

Improving Chlamydia and Gonorrhea Testing Utilization on a College Campus

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Abstract

Background: Chlamydia and gonorrhea infections disproportionately affect individuals between the ages of 15 and 24 in the United States. This age group significantly underutilizes recommended screening guidelines to assess for these infections due to many factors including lack of awareness and other barriers (CDC, 2021).

Purpose: Addressing the problem of underutilization of recommended screening for chlamydia and gonorrhea in the undergraduate student population at a small, private university was the primary focus of the project.

Method: A self-initiated and self-collected process of urine specimens for chlamydia and gonorrhea testing through Health Services on the university campus was implemented. Raising awareness of the importance of testing through collaboration with the University's peer educator group was a principal strategy.

Results: Results showed that this process was well accepted by participants and had a positive effect on testing utilization. Percentage of sexually active participants tested during the study period was 9.87%, while percentage during a similar time period in the previous three years was 1.89%, 2.27%, and 8.86% respectively. Survey responses by all participants indicated willingness to use the process again.

Conclusions: Adopting the process of self-initiated and self-collected urine specimens for chlamydia and gonorrhea testing helps improve utilization. Use of peers to influence positive sexual health practices in this population offers great potential.

Keywords: undergraduate college students, sexual activity, sexually transmitted infections (STIs), awareness, barriers, self-initiated and self-collected specimens

Dedication

This paper is dedicated to my daughters, Gabrielle, and Jessica. You inspire me to make the world a better place. Jessica, although you are not with me physically, you have been with me every step along the way as I have done this work. Jessica, I hold you in my heart.

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Chapter 1: Improving Chlamydia and Gonorrhea Testing Utilization on a College Campus

For many young adults, attending college is a much anticipated and major life event. While moving to campus may be seen as a rite of passage, it is often the first time that young adults are living on their own, without parental supervision, and required to make potentially life-altering decisions independently. In a study on adolescent risk-taking, Steinburg (2008) identifies that “some of the greatest threats to the well-being of young adults in industrialized societies come from preventable and often self-inflicted causes, including sexual risk-taking” (p.78). The intersection of neurobiology and developmental stage place young adults at unique risk for preventable sexually transmitted infections due to risky behavior (Steinburg, 2008). The American College Health Association (ACHA) identifies that young adults on a college campus are at a crucial developmental stage, not only learning more about themselves and their bodies, but also trying to develop healthy, meaningful, intimate relationships. It is this unique developmental stage that poses specific risks and requires a range of tailored approaches, including raising awareness, reducing barriers, and developmentally appropriate messaging, to meet sexual health needs and prevent harm. In addition, diversity of gender and sexual identification add to the importance of considering sexual health needs broadly and inclusively (ACHA, 2020).

Sexual health intersects with many dimensions of health and wellness. Studies tell us that the current status of sexual health services and resources may not provide the knowledge and tools undergraduate college students need to maintain their health and obtain recommended screening for sexually transmitted infections (Eastman-Mueller et al., 2022). Colleges must work to develop and implement effective education and intervention strategies to address these needs.

Utilizing Pender’s Health Promotion Theory and the ACE Star Model of Knowledge

Transformation, a project to raise awareness, implement, and evaluate an evidence-based method of self-initiated and collected specimens was developed and initiated. In an effort to provide developmentally appropriate messaging, student peer educators were used as a primary way to raise awareness. The ultimate goal of the project was to increase chlamydia and gonorrhea testing utilization in undergraduate university students, thus improving sexual health in this population.

Background

Students attending college come from a wide range of exposure to sexual health education – from none to abstinence-based education to more comprehensive education. The ACHA (2020) recommends that sexual health education be part of comprehensive health education. Such information should include sexually transmitted infections, prevention of infections, recommended testing, and treatment, and be presented in a way that is inclusive and developmentally appropriate. Information and services must be inclusive to meet the diverse needs of students who identify as lesbian, gay, bisexual, transgender, or queer (LGBTQ). Colleges must work to provide sufficient awareness of how to maintain sexual health.

The Centers for Disease Control and Prevention (CDC) conducts an important national, representative survey of adolescents and young adults every two years to collection information about risk-taking behavior in this population. The survey monitors health behaviors that contribute significantly to the leading causes of death, disability, and social problems, including tobacco use, dietary behaviors, physical activity, alcohol and drug use, behaviors that may cause unintentional injury or violence, and sexual behaviors (Healthy People 2030, n.d.). Data from the 2019 National Youth Risk Behavior Surveillance Survey shows that for the ages of 15 to 24, about 40% of those who identify as heterosexual and 44.9% of those who identify as a sexual

minority (SM) (the CDC defines SM as lesbian, gay, or bisexual), are sexually active (CDC, 2019). These statistics have changed little since 2015. The survey found that 9% of heterosexuals and 11% of SMs in this age group have had four or more partners in the past year. While 46% of those who were sexually active in the past three months did not use a condom, less than 10% of all people in this age group had testing for chlamydia and gonorrhea (CDC, 2019). The ACHA conducts the National College Health Assessment Survey, collecting data on the health of college students from over a hundred institutions across the United States. Data specific to undergraduate college students published by the ACHA shows findings consistent with the CDC data, but also identifies that approximately three-quarters of undergraduate college students are sexually active by the time they reach their fourth year of college (ACHA, 2022). Together, these survey findings highlight the risk for STIs in this population and the need for change. Although data is not available for the number of students who are sexually active at the University of focus for this project, there is no reason to believe that the behavior of students is significantly different from national findings.

While many organisms can cause sexually transmitted infection, the CDC (2021) identifies that infections caused by chlamydia and gonorrhea disproportionately affect undergraduate college-age individuals, so the project focused only on chlamydia and gonorrhea. The terms sexually transmitted infection and sexually transmitted disease are often used interchangeably. In this paper, the term sexually transmitted infection (STI) will be used. Sexual activity is defined to include oral-to-genital sex, genital-to-genital sex, and anal sex. Meeting sexual health needs naturally takes into consideration ways to implement recommended screening guidelines for this population.

Recommended Screening Guidelines

The CDC and the US Preventative Services Task Force (USPSTF) provides the most recent guidelines for screening in this population. Recommendations for screening guidelines are based on risk stratification determined by biological sex. Because chlamydia and gonorrhea are most often asymptomatic and because of the associated risk for pelvic inflammatory disease, ectopic pregnancy, chronic pelvic pain, infertility, and increased susceptibility to human immunodeficiency virus infection, the CDC (2021) and the USPSTF (2021) recommends that all sexually active females, as well as men who have sex with men (MSM), younger than 25 years of age be tested annually for chlamydia and gonorrhea. These recommendations are based on the finding of moderate net benefit in these populations. The use of nucleic acid amplification tests on urine specimens provides both sensitive and specific results for the presence of chlamydia and gonorrhea (CDC, 2021; USPSTF, 2021). Although in the past, specimen collection for testing required an exam and a vaginal or urethral swab by a practitioner, testing can now be done on urine specimens. MSM have a 42% greater risk for contracting gonorrhea than heterosexual men (CDC, 2021). Finding insufficient evidence, the CDC (2021) and USPSTF (2021) do not identify similar annual screening recommendation for sexually active males younger than age 25 (outside of MSM). However, this population is still important to consider as infected men may act as a source of new infections and reinfections in their partners. Implementation of recommended screening is necessary to address the significant problem and meet sexual health needs in young adults.

Significance of the Problem

The CDC (2021) estimates that young adults, ages 15-24, made up almost half of the 26 million new sexually transmitted infections in the United States, with the total cost of infections

at 16 billion dollars annually. While almost half of this age group has engaged in vaginal or oral sex, and 10% in anal intercourse, less than 10% of people in this age group use STI testing each year (CDC, 2021). To assess the significance of the problem and validate the need for the proposed project in the implementation setting, the data on STI test utilization was obtained through the University Health Services electronic records and the number of total undergraduate students identified. As noted previously, because the number of students who are sexually active at the University is unknown, the national statistic of 40% was applied (CDC, 2021). From 2019-2020 there were 811 undergraduate students and 15 tests for chlamydia and gonorrhea, from 2020-2021 there were 770 students and 15 tests, and from 2021-2022 there were 791 students and 33 tests. Applying the statistics from the CDC of 40% being sexually active to the undergraduate student population for these time periods, the following percentage of test use per population was: for 2019-2020, 3.7%; 2020-2021, 4%; and 2021-2022, 8.5% (See Table 1). The number of sexually active students tested is below the national data of 10% and far from the goal of 100%. These numbers highlight the significant underutilization of tests at the University.

Table 1

Chlamydia and Gonorrhea Test Usage, Academic Years August 2019-May 2022

Academic Year	Total Number of Students	Estimated Number of Sexually Active Students	Number of Tests Performed	Percent of Sexually Active Students Tested
2019-2020	811	324	15	3.7%
2020-2021	770	308	15	4.0%
2021-2022	791	316	33	8.5%

Note. Peer educator program implemented academic year 2021-2022.

Lack of adherence to STI testing guidelines is due to multiple factors. Lack of knowledge and awareness, the resulting underestimation of risk, perception of stigma, embarrassment, cost, privacy, and accessibility are some of these factors. These findings highlight the need for colleges to develop ways to connect students to sexual health care and recommended STI testing (Eastman-Mueller et al., 2022).

The Problem and Purpose of the Project

The prevalence of STIs and under-utilization of testing in undergraduate college-age students clearly identified a need for change. The problem examined in this project was a lack of awareness and utilization of recommended testing for chlamydia and gonorrhea in this age group. The purpose of this project was to raise awareness of the issue and increase the use of recommended screening by undergraduate students. The project aimed to achieve these goals through implementation of the evidence-based strategy of self-initiated and self-collected urine specimens.

Clinical Question and Phenomenon of Interest

Due to the frequency of infection and underutilization of recommended testing for chlamydia and gonorrhea in college-age individuals, this project sought to answer the clinical question of whether implementation of a process of self-initiated and self-collected urine testing for chlamydia and gonorrhea would increase utilization. This phenomenon of interest was lack of awareness and failure to use recommended chlamydia and gonorrhea testing. This phenomenon was explored through a literature review and summary. Organizational needs and congruence were utilized to facilitate and guide the work of answering the clinical question.

Organizational Congruence

The project setting is a small, faith-based university in Virginia. Undergraduate

enrollment has ranged between 770 and 1,000 students over the past five years. While the University was founded as a faith-based institution in the early 20th century and still maintains affiliation with the founding church, the University has adapted to accommodate students of various faiths and backgrounds. As broader society increasingly recognizes the importance of diversity and inclusion, the University also has evolved to best meet the needs of the students it seeks to recruit and serve. It has implemented measures to promote diversity and inclusion to foster a sense of belonging and community, services to provide support, and respect for all students. The University's values of community and care are congruent with the aim of the project to meet the sexual health needs of students from all backgrounds.

A variety of structures and departments are in place to meet student needs. Departments within the University include over fifty academic programs, Student Life, Counseling Services, and University Health Services. University Health Services provides routine health care and screenings. The project to improve student health through increased utilization of STI screening aligned with the University's overall values and goals. However, there were specific organizational facilitators and barriers in relation to implementation of the project that were considered.

Facilitators

Conducive Implementation Site

The availability of University Health Services, its staff, and Director were primary facilitators for this project. Health Services provided an existing structure and organization for healthcare and screening services on campus, which before the implementation of the project, included the service of STI testing through an appointment with a healthcare provider. The Director and staff work together to ensure students receive evidence-based care. All staff

prioritize student health. A supportive and collaborative approach is valued by Health Services staff. Every effort is made to provide a welcoming and caring environment.

Peer Educator Program

The University's group of undergraduate peer educators was an additional and important facilitator. The student peer educator program, implemented in August 2021 through the Department of Student Life, employs peers who are focused on improving sexual health and reducing sexual and relationship violence on campus. Undergraduate students interested in becoming a peer educator apply for the position each academic year, are interviewed, provide references, and are chosen to form a group of four to six students. Students are chosen with diversity in gender, race, and sexual identity in mind to best meet the needs of the overall student population. In academic years 2021-2022 and 2022-2023, the group included four female students (one who identified as bi-sexual), two male students (one who identified as gay), and represented the racial diversity of African American, Latinx, Caucasian, and an Arab student. Vamos et al. (2020) identify that peers are an effective way to raise awareness and provide education on a college campus. The project lead, along with the University's Safer Together Coordinator, serve as trainers and advisors to this group, helping to educate the group and plan events. The author provided training and information specific to STIs and the new option for self-initiated and self-collected chlamydia and gonorrhea testing. Peer educators worked to raise awareness by including and sharing this information at their events and interactions with other students.

Office of Diversity, Equity, and Inclusion Grant

A final facilitator was a small monetary grant from the University's Office of Diversity, Equity, and Inclusion (DEI) that was awarded to support the cost of chlamydia and gonorrhea

tests and posters to advertise test availability. The University offers a small monetary grant each semester to foster and support inclusivity of a diverse student population. The grants are awarded to applicants who implement measures to address the needs of students of various race, ethnicity, gender, and sexual orientation. The goal of this project was to reach all undergraduate students and improve test utilization; therefore, grant funds intended to support this effort were a natural fit. Grant funds reduced the cost of project implementation primarily through payment for posters. Remaining funds were set aside to pay for tests for participants who identified a need. Funds prioritized testing coverage for LGBTQ students to help address the barrier of privacy particularly in this population. The money from the grant was an important facilitating factor for the project but could not eliminate the barrier of the cost of testing.

Barriers

Because the University is small and private, the primary barrier to the project's implementation was that of cost. Cost of STI testing was identified as a significant concern by Adebayo et al. (2021), the ACHA (2020), Backonja et al. (2014), Eastman-Mueller et al. (2022), and Keizur et al. (2020). Although other universities may offer STI screening at no cost, this service is not available at the project setting. Students were offered the option of billing the cost of the test to their insurance or paying out of pocket. Students who identify as LGBTQ, do not have insurance, or chose to pay out of pocket were prioritized to have costs covered with grant funds as they were available.

An additional barrier was that of added work for the staff at Health Services. The work to implement the project was done on a volunteer basis. The staff of Health Services were willing to take on the added tasks of maintaining supplies, documenting use, and processing specimens

as long as it did not interfere with regular job requirements. The project lead reviewed and followed up with students to make them aware of their results.

Another potential barrier included University and student acceptance. Because the University is faith-based, religious beliefs of some students may prohibit sexual activity outside of marriage or sex outside male-female relationships and cause them to reject the need for testing on moral grounds. This barrier was considered, but the focus on meeting health needs of all students in an inclusive way was emphasized and prioritized. Prior to project implementation, STI testing was only available through an appointment with a healthcare provider at University Health Services; acceptance and participation in a self-initiated process was unknown. A review of literature provided information about evidence-based strategies to address barriers and guide project implementation.

Chapter 2: Summary of Literature and Theoretical Framework

A search of the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline, and Health Source Nursing/Academic Edition for matches to the terms of sexual health awareness, sexually transmitted infection testing or sexually transmitted disease testing, and undergraduate college students or young adults or college students, yielded 231 studies after duplicates were removed. The search was limited to human studies published from 2011 to 2022 and in the English language. After further review, studies were excluded if they did not include sexual health awareness, STI testing, or were not related to undergraduate college-aged students. A total of twelve quantitative and qualitative studies were identified. Multiple themes were noted during the review of these studies. Themes included significant knowledge and awareness gaps related to sexual health and the importance of recommended testing, sources of information, use of tailored information content, choice of STI testing format, and barriers to testing. These themes will each be discussed more fully beginning with awareness gaps.

Gaps in Awareness of Recommended STI Testing

For students to implement recommended STI testing, it is imperative that they are aware of recommended testing as well as their personal risk and the impacts of STIs. Gaps in the knowledge of college students are consistently identified as a factor in maintenance of sexual health. In a quantitative study involving 793 college students, Keizur et al. (2020) and Sagor et al. (2016), in a randomized control trial of 103 students, identified significant limitations in understanding and awareness regarding chlamydia and gonorrhea related to transmissibility, consequences, and recommended screening practices. Multiple studies noted lapses in awareness related to risk of transmission and need for STI testing. The lapses centered around the belief that symptoms of infection must be present for transmission. These same studies identified faulty risk

perception based on absence of symptoms as a primary reason to fail to seek STI testing (Adebayo et al., 2021; Backonja et al., 2015; Eastman-Mueller et al., 2022; Keizur et al., 2020; Lustria et al., 2016; Mevissen et al., 2011; Normansell et al., 2015; Sagor et al., 2016; & Vamos et al., 2020). Studies by Adebayo et al. (2021), Anderson et al. (2016), Eastman-Mueller et al. (2022), Keizur et al. (2020), Lustria et al. (2016), Normansell et al. (2015), and Sagor et al. (2016) clearly link various measures to raise awareness to improved STI testing intention and implementation. Information and awareness were the most important factors identified to address knowledge gaps. The quality and source of the information used to fill these knowledge gaps is also an important consideration.

Sources of Information to Raise Awareness

Study findings agreed that sources of information should be accessible, respected, knowledgeable, and reliable. Healthcare providers were consistently identified as a primary source of educational information (Adebayo et al., 2021; Backonja et al., 2015; Eastman-Mueller et al., 2022; Keizur et al., 2020; Lustria et al., 2016; Mevissen et al., 2011; Normansell et al., 2015; Sagor et al., 2016; & Vamos et al., 2020). Some studies identified additional sources of education including academic faculty, peers, and Web-based resources. Eastman-Mueller et al. (2022) found that academic faculty and sexual health educators were effective at improving STI knowledge and intent to obtain STI testing in their study of 7,020 students. Vamos et al. (2020) discuss the effectiveness of peers in improving the knowledge and skills needed to implement preventative and sexual self-care behaviors in 43 undergraduate students participating in focus groups. Peers were found to be especially helpful in this age group as they speak the same language and can relate most effectively, increasing comfort and trust. The ACHA (2020) also endorse the use of trained peer educators to provide sexual health education. How information

is focused and tailored also mattered.

Information Tailoring

While all studies showed the importance and effectiveness of sexual health awareness interventions in general, four studies specifically discuss the benefits of tailoring information to college students. Lustria et al. (2016) define tailored messages or information as strategies designed to fit with a person's or group's unique needs and preferences. Sagor et al. (2016) points out that college age students' understanding of disease and perception of risk is different than adults. Lustria et al. (2016), along with Backonja et al. (2014), Sagor et al. (2016), and Mevissen et al. (2011) found that tailoring sexual health education improves both STI awareness and use of STI testing.

In a quantitative study developed specifically for men, Anderson et al. (2016) discusses the results of the '*Man Up Monday*' campaign conducted at a four-year university. The campaign was implemented to increase awareness of sexual health and chlamydia and gonorrhea testing in male students. Results show that these targeted education and awareness efforts were helpful, leading to STI testing for 139 men.

According to Lustria, et al. (2016) students are interested in learning how STIs affect them and what actions individuals in similar circumstances can and should take. Perception of STI risk in the college age population is an area that tailored information is particularly effective in addressing. They found those in the tailored information group reported significantly higher ($p < 0.001$) perceived personal relevance, attention to the message, perceived risk at post-test, and intention to get STI testing than the control group. Providing information that students can apply to themselves increases self-efficacy seems to be particularly helpful. Tailored information that initiates student action along with a testing format that is acceptable to them is important.

STI Testing Format

Choice in STI testing – how, when, and where testing is done, was examined in four studies and by the ACHA. Preferred testing is convenient, self-initiated, self-collected, private, and uses a urine specimen. Students empowered with information are more likely to demonstrate self-efficacy in utilizing testing when these criteria are available (Adebayo et al., 2021; ACHA, 2020; Keizur et al., 2020; Lustria et al., 2016; & Normansell et al., 2015).

In their qualitative study involving individual interviews of 35 female college students, Adebayo et al. (2021) describe self-initiated testing as “any form of testing requested, sought or performed by an individual in an offering site without immediate assessment and recommendation from a healthcare professional” (p. 161). They found that self-initiated STI testing can improve access and uptake of testing among college students. Cost and stigma reduction are two areas they identified as especially beneficial in self-initiating testing.

In their randomized control trial of 1065 participants, Lustria et al. (2016) found that after their tailored Web-based STI awareness-raising intervention, students were very likely to order a free at-home STI collection kit ($p < 0.01$) compared to obtaining STI testing from a healthcare provider. Keizur et al. (2020) identified that cost, followed by specimen type, and location of testing were the factors most influential in the intent to test. College students in this study preferred free tests, a urine test, and the ability to collect a specimen when they wanted. A test that would automatically send the results to the healthcare provider was also preferred by 62.9% of participants. Normansell et al. (2015) interviewed 17 female college students and found that participants wanted STI testing to be accessible, convenient, and maintain their privacy. Students said that information and testing kits made available in toilet cubicles would meet these criteria. Students who lived at home did not want test kits mailed to them because of privacy concerns.

In a meta-analysis of 47 studies, Paudyal, et al. (2015), systematically reviewed individual's experiences of obtaining self-samples to diagnose curable STIs. 88% of participants reported that self-collection was not difficult to perform, and 85% reported self-collection to be well-received and acceptable. Seventeen of the studies identified participant's preference to self-sample, rather than have a clinician perform the sample collection. In a quantitative study based at a large, United States university, Habel et al. (2018) found that a self-initiated and self-collected testing program for chlamydia and gonorrhea resulted in a 28.5% increase in testing for male students and a 13.7% increase in testing for female students. Students could go to the university health center without an appointment, having a sexual history collected, or seeing a healthcare provider. Prior to implementation of this study, students were required to make an appointment and see a healthcare provider. The researchers reported that overall, 96.3% of students were very satisfied or somewhat satisfied and 96.7% of students said the experience was very easy or somewhat easy (Habel et al., 2018).

STI testing format is an important consideration to promote utilization. Various methods to make testing more convenient and accessible can be employed to do this. The literature highlights that a 'one size fits all' approach is not best to achieve the goal of increased testing utilization. Testing format, along with addressing other barriers identified by students, can facilitate greater utilization of STI testing.

Barriers to Initiating Testing

In addition to the barrier of lack of preferred STI testing format, the concerns of cost, privacy, and stigma were identified as common barriers. Cost of STI testing was identified as a significant concern by Adebayo et al. (2021), the ACHA (2020), Backonja et al. (2014), Eastman-Mueller et al. (2022), and Keizur et al. (2020). The study conducted by Keizur et al.

(2020) found cost was the factor that had the most impact on the student's willingness to obtain STI testing. It should be noted that two of the studies done outside the United States in the Netherlands by Mevissen et al. (2011) and the United Kingdom by Normansell et al. (2015) did not include cost as a barrier as STI testing is free in these countries.

The issue of privacy is an additional concern for college students in studies by Adebayo et al. (2021), the ACHA (2020), Keizur, et al. (2020), Lustria et al. (2016), and Normansell et al., (2015). The concern for privacy related to both the actual testing process – how and where the test was conducted – and for how insurance billing and charges would be handled. Adebayo et al. (2021) note the preference of students to use the bathroom to obtain a specimen where they would not be seen or need to talk to anyone to make testing more private. Students did not want their parents to learn of their STI testing through insurance explanation of benefits. Privacy was a particular concern for non-heterosexual students who had not disclosed sexual preference to parents or the public. The ACHA (2020) lists providing STI screening at low or no cost so that students can pay out-of-pocket and avoid billing their insurance plans, as well as listing charges on student accounts generically as best practices to protect confidentiality.

Stigma associated with STI screening is noted in studies by Adebayo et al. (2020), Backonja et al. (2014), Normansell et al. (2015), and Sagor et al. (2016). Embarrassment is noted to be the biggest factor ($p < 0.05$) for failure to seek testing in the study by Backonja et al. (2014). Normansell et al. (2015) found that participants feared having their identity 'tainted' or 'spoiled' by the need to get tested. Potential embarrassment if the participants' friends or family learned about STI testing was an obstacle. In their in-depth interviews, Adebayo et al. (2021) learned participants wanted information that addressed the stigma, fear of being judged, and embarrassment they associated with STI testing. Students wanted information about STI testing

provided in a nonjudgmental, helpful, and encouraging way.

Summary of Themes from the Literature

When taken together, the themes of the importance of raising awareness, providing tailored information from a reliable source, and making a preferred format for testing available offers the opportunity to overcome barriers and improve utilization for recommended testing. The barriers of cost, privacy, and stigma may be at least partially addressed with the format of self-initiated and self-collected urine specimens. Cost could be reduced due to the ability of students to test without paying for an appointment with a provider. While summarizing the themes found in the literature, several gaps were identified and are important to acknowledge.

Gaps and Limitations in the Literature

Although the literature was consistent in identifying the importance of awareness and reducing barriers to STI testing utilization, several important gaps or limitations were identified. The first gap is the lack of consensus on the most effective strategy to raise awareness and provide education. As discussed earlier, various approaches were utilized in each study. No single method was identified as the most effective approach.

While most of the studies reviewed did not exclude individuals who identified as male, most study participants were individuals who identified as female. Men are under-represented in the studies reviewed. Only one study reviewed, (Anderson, et al. 2016), specifically looked at the impact of raising awareness and utilization of STI testing in men. An additional gap or limitation is that studies did not focus specifically on students who identify as LGBTQ or transgender. In the studies that included information about sexual orientation and gender identity, LGBTQ and transgender students made up the minority of participants. Understanding of the specific needs and preferences of this population is important but is not well-reflected in the literature reviewed.

These lapses may carry implications for the ability to generalize study findings to men, LGBTQ, and transgender students and impact the effectiveness of the project.

The final limitations are the lack of a consistent definition of what constitutes the undergraduate student population and a definition of sexual activity across studies. Several studies mentioned students who lived on and off campus and some recorded sexual activity as including genital-genital and anal sex, but these criteria were not explicitly or consistently identified in all studies. These factors may affect the ability to apply findings to this particular University. For the purposes of this project, the undergraduate student population is identified as the University's traditional undergraduate student population, living both on and off campus. Sexual activity to include oral-genital, genital-genital, and anal sex.

Theoretical Framework

To guide development and maximize the effectiveness of the project, an appropriate theoretical foundation and model for translating evidence into practice was essential. Because the project focused on promoting sexual health in college students, Pender's Health Promotion Theory was chosen. Nola Pender first developed the Health Promotion Model in 1982 and has made several revisions over time. Her theory has been applied to individuals, families, and communities, across many settings and situations. In addition, the tool has guided additional research and studies (Aqtam & Darawwad, 2018). The theory is grounded in a holistic nursing perspective, social psychology, and learning theory and provides a structure to explain and predict specific health behaviors. Pender posits that each person has unique characteristics and experiences that affect their actions and that while people are partly shaped by their environment, they also seek to create and modify their environment to achieve health (Aqtam & Darawwad, 2018). Her work guides nurses to utilize strategies and research as they help motivate individuals

to engage in health-promoting behaviors and includes self-efficacy as a central construct. The Health Promotion Model encompasses three primary areas nurses can use to assess health promotion behaviors: personal characteristics and experiences of clients, behavior-specific cognition and affect of clients, and behavioral outcomes (Marriner-Tomey & Alligood, 2013).

The core concepts of Pender's Health Promotion Model that align with the project are:

- “Persons commit to engaging in behaviors from which they anticipate deriving personally valued benefits.”
- “Perceived barriers can constrain the commitment to action, the mediator of behavior, and the actual behavior.”
- “Perceived competence or self-efficacy to execute a given behavior increases the likelihood of commitment to action and actual performance of behavior.”
- “Persons are more likely to commit to and engage in health-promoting behaviors when significant others model the behavior, expect the behavior to occur, and provide assistance and support to enable the behavior.”
- “Families, peers, and healthcare providers are important sources of interpersonal influences that can increase or decrease commitment to and engagement in health-promoting behavior” (Marriner-Tomey & Alligood, 2013, p. 403).

The changes that this project implemented began with raising awareness about the importance of utilization of recommended testing for chlamydia and gonorrhea. As identified by Pender, helping students understand the benefits of testing in a tailored and focused way would allow students to apply the awareness to themselves. Healthcare staff at University Health Services, the campus peer educator group, posters, and an announcement in the campus newspaper were used as the primary ways to influence students and raise awareness, with a

primary emphasis on work with peer educators. Awareness of personal risk is a crucial motivator. Using the information about barriers found in the literature, changes to both the environment and process of testing were made to improve self-efficacy and motivate decision-making, improving utilization. A study by Habel et al. (2018) shows that students feel both competent and comfortable using a process for self-initiated and self-collected urine specimens. By making the proposed process the new normal, healthcare providers at University Health Services facilitated utilization of this essential health-promotion behavior.

Project Implementation Model

While Pender's Health Promotion Theory provided the theoretical foundation for the project, the ACE Star Model, as discussed by White (2021) provided the specific methodologic framework for translation of evidence found in literature into implementation. This model uses five steps (or points of a star): knowledge discovery (done through literature search); evidence summary (done through a systematic review and summary of findings); translation into practice (identifying clinical recommendations); integration into practice (through individual and organizational actions/changes); and evaluation (analyzing the effect on targeted outcome) (White, 2021). This framework provided a working plan for review of literature related to chlamydia and gonorrhea testing, to summarize the findings, identify that self-initiated and collected tests facilitate acceptance and use, put this process into practice, and evaluate its effectiveness in improving utilization of testing. Having the over-arching frameworks in place, the next step focuses on the participants and the setting for the project.

Chapter 3: Methods

Participants and Setting

This project focused on all undergraduate students at the University who engage in oral-genital, genital-genital, and anal sexual activity as potential participants. Although both undergraduate and graduate students attend the University, the focus of this project was limited to the undergraduate student population because this age group has the highest incidence of chlamydia and gonorrhea infections and low utilization of recommended testing (CDC, 2021). As identified earlier in the discussion of organizational congruence, the setting for the study was a small, private university in Virginia. Planning for the project involved the director of the University's Health Services and the process was implemented on campus through the University's Health Services center.

Project Evaluation Tools and Outcomes Measured

The success and acceptance of the project were evaluated by comparing data of the number of tests for chlamydia and gonorrhea initiated during the project implementation with the number of tests used in the previous three years over the same time period. This data was obtained through the University's Health Services electronic medical record system. An additional evaluation tool of an optional, anonymous survey utilizing a QR code for participants who used the self-initiated and self-collected testing process was used. The QR code for the survey was included on the printed collection instructions provided to participants. Using a Likert scale, the survey evaluated the participant's perception of clarity of instructions, ease of collection process, willingness to use the process again, and asked participants to share their sexual orientation and gender identity. An additional optional one-question survey asked

participants how they learned of the new testing process by asking them to check the appropriate box.

Project Plan, Intervention, and Timeline

Keeping the goals of student acceptance and use of the new testing process in mind, the plan for the project was developed in collaboration with the University Health Services director. Collaboration and coordination with the director and staff were essential to success. The plan was to implement the self-initiated, self-collected chlamydia and gonorrhea testing process within the first month of the spring semester and this goal was met. Implementation of the project began with an awareness-raising campaign. Posters were distributed to all bathrooms on campus, including in the dormitories using the format Health Services has used in the past, called “Stall Stories” (See Appendix A). “Stall Stories” posters have traditionally been used to promote student health topics. Posters included information about risk for chlamydia and gonorrhea and outlined the new self-initiated and self-collected process without seeing a provider. Funds from the DEI grant discussed earlier were used to pay for the cost of posters. Posters were distributed and hung by the Health Services work-study student, peer educators, and the author by January 16, 2023.

The project lead worked with the peer educator group to provide information and help develop programs and events to inform students about the project throughout the semester. Awareness and advertisement of the project was then done by the University’s peer education group at their formal events, as well as informally through conversations. As part of their role on campus, peer educators routinely sponsor and present student activities and have a direct connection to their peers.

An announcement was written for publication in the University’s newspaper to advertise

the new process and an interview with newspaper staff was completed. These articles were published on February 16, 2023 (See Appendix B). A final method of advertisement included formatting a slide to be included in the campus's closed circuit television system. This advertisement was shown beginning January 30, 2023 (See Appendix C).

Test collection kits, instructions (See Appendix D) including the optional acceptance survey QR-code (See Appendix E), and the survey about awareness (See Appendix F) were made available for participant use beginning January 27, 2023. Test kits with instructions and surveys remained available throughout the semester, until the first week of May 2023. Test kits were available during University Health Services hours to collect a urine specimen for chlamydia and gonorrhea testing without an appointment with a provider. To allow timely processing of specimens, participants needed to go to Health Services between 8:30 and 2:30 Monday through Friday to obtain a collection kit and provide a specimen. Participants followed the instructions to collect the specimen and labeled the container with their student identification number. Once specimens were collected, Health Services staff sent the specimens to an external lab for processing using the same procedure that was previously in place. When results were received, participants were confidentially notified by secure messaging through the electronic record system of test results. Any test results indicating an infection required a follow-up appointment with a Health Services provider for treatment and face-to-face counseling.

The number of self-initiated and self-collected tests was monitored throughout implementation of the project. This data was recorded through Health Services' secure electronic records system. The total number of tests used at the completion of the project was compared to the number of tests from the same time period in the previous three years (See Table 2, Chapter 4). No identifying participant data was collected or associated with the test. Number of tests, in

aggregate, was the only information reviewed and collected. The results of the optional, anonymous surveys were reviewed for assessment of participant comfort, ease, confidence when using the new process, willingness to use it again, gender identity, sexual orientation, and how participants learned of the testing process.

Resources Needed for Project Implementation

To have a successful outcome, the project required resources. The resources needed included chlamydia and gonorrhea urine test kits, which had been previously available and used at Health Services, printed collection instructions including a QR code for the optional, anonymous acceptance survey, the survey to learn about how awareness was raised, posters to advertise the new process for testing, and people. In addition to the project coordinator, the people needed for project implementation included the peer educator student group on campus, the Health Services work-study student, the director and staff of Health Services, and the author. Project planning involved these individuals, and they were willing to assist.

Ethical Considerations/Internal Review Board (IRB) Approval

A description of the proposed project was submitted to the University's IRB Committee prior to the implementation of the project. Review by the committee president provided permission to implement the project without full board review (See Appendix G). The project was considered exempt because it did not collect individual student data or identifying information and was focused on a process improvement. The data collection process looked only at the number of tests in aggregate and survey results without any participant identification. The plan for data collection and analysis posed no risk of privacy violation or of harm to the

participants. Attention to protection of participant confidentiality and security remained a priority throughout the project implementation and during data collection and analysis.

Chapter 4: Results and Analysis

A plan for data collection and analysis was essential to allow evaluation of success and acceptance of the project and the change to a self-initiated and self-collected process for chlamydia and gonorrhea testing. Focus was placed on collection of data in a way that was accurate and maintained the anonymity and privacy of participants. Analysis of the data provided information to determine if the measures implemented during the project could be sustained and guide any process changes that were needed.

As noted in Chapter 3, data was collected from the electronic medical record on the number of chlamydia and gonorrhea tests performed during the project implementation. Results from the acceptance survey, including a question about sexual orientation and gender identity, and an awareness survey, to ask how participants learned of the availability and need for testing were collected. The results of the data collected and survey results provide valuable insights.

Data Collection Results

Test Use Results

Data on the number of chlamydia and gonorrhea self-initiated and self-collected tests was obtained from the University's Health Services electronic medical record system at the completion of the semester in May 2023. The total number of tests were counted from the second week of January 2023 until the end of the semester in May 2023. The electronic record system provided ready availability of the number in aggregate, without any link to individual participants or identification. The number of tests used during this period was compared to the number of tests used during the same time period in the previous three years. The number of tests used in the comparison time periods from 2020 to 2022 were also obtained from the electronic health record (See Table 2).

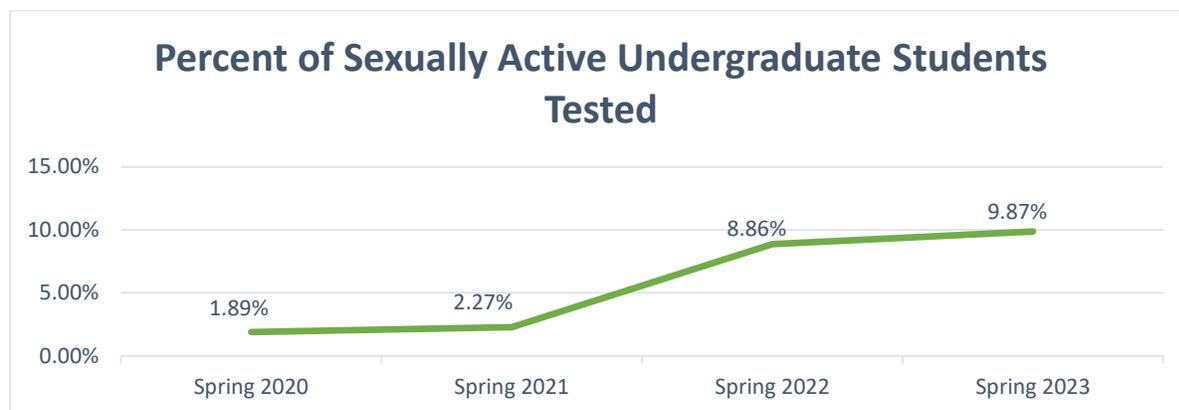
Table 2*Chlamydia and Gonorrhea Test Use*

Spring Semester	Total Number of Students	Estimated Number of Sexually Active Students^a	Number of Tests Performed	Estimated Percent of Sexually Active Students Tested^b
2020	811	324	7	1.89%
2021	770	308	8	2.27%
2022	791	316	28	8.86%
2023	786	314	31	9.87%

^a The estimated number of sexually active students was determined by 40% of the total number of students.

^b The estimated percentage of tests used is reported based on the estimated number of sexually active undergraduate students.

The percentage of test use can be compared to the 10% rate of testing found in national data from the CDC. An increase in the use of tests during the time of the project implementation is considered a positive result. Further information can be found in Figure 1. Table 2 and Figure 1 demonstrate a modest increase in chlamydia and gonorrhea tests used during the project implementation when compared to 2022, but more a robust increase when compared to the previous two time periods. The overall trend of test use is improving, but testing use by students at the University remains below the national comparison of 10% and far below the recommended use of testing for everyone who is sexually active.

Figure 1*Percentage of Test Usage (By Year)****Acceptance Survey Results***

As noted earlier, it was important to assess the acceptance of the new testing process and to identify if the process was used by participants of different gender and sexual orientation. Data from the optional, anonymous survey was collected using a five-point Likert Scale with questions asking if: instructions were clear, the respondent felt confident in collecting a specimen properly, and the respondent would use the process again. Data obtained by using questions on a Likert Scale provided an uncomplicated method for evaluation of overall acceptance of the project. A response of “one” indicated the strongest disagreement, while a response of “five” indicated full agreement. The survey also included two additional questions. One question asked the participant’s gender with options to choose male, female, or other. A final question asked about sexual partners with options to choose men, women, both, or I am not sexually active. Analysis of values from the three questions in the survey was used primarily to assess participant acceptance, confidence, and competence in specimen collection and guide any improvements indicated. The two additional questions were used to determine if the awareness and testing

process was inclusive of gender and sexual orientation. 19 of 31 participants who used the testing process completed the survey through scanning the QR code.

Responses to the question of clarity of instructions indicated that 22% of respondents agreed instructions were clear and 78% strongly agreed. For the question of confidence in using the collection process, 16% agreed they felt confident and 84% strongly agreed. For the question assessing willingness to use the process again, 100% of respondents strongly agreed they were willing (See Table 3).

Table 3

Acceptance Survey (n=19)

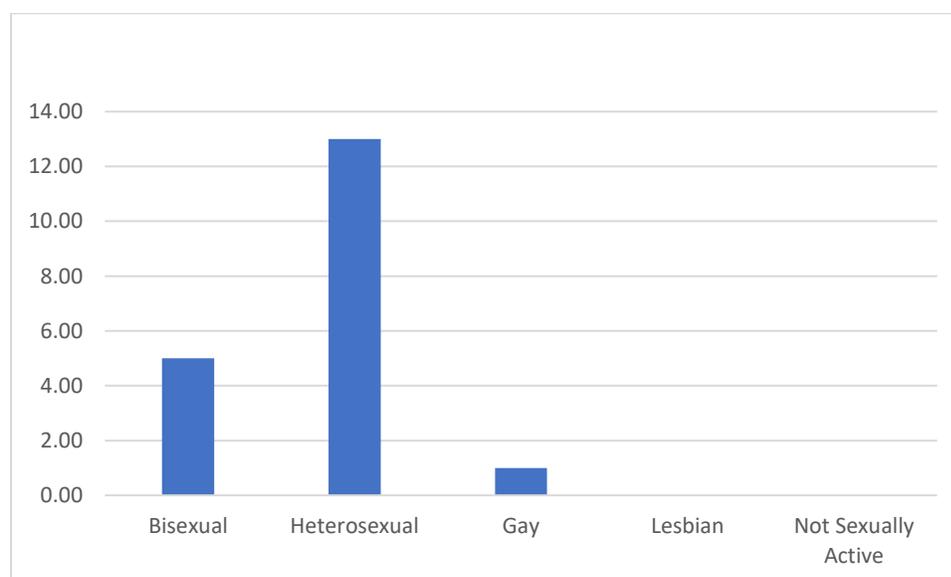
Likert Score/Percentage of Respondents:	1	2	3	4	5
Clarity of Instructions	0/0%	0/0%	0/0%	3/16%	16/84%
Confidence in Collection	0/0%	0/0%	0/0%	4/22%	15/78%
Would Use Again	0/0%	0/0%	0/0%	0/0%	19/100%

The response to the survey question about gender identity revealed that 11 of the 19 survey respondents identified as male, eight as female, with no respondent choosing other (See Table 4). This indicates that males were fairly well-represented and participated in the testing process along with females, although no respondent identified as other, indicating that transgender or non-gender identifying participants did not complete the survey. It is unknown if any transgender or non-gender identifying participants used the STI testing process since there were 31 participants and only 19 respondents to the survey.

Table 4*Gender Identification*

Gender Identification of Survey Respondents		
Gender	Number	Percent
Male	11	58%
Female	8	42%
Other	0	0%

Of the 31 participants who used the self-initiated and self-collected chlamydia and gonorrhea testing process, 19 responded to the survey question asking about sexual orientation. 13 respondents indicated that they were heterosexual, five respondents indicated that they were bisexual, and one respondent indicated that they were gay. Those who identified as heterosexual made up the majority of survey respondents at 69%, those who identified as bisexual as the next largest group at 26%, and those who identified as gay at 5%. No respondent (0%) indicated that they were lesbian or not sexually active (See Figure 2).

Figure 2*Sexual Orientation*

Awareness Survey Results

An additional one-question survey asked participants to identify how they learned of the STI testing process by choosing a response from a list including: posters, peer educators, campus newspaper articles, and other – with an opportunity to fill in a response. 15 participants responded. The majority of respondents indicated that they had learned of the testing process by seeing the posters (40%), followed closely by becoming aware through a university peer educator (33%), 27% of respondents indicated “other”, with write-in responses including: closed circuit television advertisement, nurse in Health Services, luck, by calling Health Services. No respondent (0%) indicated that they learned of the process through the campus newspaper (See Table 5).

Table 5

Awareness Survey (n=15)

Awareness Survey		
Method of Informing	Number	Percent
Posters	6	40%
Peer Educator	5	33%
Other	4	27%
Campus Newspaper	0	0%

The survey asking how participants learned of the new testing process is helpful in assessment of the effectiveness of various awareness-raising measures used. Taken together, the data from test utilization and survey results provided insight about the success of the project as a whole and helped to answer the clinical question of whether implementation of a process of self-initiated and self-collected urine testing for chlamydia and gonorrhea increased recommended utilization. The survey results are also helpful in determining if the project and awareness-raising efforts were inclusive.

Chapter 5: Discussion

Review of the data collected from surveys and the number of tests used helps to answer the clinical question of whether implementation of a self-initiated and self-collected urine testing process for chlamydia and gonorrhea would increase recommended utilization and shed light on the effectiveness of awareness-raising measures. Based on the results of this project, use of the testing process improved utilization and seemed to be inclusive of participant's needs in this setting and will become a permanent process. The use of self-initiated and self-collected urine specimens for chlamydia and gonorrhea testing showed a positive effect on test use (See Table 2 and Figure 1, Chapter 4). Based on the acceptance survey, the process seems to fit the needs of participants (See Table 3, Chapter 4). The awareness survey provided helpful information about how to reach students with health-promotion information and validated the positive influence of the University's peer educators (See Table 5, Chapter 4).

Although cost and privacy related to insurance billing was identified as a consistent and major concern for adherence to recommended STI testing by Adebayo et al. (2021) and ACHA, (2020), the cost of testing did not seem to be a barrier to test use in this setting. A project facilitator, identified earlier, was the availability of grant funds to cover the cost of testing. All participants were offered the option to use grant funds to cover testing if they did not have insurance, could not afford the cost, or did not want testing to be reported to insurance. No participant used grant funds to cover testing cost. The requirement of all students at the University to have health insurance may make cost less of a concern in this setting. It should also be noted that the use of a self-initiated testing process without the need to make an appointment with a provider automatically reduces the cost of testing since there is no charge for a provider visit. Ideally, all STI testing would be free and readily available in every healthcare setting.

The potential barrier of the additional time and work required by the project for Health Services staff was discussed earlier in Chapter 1 under “Barriers”. Every effort was made to make the process as seamless and easy to use as possible. During project implementation, meetings and check-ins with the director and staff of Health Services were held to identify any problems or concerns. A final meeting at the end of the implementation phase provided the opportunity to share thoughts about how the project worked, discuss concerns, and make any recommendations for use of the process in the future. The director and staff all endorsed the use of the self-initiated and self-collected testing process and it will be used as a permanent procedure. Staff reported that they did not find the process added additional work and identified benefits. One of the benefits identified was allowing more open appointment times for providers. Staff affirmed an additional positive aspect of the self-initiated and self-collected process, that of participant acceptance. One finding that became clear with the use of the process was that in the future, there is no need to limit test collection to the 2:30 pm time on Monday through Thursday. Once the specimen is processed and the urine sample placed in the preservative-containing container, it is stable. The only time restriction that will be needed in the future is limiting collection to 2:30 pm on Fridays since no specimens are picked-up over the weekend. There are, however, some limitations and questions that need to be considered.

Limitations

One significant limitation of the project is the variable of student’s choice of site for obtaining chlamydia and gonorrhea testing. The actual number of tests used by sexually active undergraduate students is unknown; only the number of participants who used testing through Health Services was determined for this project. Students have a choice of where to obtain testing. Options for testing outside of the campus’ Health Services include private medical

practices, walk-in clinics, and tests obtained through an online order and sent through the mail. Several local charitable organizations offer options for free STI testing, but only perform tests for syphilis, HIV, and hepatitis C. Although the local Health Department offered testing in the past, since the Covid-19 pandemic, funding and availability of STI testing has been significantly reduced and is no longer easily accessible. A way to determine the total number of sexually active students who utilized chlamydia and gonorrhea testing would be to survey all undergraduate students. Student choice of testing site is an important variable to consider but was outside the scope of the project.

An additional limitation related to the number of tests used is that the exact number of sexually active undergraduate students at the setting was not known. The percentage of tests used was determined based on the national reports of 40% in this age group, although the ACHA reports that by the fourth year of college about three-quarters of undergraduate students are sexually active (ACHA, 2022). 40% is a conservative estimate, but the actual number of sexually active students could be higher or lower. This unknown variable could affect the results of tests used that are reported for this project. Determining the number of sexually active undergraduate students on campus was not the focus of this project, but this information could be useful for more precise results.

Test numbers and survey information obtained do not provide answers to all of the questions related to additional variables of how to help this population adhere to recommended STI testing. The unanswered questions of how sexually active undergraduate students of all genders and sexual identification decide to pursue recommended testing, what most influences this decision, and how to best encourage this healthy behavior remain. While every college or

university setting has differences, these are common areas that should be explored further to help provide answers and guide future work.

Recommendations for Future Study

How undergraduate students are primarily influenced to seek recommended testing is a question that would benefit from further study. In the literature discussed earlier, many of the studies reviewed mentioned peers as a positive factor in awareness, but peer influence on decision-making was never a direct focus. Research that is specifically focused on the effect of peers and their influence on the sexual health of undergraduate students is very limited. Although not the focus of this project, results indicate that during the two years the University's undergraduate peer educators were working to raise awareness about sexual and relationship health and reduce sexual violence on campus, there was a significant increase in the use of chlamydia and gonorrhea tests (See Table 2 and Figure 1). Findings from a review by Wong, et al. (2019) indicate that use of peer educator programs was helpful in efforts to improve knowledge of sexual health topics and bring about some health behavior changes, including testing. This is an area that requires more research.

The specific needs and barriers to testing in the LGBTQ undergraduate student population is an additional area for study. This project, as well as the literature reviewed in preparation for the project, did not focus exclusively on this population. Without further study it is difficult to say if there are specific factors that affect the use of recommended STI testing in this group. Additional research could provide insight.

Recommendation for Future Implementation

The change to using a self-initiated and self-collected urine specimen for chlamydia and gonorrhea process, is well-received, is not complicated, costly, or difficult to implement and

could work in any college or university setting. It is a measure that should be more widely implemented. Further data on use of this process would be helpful. Additional study could provide more information on the use of this process and the effect on barriers such as cost, privacy, and stigma.

Plan for Dissemination

To help direct future study and work on improving utilization of recommended testing and influence positive change, findings related to this project will be shared. Sharing the results of how the change in testing process worked and the results from the acceptance and awareness surveys may provide useful information to others. Information will be shared at the project setting and with other colleges and universities.

At the University where the project was implemented, findings were first be shared with the director and staff of Health Services. This information will provide the basis for continued use of the self-initiated and self-collected testing process and validate the efforts made to implement the process. The information will also be disseminated to the Department of Student Life, specifically with the Dean of Students and the Director of Residence Life. These individuals have direct responsibility and oversight for providing services and support to students. Ensuring that they are aware of the importance and availability of this health service will help them to best meet student needs. Providing information gained from the acceptance and awareness surveys will support efforts to foster inclusive care. The University's peer educator program falls under the direction of the Department of Student Life. The information gained from analysis of the project's findings show that the work of this group is important and has positive influence on the health of the undergraduate student population. These findings validate the continued need for the program and measures to support it.

Work to disseminate findings on a larger scale will focus on sharing results with other colleges and universities. Publications and conferences from the American College Health Association (ACHA) offer the opportunity to effectively reach colleges and universities across the country. A poster presented at the annual conference in Atlanta in 2024 either virtually or in-person is one option. Future work directed to producing an article on improving STI testing on college campuses for publication by the ACHA is an additional option.

Conclusion

Entering college is an important time for many young adults. Along with the opportunity to learn, the college experience may present unique threats and challenges. New-found freedom may provide temptation and chance to try new things, including sex and risky sexual practices. As identified by the CDC (2021), the disproportionate burden of chlamydia and gonorrhea infections in the undergraduate college age population highlights the need for effective measures to raise awareness and increase use of recommended testing. While each college and university is unique, all share the responsibility of working to address sexual health needs in an inclusive and efficacious way. As demonstrated by this project to improve utilization of recommended chlamydia and gonorrhea testing in sexually active undergraduate students, use of awareness-raising – including and especially through the use of a peer educator program – and a process for self-initiated and self-collected urine specimens, offers a model other colleges and universities can implement. Additional research is needed to determine how to best meet the needs of LGBTQ students, reduce barriers, and influence positive sexual health decisions in the undergraduate student population.

References

- Adebayo, O. W., Anderson, J. C., & Wardecker, B. M. (2021). College students' preferences for information on self-initiated sexually transmitted infection testing. *Health Education Journal, 80*(2).
- American College Health Association. (2020). *ACHA guidelines: Best practices for sexual health promotion and clinical care in college health settings*. American College Health Association. <https://www.acha.org>
- American College Health Association. (2022). *ACHANCHAI: Undergraduate student reference group executive summary spring 2022*. American College Health Association. <https://www.acha.org>
- Anderson, E. A., Eastman-Mueller, H. P., Henderson, S., & Even, S. (2016). Man-up Monday: An integrated public health approach to increase sexually transmitted infection awareness and testing among male students at a midwestern university. *Journal of American College Health, 64*(2). <https://doi.org/10.1080/07448481.2015.1062768>
- Aqtam, I. & Darawwad, M. (2018). Health promotion model: An integrative literature Review. *Open Journal of Nursing, 8*(7). https://www.scirp.org/html/6-1441026_86144.htm
- Backonja, U., Roger, H. R., & Lauver, D. L. (2014). Young women's reasons to seek sexually transmitted infection screening. *Public Health Nursing, 31*(5).
- Centers for Disease Control and Prevention. (2019). *CDC releases 2019 youth risk behavior survey results*. Centers for Disease Control and Prevention. <https://www.cdc.gov/healthyyouth/data/yrbs/feature/index.htm>

Centers for Disease Control and Prevention. (2021). *Sexually transmitted diseases: Adolescents and young adults*. Centers for Disease Control and Prevention.

<https://www.cdc.gov/std/life-stages-populations/adolescents-youngadults.htm>

<https://www.cdc.gov/healthyyouth/sexualbehaviors/index.htm>

Eastman-Mueller, H., Tsung-chieh, F., Dodge, B. M., & Herbenick, D. (2022). The relationship between college students' campus sexual health resource utilization and self-reported STI testing: Findings from an undergraduate probability survey. *Journal of American College Health, 70*(3). <https://doi.org/10.1080/07448481.2020.1775607>

Habel, M. A., Brookmeyer, K. A., Oliver-Veronesi, R., & Haffner, M. M. (2018).

Creating innovative sexually transmitted infection testing options for university students: The impact of an STI self-testing program. *Sexually Transmitted Disease, 45*(4).

Healthy People 2030. (n.d.). *Youth Risk Behavior Surveillance Survey (YRBSS)*. US Department of Health and Human Services.

<https://health.gov/healthypeople/objectives-and-data/data-sources-and-methods/data-sources/youth-risk-behavior-surveillance-system-yrbss>

Keizur, E. M., Bristow, C. C., Baik, Y., & Klausner, J. D. (2020). Knowledge and testing preferences for chlamydia trachomatis, Neisseria gonorrhoea, and trichomonas vaginalis infections among female undergraduate students. *Journal of American College Health, 68*(7).

Lustria, M. L., Cortese, J., Gerend, M. A., Schmitt, K., Ying, M. K., & McLaughlin, C. (2016).

A model of tailoring effects: A randomized controlled trial examining the mechanisms of tailoring a web-based STD screening intervention. *Health Psychology, 35*(11).

Marriner-Tomey, A. & Alligood, M. R. (2013). *Nursing theorists and their work*. (6th ed.). Mosby/Elsevier.

Mevisen, F. E., Ruiter, R. A., Meertens, R. M., Zimbile, F., & Schaalma, H. P. (2011).

Justify your love: Testing an online STI-risk communication intervention designed to promote condom use and STI-testing. *Psychology & Health, 26*(2).
<https://doi.org/10.1080/08870446.2011.531575>

Normansell, R., Drennan, V. M., & Oakeshott, P. (2016). Exploring access and attitudes to regular sexually transmitted infection screening: The views of young, multi-ethnic, inner-city female students. *Health Expectations, 19*(2).

Paudyal, P., Llewellyn, C., Lau, J., Mahmud, M., & Smith, H. (2015). Obtaining self samples to diagnose curable sexually transmitted infections: A systematic review of patient's experiences. *PLoSOne, 10*(4).

Sagor, R. S., Golding, J., Giorgio, M. M., & Blake, D. R. (2016). Power of Knowledge: Effect of Two Educational Interventions on Readiness for Chlamydia Screening. *Clinical Pediatrics, 55*(8). <https://doi.org/10.1177/0009922815604597>

Steinburg, L. (2008). A social neuroscience perspective on adolescent risk-taking. *Developmental Review, 28*(1). <https://doi:10.1016/j.dr.2007.08.002>

- US Preventative Services Task Force. (2021). Recommendation statement: Screening for chlamydia and gonorrhea. *Journal of the American Medical Association*, 326(10).
<https://doi:10.1001/jama.2021.14081>
- Vamos, C. A., Thompson, E. L., Logan, R. G., Griner, S. B., Perrin, K. M., Merrell, L. K., & Daley, E. M. (2020). Exploring college students' sexual and reproductive health literacy. *Journal of American College Health*, 68(1).
- White, K. M. (2021). Evidence-based practice. In K. M. White, S. Dudley-Brown, & M. F. Terhaar, Eds. *Translation of evidence into nursing and healthcare* (3rd ed., pp. 3-25). Springer Publishing.
- Wong, T., Pharr, J. R., Bungum, T., Coughenour, C., & Lough, N. L. (2019). Effects of peer sexual health education on college campuses: A systematic review. *Health Promotion Practice*, 20(5). <https://doi:10.1177/152483991879432>

Appendix A

Stall Stories Poster for New STI Testing Process

**Stall
Stories**


Sponsored by Health Services
And
The Office of DEI

Chlamydia and Gonorrhea:

DO YOU KNOW YOUR RISK?

Here are some fast facts:

- Over half of the 26 million new STIs in the US are in people ages 15-24
- People aged 15-24 make up the majority of those affected by chlamydia and gonorrhea
- Everyone who is sexually active is at risk, but men who have sex with men are 42% more likely to get gonorrhea
- Chlamydia and gonorrhea infections may have NO symptoms, yet affect future fertility, cause pain, and increase the risk for getting HIV
- Safer sex practices can help reduce infections, but are not 100% effective

The CDC recommends sexually active people be tested at least once a year for chlamydia and gonorrhea

If you have concerns, Call Health Services

Health Services offers a new and streamlined testing process. There is no need for an appointment with a provider to test. Simply come to Health Services anytime between 8:30-1:45, Monday through Friday. It should be at least 1 hour since the last time you urinated for the most accurate results. The process is simple, private, only requires a urine sample, and is confidential.

Know your status!



Appendix B

Information for the University Newspaper Announcement

University Health Services is offering a new option for testing for chlamydia and gonorrhea beginning January 23, 2023. The new process will allow students to self-initiate testing and self-collect a urine specimen without an appointment with a healthcare provider. The process is private, confidential, and simple.

According to the Centers for Disease Control and Prevention (2021), people between the ages of 15 and 24 make up half of all sexually transmitted infections in the US and the majority of people diagnosed with chlamydia and gonorrhea infections. Because chlamydia and gonorrhea infections often have no symptoms, people affected by them may not even be aware they have an infection. These infections can negatively affect future fertility, cause pain and inflammation, and increase the risk for contracting HIV. The CDC recommends that all sexually active people be tested for chlamydia and gonorrhea at least yearly. Testing is essential for a diagnosis and treatment.

Using the new process for testing is simple! Call or email Health Services and sign-up for a time to provide a specimen. Test kits with instructions will be available in Health Services from 8:30 to 2:30, Monday through Friday. Once a specimen is provided, a Health Services staff member will contact you with results, generally within 48 to 72 hours. For those who prefer to see a provider for testing, this option remains available. Take care of your health and know your status!

Appendix C

Closed Circuit Television Advertisement

NEW IN HEALTH SERVICES: STAY TESTING
WITH STAY APPPOINTMENT

healthservices@...edu Phone Number: XXX-XXXX

Walk-In Monday-Friday, 8:30-1:45
Testing is private, confidential,
and easy

KNOW YOUR STATUS!



Appendix D

Instructions for STI Urine Collection

1. You should not have urinated for at least 1 hour before collecting this specimen. If it has been less than an hour since you urinated, please wait until it has been an hour.
2. Wash your hands with soap and warm water, rinse and dry them.
3. Do **NOT** clean the genital area before collecting the specimen.
4. Collect only a **small** amount of urine as indicated by the **black line** on the container. If too much urine is collected, do not pour off the extra – this will affect the accuracy of results. Wait to collect a specimen at another time.
5. Tightly screw the top on the container.
6. Wash your hands again with soap and warm water, rinse and dry.
7. Write your name on the sticker, place the sticker on the container, and place the container in the metal cabinet in the wall opposite the toilet.
8. Staff from Health Services will contact you with results. Results generally take 48-72 hours.

Please scan the QR code below to take an anonymous, confidential, and very short (only 5 questions) survey about your experience. Thank you in advance for your participation!



Appendix E
STI Acceptance Survey

This survey is optional, anonymous, and confidential.

For the following questions, please chose a number between 1 and 5, with 1 being the lowest rating and 5 being the highest.

1. I felt confident in my ability to collect a specimen:

(1) Strongly disagree (2) Disagree (3) Neither agree or disagree (4) Agree (5) Strongly agree

2. The instructions for collection process were clear:

(1) Strongly disagree (2) Disagree (3) Neither agree or disagree (4) Agree (5) Strongly agree

3. I would use this process again:

(1) Strongly disagree (2) Disagree (3) Neither agree or disagree (4) Agree (5) Strongly agree

4. I identify as: (1) Male, (2) Female, (3) Other (Transgender or Non-binary)

5. I have sex with: (1) Men, (2) Women, (3) Both, (4) I am not sexually active

Thank you for your time!

Appendix F
Awareness Survey

I learned about this service through:

- A poster
- The campus newspaper
- A peer educator
- Other _____

Appendix G

IRB Letter

Institutional Review Board

To: Catherine Rittenhouse
Date: October 5, 2022
Study Title: Improving Chlamydia and Gonorrhea Testing Utilization on a College Campus
Advisor:
Status: Study Exemption: Non-Research

Dear Ms. Rittenhouse,

The Board has determined that your study as written is exempt from IRB review as outlined in 45 CFR 46.102(l) which applies to activities that do not involve systematic investigation designed to develop or contribute to generalizable knowledge and therefore are not considered research.

You can read more about exempt research and explore the decision trees by following this link <https://www.hhs.gov/ohrp/regulations-and-policy/decision-charts/index.html>.

The Board wishes you the best in your research study.

Regards,

IRB Chair
Assistant Professor of Nursing