in the implementation process. To guide this change process successfully, the DNP student carefully considered the method of choosing a sample population, the potential influence of the setting of the intervention, the design of the intervention, the data collection, measurement, and security of the data. Through this DNP scholarly project, it will be determined if instruction in safe sex practice will improve knowledge and attitudes.

3.2 Project Design

This DNP scholarly project used a quasi-experimental design utilizing a pre and post-test sexually transmitted disease knowledge questionnaire (STD-KQ) to determine if instruction about STIs and safe sex practice improved knowledge and attitudes.

3.3 Sample

This project focused on Greek life members. These are people with active membership in sororities and fraternities within the university. With approval from the Internal Review Board (IRB) and approval to access Greek Life from the Assistant Director of Fraternity and Sorority Life at UNCC, a convenience sample of its members was recruited to participate. The sample represented members of sororities and fraternities 18-24 years of age, regardless of their past or current sexual activity, all races, socioeconomic backgrounds, sexual orientations, and gender identities. This inclusion criterion was essential for the results to be generalizable, as there is not

enough data on the effects of a sexual health education intervention on college students with enough diversity in the sample population.

3.4 Setting

The DNP scholarly project's implementation setting was held at the Cone building at the University of North Carolina, Charlotte (UNCC). This setting was selected because the population of interest held meetings in this location, which was convenient for the educational intervention. The educational intervention occurred on October 15, 22, and 29, 2023, with two groups: sororities and fraternities on the UNCC campus.

3.5 Intervention and Data Collection

The DNP student was the primary investigator for this project and implemented the educational intervention. The intervention focused on sexual health education, primarily the definition of STIs, the misconceptions, social and economic impact, STI data report in Charlotte, common STIs, transmission mode, risk factors, symptoms, screening, treatment, complications, and safe sex practices for prevention and control. A comprehensive method of sexual health education has proven positive results that include using protection during sexual activity, delaying sex initiation, and practicing safe sex (Lederer & Sheena, 2021).

The DNP student conducted three educational sessions to accommodate participants' schedules. One goal for the mode of intervention was for it to be a discussion about sexual health education between peers; therefore, no PowerPoint presentation was used, and all sessions were structured as roundtable discussions. The goal was to make it a discussion about sexual health education between peers. The session lasted for 60 minutes. This quality improvement (QI) project measured STI knowledge and attitudes at baseline (pre-intervention) and post-intervention. Online pre-test and post-test questionnaires were used for measurement, and the

validity and reliability of previous studies with comparable results were checked. The DNP student ensured treatment fidelity with the "delivery of treatment," which for this project was teaching about STIs and safe sex practices.

The education, delivery method, and participation time were standardized across both groups (sororities and fraternities). The DNP student with expertise with STIs provided the education to maintain consistency across both groups and thus eliminated the need to train other providers who may have had different training, experiences, and teaching styles that could have affected the intervention. A pamphlet highlighting the educational intervention's contents, written for a high school reading comprehension level, was distributed to participants at the end of the session to reinforce the teaching, along with condoms to take home. The post-test questionnaire link was sent two weeks after the educational intervention to assess any changes in knowledge and attitudes.

3.6 Measuring Tools

The STI awareness and knowledge of the participants were assessed using the STD Knowledge Questionnaire (STD-KQ) developed by Jaworski and Carey in 2007, used to identify knowledge deficits and determine risk reduction programs in participants. The authors permitted the DNP student to use this tool (see Appendix A). The measuring tool was a 27-item questionnaire that used three-option responses "true," "false," and "don't know" choices to measure common STI knowledge about human immunodeficiency virus (HIV), human papillomavirus (HPV), genital herpes, hepatitis B, gonorrhea, chlamydia, and genital warts.

The scoring ranged from 0 to 27, with correct responses measuring a score of 1 and wrong and don't know" responses calculating a score of 0 each. Jaworski and Carey (2007) indicated that "the STD-KQ demonstrated internal consistency (alpha = .86) and test-retest

reliability (r = .88) over a brief period.” This measuring tool has been used numerous times in studies discovered in the literature measuring STI knowledge and awareness, which shows its validity and reliability.

3.7 Data Collection Procedure

For this DNP scholarly project, the DNP student collected data using the survey with Qualtrics, which collected data for the inclusion criteria with participants between 18-24 years and a member of Greek Life at UNC Charlotte. The participants who satisfied the inclusion criteria were prompted to go to the informed consent page detailing the project’s structure, highlighting that information will be anonymous and voluntary. Participants who agreed to the informed consent had to create a 6-alphabetical/numerical identifier to access the questionnaires and assist the DNP student in matching the pre-test and post-tests.

Then, a tool was used to collect social, demographic, and sexual behavior data. The social and demographic data obtained the following data: age, gender identity, sexual orientation, year in college, ethnicity, sexual status, and sexual behavior data; the number of partners in the last 12 months; previous STIs, use of protection during sexual intercourse, and type of sex participate on. Pre- and post-tests will then assess STI knowledge and attitudes using the STD-KQ questionnaire of participants before and after the educational intervention.

Timeline for Data Collection

The DNP student created a flyer for the recruitment process with details about the project and contact information for those who were interested. The DNP student emailed Greek life members interested in the project. Data collection began in the fall of 2023, a month before the educational intervention. A link was emailed to potential participants to start the registration process.

Participants who fit the criterion were prompted to go to the informed consent page to create a 6-alphabetical/numerical identifier, then proceeded to the demographic survey and pre-test questionnaire (STD-KQ). The DNP student created the educational intervention, which was provided to two groups, sorority and fraternity, that lasted for 60 minutes and concluded with instructions about completing a post-test questionnaire in two weeks.

A flyer was sent out after the intervention, providing information about the timeline for the post-test with instructions and thanking the participants for attending the intervention. This reminder was sent seven days before, and on the day the post-test questionnaire went live. A link was attached to the email on the go-live day for participants to complete the post-test questionnaire.

3.8 Data Analysis

All data collected for this scholarly project was stored in an Excel sheet. Through this quality improvement (Q.I.) project, the DNP student aimed to determine the effect of an STI and safer sex education intervention on Greek life members by comparing the difference in "pre and post-tests" (two scores) of participants, using a paired-samples t-test with $p < .05$ to show statistical significance.

3.9 Ethical Consideration

Confidentiality of data is essential to protect participants against any harm resulting from this project. Before implementing this DNP project, approval was obtained from the Internal Review Board (IRB) of UNCC after an application was completed and some modifications were made (see Appendix C). The DNP student maintained the confidentiality of the scholarly project by having participants create unique identifiers (6-alphabetical/numerical code) by asking two questions before starting the questionnaire, which were the first two letters of their home address

and the last four digits of the phone number. The same questions were asked at the post-test to link the pre-and post-test questionnaires and avoid participants having to memorize them.

No identifying information was collected for this project except email addresses to send the survey links. Participants' names and emails were stored in encrypted computer-based files. All the data was collected online via the Qualtrics survey platform; hence, paper-based records were unnecessary. The data was then transferred to EXCEL format and made available only to people involved in the project with secure access.

Conclusion

There is a gap in knowledge regarding STIs and safe sex practices in the 15-24 age group. In the U.S., traditional undergraduates in college are typically between ages 18-24, and studies have shown them to be more likely to engage in high-risk sexual behaviors, significantly increasing their risks for STIs. Research findings display a list of contributing factors, including the lack of sexual health education. Studies indicate that an intervention increases knowledge and, in turn, affects sexual behaviors and practices. However, most studies have focused on the immediate effect of teaching, and participants of the studies are primarily heterosexuals. Further research is needed to explore the influence of safe sex teaching interventions in all sexual orientations and diverse populations and the long-term impacts of safe sex practice teaching on attitudes and high-risk sexual behaviors.

CHAPTER 4: PROJECT RESULTS

The purpose of this DNP scholarly project was to determine if educational interventions focused on safe sex practice will improve knowledge and attitudes toward sexually transmitted infection (STI) among college-aged students, particularly in Greek Life. This chapter presents the results of the project. It begins with descriptive statistical information about the sample's demographic. Then, it is followed by the results of inferential statistics on the data collected.

4.1 Sample Demographic Information

Fifty-five college students who are Greek Life members consented and completed the pre-test survey. However, of these students, only 23 completed the post-test survey. The demographic information of the 23 respondents is presented in Table 1. The survey collected various aspects of their demographic characteristics, including college year, gender identity, sexual orientation, fraternity/sorority membership, sexual activity, number of partners, sexual preference, and condom use.

Table I

Demographic Information of the Greek Life Members

Variable		n	%
Which category includes your age?	18 - 20	12	52.17
	21 - 24	11	47.83
What is your ethnic background?	Black/African American	1	4.35
	Hispanic	1	4.35
	White/Caucasian	21	91.30
What year are you in college?	Freshmen/1st year	3	13.04
	Sophomore	12	52.17
	Junior	6	26.09
	Senior	2	8.70
Gender: How do you identify?	Female	1	4.35
	Male	22	95.65
Which of the following best represents how you think of yourself?	Asexual	1	4.35
	Heterosexual or straight	22	95.65

Table I continued

Demographics Information of the Greek Life Members

Variable		n	%
Demographic Information of the Greek Life Members To which do you belong?	Sorority	3	13.04
	Fraternity	20	86.96
Are you sexually active?	No	2	8.70
	Yes	16	69.57
	Have been sexually active but not currently	5	21.74
How many partners have you had in the last 12 months?	1 partner	4	17.39
	2-4 partners	15	65.22
	5-9 partners	4	17.39
Who do you have sexual intercourse with?	Women	22	95.65
	Men	1	4.35
Do you use protection like condoms during sexual activity?	Never	5	21.74
	Sometimes	13	56.52
	Always	5	21.74

More than half of the survey respondents, 52.17% (*n* = 12), fell into the 18–20-year age group, while the remaining 47.83% (*n* = 11) were in the 21-24 age group. When asked about their ethnic background, 91.30% (*n* = 21) of students identified as White/Caucasian. The remaining students identified as Black/African American (4.35%, *n* = 1) and Hispanic (4.35%, *n* = 1). In terms of college years, there were 13.04% (*n* = 3) freshmen or 1st-year students, 52.17% (*n* = 12) sophomores, 26.09% (*n* = 6) juniors, and 8.70% (*n* = 2) seniors. The survey included a question on gender identity. Most respondents, 95.65% (*n* = 22), identified as male, while only 4.35% (*n* = 1) identified as Female. In terms of sexual orientation, 95.65% (*n* = 22) of the respondents identified as heterosexual or straight, while 4.35% (*n* = 1) identified as asexual. When asked about fraternity or sorority membership, a majority of respondents, 86.96% (*n* = 20), belonged to a fraternity, whereas 13.04% (*n* = 3) were members of a sorority.

The respondents were also asked about their sexual activity. Of the respondents, 69.57% (*n* = 16) reported being sexually active, 21.74% (*n* = 5) were previously sexually active but not currently, and 8.70% (*n* = 2) were not sexually active. When asked about the number of partners in the last 12 months, 65.22% (*n* = 15) respondents reported having 2-4 partners, 17.39% (*n* = 4) reported having 1 partner, and another 17.39% (*n* = 4) reported having 5-9 partners. In terms of sexual intercourse preference, a vast majority of the participants, 95.65% (*n* = 22), preferred women, while 4.35% (*n* = 1) preferred men. Lastly, the respondents were also asked regarding condom use during sexual activity. According to the response, condom usage varied, with 56.52% (*n* = 13) reporting that they sometimes used condoms, 21.74% (*n* = 5) always used them, and another 21.74% (*n* = 5) never used them.

4.2 Sexually Transmitted Disease Knowledge Questionnaire (STD-KQ) Results

The project was guided by the following PICO question: "In a population of college students who are members of a sorority and fraternity (P), does participation in an education program focused on safe sexual practices and sexually transmitted infections (I) positively effect their knowledge and attitudes, as a means to reduce the burden of STIs (O)?" To answer this question, students' knowledge and attitudes toward STIs were measured using the STD Knowledge Questionnaire (STD-KQ) before and after the educational program.

Prior to conducting the inferential statistics, the data were checked for the assumptions of normality of distribution and no outliers. Histograms of pre- and post-intervention data showed that the data were normally distributed (Figure 1). The Shapiro-Wilk test confirmed that the data for both groups were normally distributed, $p > .05$. Visual inspection of boxplots showed no outlier (Figure 2).

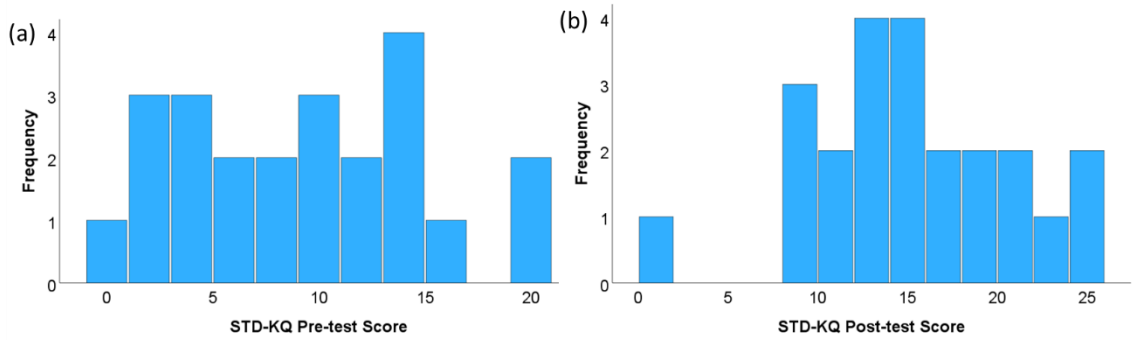

Figure 1
Histograms of Pre-Intervention and Post-Intervention STD-KQ Scores

Note. (a) Histogram of STD-KQ scores pre-intervention; (b) Histogram of STD-KQ scores post-intervention.

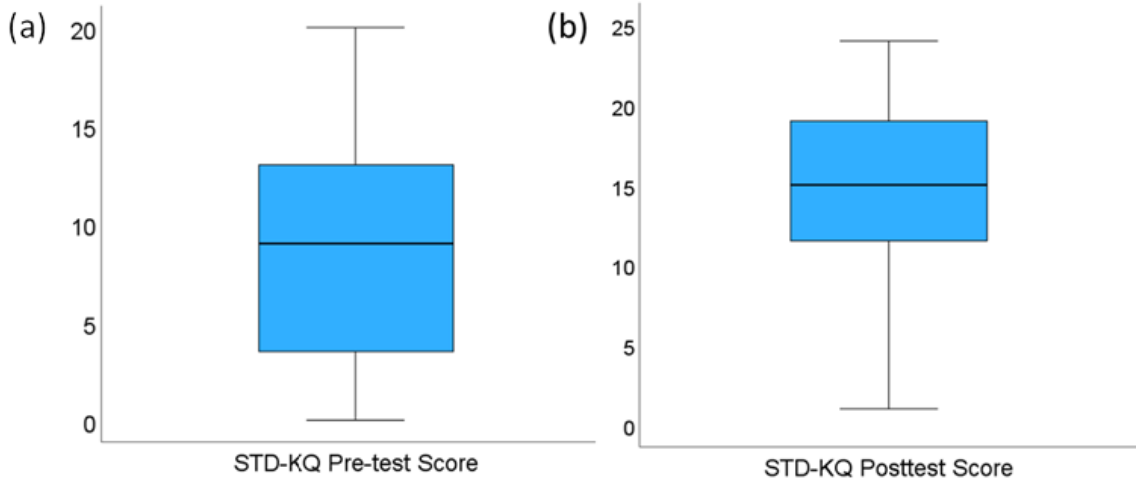

Figure 2
Boxplots of Pre-Intervention and Post-Intervention STD-KQ Scores

Note. (a) Boxplot of STD-KQ scores pre-intervention; (b) Boxplot of STD-KQ scores post-intervention.

The average STD-KQ scores before and after the intervention were 8.65 ± 5.69 and 14.87 ± 5.69. These scores are reported as mean ± standard deviation. A paired-samples t-test was run to compare the STD-KQ scores before and after the intervention, and it found that the post-intervention scores were statistically significantly higher than the pre-intervention scores, t (22) = 4.51, $p < .001$, 95%CI [3.36, 9.08]. Cohen's d was .94, indicating a large effect size. These

findings showed that the educational intervention substantially impacted and improved students' knowledge and attitudes toward STIs.

4.3 Additional Data

The respondents were also asked about two things – their perceived overall change in attitude in how likely they are to use protection during sexual activity (change) and overall awareness of STDs and safe sex practices (awareness). Change was scored from 1 (no change) to 3 (more likely). In terms of change, most of the respondents (78.26%, *n* = 18) indicated that they were more likely to change in their attitude to use protection during sexual activity. In terms of awareness, most of them (86.96%, *n* = 20) reported that they became more aware of STIs and safe sex practices. Table 2 presents a summary of the feedback received regarding the topics of Change and Awareness.

Table 2

Perceived Overall Change in Attitude and Awareness of STDs and Safe Sex Practices

		n	%
Please rate your overall change in attitude in how likely you are to use protection during sexual activity.	No Change	2	8.70
	Less Likely	3	13.04
	More Likely	18	78.26
Rate your overall awareness of STDs and safe sex practices.	Less Aware	2	8.70
	Neutral	1	4.35
	More Aware	20	86.96

In comparison to all the studies that were critically appraised, this quality improvement also shows that that educating young individuals about sexual health and safe sex practices is successful in increasing knowledge and improving or changing sexual behaviors.

Chapter 5: SIGNIFICANCE AND IMPLICATIONS

5.1 Discussion of Results

This Doctor of Nursing Practice (DNP) project was guided by the following clinical question, “In a population of college students who are members of a sorority or fraternity, does participation in an education program focused on safe sexual practices and sexually transmitted infections positively affect their knowledge and attitudes, as a means to reduce the burden of STIs?” This study used a quasi-experimental design involving Greek Life students at the UNCC. The intervention was educational and designed to enhance the participants’ sexual health literacy. The participant’s knowledge and attitudes were assessed before and after the educational intervention using the STD Knowledge Questionnaire (STD-KQ). The findings from this scholarly project provide insights into the benefits of educational interventions in enhancing attitudes toward STIs and safe sex practice, particularly among college Greek Life members.

The project results found a wide gap in knowledge regarding STIs among the participants before the educational intervention. The mean pre-intervention scores were 8.65, suggesting the participants were not well-informed about the transmission, prevention, and treatment of STIs, making them prone to high-risk sexual behaviors. The finding supports the notion by Hoffman and Argeros (2019) that young adults in their college years are at a higher risk for STDs/STIs. These results also highlight the need for educational interventions to improve the participant’s knowledge and understanding regarding the issues.

The statistical analysis comparing pre- and post-intervention showed a statistically significant increase in the average STD-KQ scores, from 8.65 to 14.87 post-intervention. This change demonstrates the effectiveness of the educational intervention in increasing the knowledge and attitudes among the target population. This improvement also suggests that the

project participants received the educational content well. This finding is congruent with previous literature that highlights the effectiveness of brief STI educational interventions in fraternities and sororities in increasing STD/STI knowledge (Goldsberry et al., 2016).

Additionally, most participants also reported an increase in their likelihood of using protection during sexual activity and that they became more aware of STIs and safe sex practices. The findings reflect a positive attitude shift and reinforce the importance of providing comprehensive sexual health education. This change is noteworthy since it shows how a simple educational intervention could improve knowledge and attitudes toward STDs/STIs, particularly among the college population who had been reported to have high-risk sexual behaviors (Allen et al., 2017; Hickey et al., 2013; Hoffman et al., 2016).

The findings support Lewin's Change Theory (Petiprin, 2020), demonstrating how a simple and well-designed educational intervention can change behavior in a targeted population. In the case of this scholarly project, the participants' knowledge level can be seen in the "frozen" stage before the intervention. After receiving the educational intervention that provided comprehensive information about STDs/STIs, the participants learned about the misconceptions and started to change their beliefs. This condition serves as the "unfreezing" phase and facilitates "change." The improvement in STD-KQ scores from 8.65 (pre-intervention) to 14.87 (post-intervention) and the change in attitudes show that the "refreezing" phase was happening among the participants. This phase solidified their newly acquired knowledge and attitudes into new cognitive frameworks. This theoretical underpinning enhances the project's contribution to existing knowledge by illustrating how change theories can be operationalized in public health interventions to maximize impact.

5.2 Limitations

This QI project had some limitations that need to be addressed. The first limitation was the short time to complete the project. The process of solidifying and internalizing newly acquired knowledge requires time, and the provided time might not be sufficient to see the most optimal results of the training. The DNP student suggests a 6-week post-intervention follow-up to study the more prolonged impact of the intervention on the participants' sexual behavior.

The second limitation was its small number of participants. During the recruitment process, there was little to no support or cooperation from Greek life members. The DNP student utilized a rigorous recruitment process, from attending chapter and leadership meetings, giving several presentations, and making phone calls. However, out of 39 chapters, only two fraternities and a few members from a sorority agreed to participate in the project. Most participants, 86.9%, belonged to a fraternity (n = 20), and in comparison, 13.04% (n =3) were sorority members. It seemed that sorority chapters were not willing to participate in sexual health discussions. There could be several reasons for this.

One possibility is that women are more likely to have regular check-ups and already have information about sexual health. Another possibility is that social norms and expectations may make them hesitant to engage in such discussions openly. Privacy concerns may also play a role, as women may consider sexual health discussions to be a private matter and feel uncomfortable discussing it openly. Fear of being judged may also contribute to their reluctance. Lastly, it could be that their developmental stage of life, ages 18-24 years old, also known as late adolescence/early adulthood, influences their self-perception, causing them to feel that they are sexually experienced and hence "invincible" and so would not get an STI. This small number of

participants could affect the generalization of the results. For this reason, results from this study need to be inferred cautiously.

IRB did not permit the DNP student to use incentives due to the risk of participants' confidentiality concerns. Lastly, the study sample was not as diverse as expected, as 91.3% of the subjects were White/Caucasian. Furthermore, only students from one university were involved. Such a condition may limit the generalizability of the results. Future studies, including more diverse subjects and universities, could provide results that are more representative of young adults in college.

5.3 Recommendations for Nursing Practice

Sexually transmitted infections (STIs) are a significant public health challenge that impacts people of all ages, particularly among the 15-24 age group, which includes a large portion of college students. The lack of knowledge about STIs is a major contributing factor, and there is evidence that educational interventions - whether conducted by peers, in-person, or online - can increase awareness and promote positive attitudes toward safe sex practices. This DNP project confirms the effectiveness of such interventions, highlighting the critical role that advanced practice registered nurses (APRNs) can play in providing educational services in both clinical and academic settings. This Quality Improvement (QI) project proves that educating young adults about sexually transmitted infections (STIs) and safe sexual practices is a cost-effective measure. Such interventions can be easily disseminated in clinics, healthcare settings, institutions of higher learning, and possibly in high schools. The benefits of these efforts outweigh the low costs, making it a worthwhile investment.

According to Keller (2020), young individuals deserve to receive precise and comprehensive sex education to prevent STIs and lessen their negative impact. APRNs have a

significant role to play in making this happen as they can advocate and lobby for sex education programs that provide students at high school and collegial levels with accurate details of STIs, prevention, transmission, identification of symptoms, treatment of STIs, and testing. Additionally, such programs should prepare students with the skills to develop healthy relationships and express their sexual independence in a healthy manner, such as by understanding consent and promoting the use of condoms. The abstinence-only programs have not proven to be effective given the early onset of initiation of sex and the trending up of STI cases amongst the 15-24 age group. An article by McCammon (2017) "confirms previous public health findings that abstinence-only education programs don't succeed in reducing rates of teen pregnancies or STDs. Moreover, public health data indicate that such programs "have little demonstrated efficacy in helping adolescents to delay intercourse" (p. 1).

Advanced Practice Registered Nurses (APRNs) hold a crucial role in addressing the lack of adequate sexual health education for young adults. By providing the necessary guidance, APRNs can empower young adults to cultivate healthy and safe relationships and minimize their exposure to sexually transmitted infections, an issue of utmost public health concern. Results from this project and previous studies have documented the success of educational interventions in promoting safe sex and enhancing STI awareness. Yet, the challenge remains to ensure the durability of these behavioral changes.

Exploring strategies to maintain these improvements is necessary to ensure a long-lasting impact. For example, continuing education via online resources that are accessible through college websites or integrating sexual health education into the curriculum each semester could serve as valuable tools in promoting sexual health awareness. Integrating sexual education and

emphasizing safe sex practices on the social media platforms of colleges can have a positive impact on students' sexual health and well-being.

5.4 Future Projects or Research

Future Projects or research can aim to address several key areas to build upon the findings from this project. Firstly, studies that evaluate the intervention's long-term effects and determine if attitudes return to pre-intervention levels or if knowledge decreases six weeks to six months or one-year post-intervention are needed. While the results from the present project showed improvements in knowledge and attitudes, understanding whether these changes persist or change over time can provide more clarity on developing more sustainable educational interventions. Longer-term projects or studies can provide insights into the components and frequency of reinforcement required to ensure lasting safe sex practices among young adults, particularly college students.

Secondly, future projects or research should consider expanding the scope of research subjects involving participants from a broader range of universities and backgrounds that are more representative of young adults. Involving participants from these wider backgrounds could provide a more comprehensive understating of sexual health knowledge and attitudes across diverse student populations. Furthermore, this approach would make the study results more generalizable to the population.

5.5 Summary

Sexually transmitted infections remain a significant public health concern to communities, states, and the nation as a whole, and their cases continue to increase despite the COVID pandemic having many isolated in their homes for long periods. These infections pose a severe threat, particularly to women who may face severe complications like cancer and

infertility when infections are left untreated. The age group of 15-24 remains at highest risk of contracting STIs. Previous literature has shown that multimodal educational intervention is effective at increasing knowledge about STIs and improving sexual behaviors amongst this population and could impact the rate of STI cases.

This study found that a single 60-minute educational session was effective in increasing knowledge about sexually transmitted infections (STIs) and improving attitudes towards safe sex practices among college students. However, it is essential to continue educating college students about sexual health and safe sex practices, starting as early as high school. Universities and colleges should take a more active role in preventing and controlling STIs, as it is a severe public health concern. College students need to be aware of the risks and learn ways to protect themselves from STIs.

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APPENDIX A: MEASUREMENT TOOL

Sexually Transmitted Disease Knowledge Questionnaire (STD-KQ)

AK14. STI KNOWLEDGE SCALE

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

Source:
Jaworski, B., Carey, M. (2007) **Development and Psychometric Evaluation of a Self-administered Questionnaire to Measure Knowledge of Sexually Transmitted Diseases**, AIDS Behav (2007) 11:557–574

APPENDIX B: PERMISSION TO USE STD-KQ QUESTIONNAIRE

Michael Carey <michael_carey@brown.edu> Mar 29, 2023, 4:52AM (10 days ago)

to me

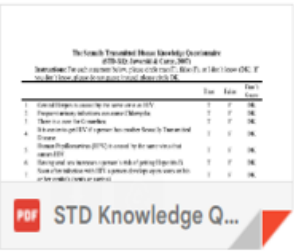
Dear Brendalynn,

You have my permission to use the STD KQ. Please see attached. Good luck with your research.

Sincerely,
Michael Carey
Emeritus Professor, Brown Univ

<Instrument Permission Letter.docx>

One attachment • Scanned by Gmail



STD Knowledge Q...

APPENDIX C: ATTITUDE SCALE

Attitude Scale

Q1 *

Please rate your overall change in attitude in how likely you are to use protection during sexual activity.

- ○ No change
- ○ Less likely
- ○ More likely

Q2 *

Rate your overall awareness of STDs and safe sex practices.

- ○ Neutral
- ○ Less aware
- ○ More aware

APPENDIX D: IRB APPROVAL

CHARLOTTE
DIVISION OF RESEARCH

To:	Brendalynn Lieberman School of Nursing
From:	Office of Research Protections and Integrity
Approval Date:	17-Jul-2023
RE:	Notice of Determination of Exemption
Exemption Category:	3
Study #:	IRB-23-0933
Study Title:	The Effects of Safe Sex Practice Education on Knowledge and Attitudes Among College Students.

This submission has been reviewed by the Office of Research Protections and Integrity (ORPI) and was determined to meet the Exempt category cited above under 45 CFR 46.104(d). This determination has no expiration or end date and is not subject to an annual continuing review. However, you are required to obtain approval for all changes to any aspect of this study before they can be implemented and to comply with the Investigator Responsibilities detailed below.

Your approved consent forms (if applicable) and other documents are available online at Submission Page.

Investigator's Responsibilities:

1. Amendments **must** be submitted for review and the amendment approved before implementing the amendment. This includes changes to study procedures, study materials, personnel, etc.
2. Researchers must adhere to all site-specific requirements mandated by the study site (e.g., face mask, access requirements and/or restrictions, etc.).
3. Data security procedures must follow procedures as described in the protocol and in accordance with OneIT Guidelines for Data Handling.
4. Promptly notify the IRB office (uncc-irb@charlotte.edu) of any adverse events or unanticipated risks to participants or others.
5. Five years (5) following this approval/determination, you must complete the Admin-Check In form via Niner Research to provide a study status update.
6. Be aware that this study is included in the Office of Research Protections and Integrity (ORPI) Post-Approval Monitoring program and may be selected for post-review monitoring at some point in the future.
7. Reply to the ORPI post-review monitoring and administrative check-ins that will be conducted periodically to update ORPI as to the status of the study.

8. Complete the Closure eform via Niner Research once the study is complete.

Please be aware that approval may still be required from other relevant authorities or "gatekeepers" (e.g., school principals, facility directors, custodians of records).

APPENDIX E: RECRUITMENT FLYER

APPENDIX F: POST-TEST FLYER

POST-TEST QUESTIONAIRE

Thank you for completing the pretest questionnaire and participating in the educational intervention. In 2 weeks, a link will be emailed to you to complete the post-test questionnaire. You must enter the same four digit code used in the pretest.

THANK YOU

We appreciate you taking time to partiicpate in this project.

WHEN?

2 WEEKS

X/X/23

Those who complete the study will be entered for a chance to win one of twenty $15 gift cards chosen randomly.

For more information, email @blieberı@uncec.edu

APPENDIX G: PAMPHLET

How STIs Are Transmitted?

Sexually Transmitted Infections (STIs) are transmitted through:

- Oral, Vaginal or Anal sexual intercourse
- Pregnancy and Childbirth
- Infected blood or blood products
- Shared needles, syringes or drug equipment.

DID YOU KNOW?

Of 20 million cases of STIs yearly in the U.S., half were in people between 15-24 years old.

Common STIs

STIs are caused by bacteria, viruses or parasites. There are numerous kinds with most common including:

- Chlamydia: Bacteria
- Gonorrhea: Bacteria
- Tichomonas: protozoa
- Syphilis: Bacteria
- HPV: Virus
- Herpes: Virus
- Hepatitis: Virus
- HIV: Virus

DID YOU KNOW?

STIs like chlamydia, gonorrhea, and syphilis increase the chance of getting HIV and transmitting it to others.

Symptoms

STIs symptoms vary by type. Common symptoms include:

- bumps, sores or warts on penis, vagina or anus
- abnormal vaginal discharge with bad odor, vaginal irritation
- Penile discharge
- Irregular vaginal bleeding
- Painful sex
- Painful urinating
- Frequent urination
- Vaginal, anal or penile itching

DID YOU KNOW?

Many STIs have no symptoms and can pass infection to partners without knowing it.

Testing

When?

- After having unprotected sex or sharing injection drug equipment
- Ages 13-64 test yearly for HIV
- All sexually active younger than 25-year tested yearly for Gonorrhea & Chlamydia
- Age 25 and older test yearly or more frequently if you have multiple partners
- If you have symptoms
- All sexually active gay, bisexual and men that have sex with men test yearly for Syphilis, Gonorrhea, & Chlamydia yearly or more frequently with multiple partners (every 3-6 months)
- Have oral or anal sex

How to Prevent STIs

Use Condoms

Condoms lessen risks of most STIs if used correctly with every act of sex.

Have fewer partners

Having a mutually monogamous partner who agree to only have sex with you and getting tested at the same time can reduce your risk.

Talk with sex partners

How to Prevent STIs

Get Tested

The only to know you have an STI is to get tested.

Get Vaccinated

HPV which can cause genital warts and some cancers can be prevented by getting vaccinated with HPV vaccine. HPV vaccine is a safe and effective in reducing the risks of HPV.