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Nurse-Run Sexually Transmitted Infections Screening Clinics on a University Campus

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Abstract

Background: Human immunodeficiency virus (HIV), chlamydia, and gonorrhea prevalence in young adults is higher than in any other segment of the population and has been increasing at alarming rates. Young adults on university campuses experience high rates of sexually transmitted infections (STI), yet many are not getting tested due to a lack of easy-to-access screening opportunities. Young men who have sex with men and minorities are at increased risk.

Methods: This DNP Project was a program evaluation of the nurse-led STI screening clinics held at a northeastern university in the fall of 2016. The evaluation included patient and provider surveys, which collected demographic information, risk factors, as well as satisfaction feedback. The health service laboratory provided data on positivity rates and numbers of tests conducted before and during the study period. The goal was to assess the effectiveness of off-site clinics in increasing testing rates, decreasing positivity rates, and in reaching high-risk students.

Results: Surveys indicated that students at high-risk for STIs or HIV attended the clinics in high numbers. Patient satisfaction was high at 95% overall, although there were confidentiality concerns related to billing insurance. The HIV and STI testing rate increased by 25% and 33% respectively between 2015 and 2016. Chlamydia and gonorrhea positive test rates increased between 2015 and 2016. Posters and the website were the most noted method of communication. Staff satisfaction was high, 67% of staff indicated a need for increased staffing.

Discussion: Nurse-led STI clinics were able to increase STI and HIV screening opportunities particularly for those at increased risk for STI or HIV acquisition. Positivity rates are increasing nationwide and increased awareness, screening and treatment is needed.

Keywords: ***sexually transmitted infections, college health, screening***

Introduction and Background

Universities have a mission broader than just being institutions of higher learning. They are the community and homes of the students who live, work, and learn there, and as such they have a responsibility for the health and safety of the students they serve (American College Health Association [ACHA] 2012). Young adults suffer disproportionately from sexually transmitted infections (STIs) as compared with other sexually active segments of the population (Workowski & Bolan, 2015). Prevalence rates of chlamydia and gonorrhea are the highest in young females; furthermore, it is estimated that one of every two sexually active persons aged 15-25 years old will acquire an STI (Workowski & Bolan, 2015). The Centers for Disease Control (CDC, 2015) estimates that youth accounted for 26% of all new human immunodeficiency virus (HIV) diagnoses in 2010, and it is estimated that over 50% of these youth have not been tested and are unaware of their infections.

Testing for human immunodeficiency virus (HIV) and STIs has evolved since the adoption of the Affordable Care Act (ACA), which promotes preventative screening through insurance reimbursement (Workowski & Bolan, 2015). Formal written consent and individual counseling for HIV testing were found to increase barriers to testing by increasing the complexity of the procedure (U.S. Preventive Services Task Force [USPSTF], 2014). Government supported testing programs are decreasing, as testing is now considered routine and covered by health insurance. In the fall of 2015, the FDA approved a fourth generation whole blood, HIV test for point of care testing, therefore allowing off-site clinics the ability to provide the most up to date testing available on the market.

While regulations involving testing and reimbursement have evolved to become more conducive to routine screening, there is much progress to be made in terms of meeting the STI

screening needs of students. Students have been found to have low rates of STI testing, yet many engage in high risk sexual behaviors, have low rates of barrier device use, and incomplete knowledge of preventive sexual health practices (ACHA, 2015; Dennison, Wu, & Ickes, 2014). Social media is emerging as a new variable in STI acquisition; it was found that networking apps as a means for meeting partners for sex of men who have sex with men (MSM) is correlated with increased incidence of STIs (Beymer et al., 2014; CDC, 2015). Students have been found to have low rates of STI screening due to scheduling conflicts, long wait times, embarrassment, and payment concerns (Eastman-Mueller, Zhang, & Roberts, 2015; Moore, 2013).

In order to address the heavy burden of STIs in the student population, colleges and universities need to make sexual health programs a priority issue on campus. A positive association was found between the level of sexual health services colleges provided and the sexual health behaviors of its students (Eisenberg et al., 2013). To improve the delivery of sexual health services to college students, an evidence-based practice of providing STI screening opportunities through non-clinical based testing programs run by college health nurses was implemented. This DNP project evaluated the off-site STI and HIV testing clinics conducted at a large northeastern public university. The goal was to assess if they successfully increase HIV screening, if they reach high risk students, if the students who attend the clinics are satisfied with their health care experience, and if the staff who work at the clinics were adequately trained and are satisfied with the testing, and treatment protocols and standing orders.

Problem Statement

Young adults, including college students are at high risk for STI and HIV infection. The low rate of barrier device usage, exposure to multiple partners, and a perception of decreased risk, compounded by screening barriers that include difficulty obtaining timely

appointments, long visit wait times, mistrust of medical settings, and the asymptomatic nature of STI presentation are contributing factors. Recent changes in government funding, insurance reimbursement, and testing requirements have impacted the public health response to this epidemic. In an effort to ameliorate this problem, colleges and universities, need to provide coordinated sexual health services and outreach on campus, which includes the provision of STI screening clinics in off-site locations. An essential component of the STI clinics is program evaluation to ensure that they are meeting their established goals.

Review of the Literature

Clinical guidelines for the testing and treatment of STIs, including HIV have been developed by the CDC and the US Preventive Services Task Force (USPSTF). In general, they differ very little from each other in the majority of their recommendations (USPSTF, 2014; Workowski & Bolan, 2015). The exception to this is that the CDC recommends HIV testing for all persons aged 13 – 64 regardless of risk status, and the USPSTF recommends HIV screening only for persons at increased risk (USPSTF, 2014). Both the CDC and the USPSTF recommend that all sexually active women under age 25 years old get tested for chlamydia and gonorrhea, and women over 25 should also get tested if they engage in high risk sexual activity (USPSTF, 2014; Workowski & Bolan, 2015).

Young men are not recommended for routine chlamydia or gonorrhea screening unless they engage in high-risk sexual behavior, or the population served by a clinic is considered in itself to be a high-risk setting such as a prison or adolescent health site (USPSTF, 2014; Workowski & Bolan, 2015). Young men who have sex with men (YMSM) are recommended for both gonorrhea and chlamydia testing including from pharyngeal and rectal sites, if appropriate for the individual's current sexual practices (USPSTF, 2014; Workowski & Bolan,

2015). The CDC recommends HIV screening for all sexually active persons regardless of age, or location of testing, or type of clinic setting. Screening for syphilis is recommended for men who have sex with men and pregnant women (USPSTF, 2014; Workowski & Bolan, 2015). No other STIs are recommended for routine asymptomatic screening in young adults and were not included in the off-site STI clinics.

The STI risk assessment is a critical component in planning any STI clinic. The nurse and patient must make a determination of whether a patient is considered to be at risk for any given STI. According to both the CDC and the USPSTF, high-risk sexual activity includes multiple partners, inconsistent barrier device use, and engaging in sex while under the influence of alcohol or drugs, or injection drug use (USPSTF, 2014; Workowski & Bolan, 2015). The CDC recommends the Five P's approach to a risk assessment: partners, practices, prevention of pregnancy, protection from STIs, and past history of STIs are elicited to target testing and counseling. The CDC developed a brief sexual history tool, which can be quickly administered to students for risk assessment purposes (Workowski & Bolan, 2015). A university-based outreach STI clinic should therefore be prepared to briefly assess and screen for chlamydia, gonorrhea, HIV, and syphilis.

The benefits and feasibility of outreach testing clinics has been explored in numerous studies and guidance tools. In implementing the STI screening guidelines in a southern university setting, non-clinical venues were found to provide reliable testing options and were accessed by students who did not typically seek care in traditional health care sites (Przybyla, 2013). Campus health services program managers can utilize the CDC-developed, non-medical HIV testing implementation guide to assist them in the delivery of off-site HIV testing, which, when provided in conjunction with traditional clinical screening, can provide more comprehensive

testing options as compared to either method alone (National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, n.d.).

A systematic review of strategies for outreach for chlamydia and gonorrhea screening was conducted in the U.S. and Australia and found that outreach yielded a high rate of test positivity, and that the most effective venues for encouraging participation were local trusted sites such as community centers, sporting venues, and health-fairs, a walk-in model was found to be the most preferred (Hengel et al., 2013). College HIV testing in outreach settings was compared with testing in medical settings for 1,233 college students, outreach settings were found to be particularly successful in reaching minority and high-risk groups (Przybyla, 2013). The literature review supports STI screening clinics implemented in outreach venues on college campuses.

The marketing of the outreach screening clinics is another crucial element to a successful campaign. Researchers found in a survey of 4017 youth that the CDC “Get Yourself Tested” campaigns successfully increased testing by 25% in high-risk youth in seven communities who were targeted by the campaign. Peer educators and social media were key elements of the campaign and helped to normalize and de-stigmatize testing (Mcfarland et al., 2015).

Numerous studies have explored the STI testing behavior of college students and have reported associations between a lack of symptoms and a lack of testing due to a deficit of perceived risk (Backonja, Royer, & Lauver, 2014; Dennison et al., 2014; Moore, 2013). Sexually active students engaging in high risk sexual activity were also found to have a low rate of HIV, and STI testing, with rates estimated from 5 to 36% in the various college-based surveys reviewed (ACHA, 2015; Dennison et al., 2014; Moore, 2013; Trepka & Kim, 2010). Non-traditional testing sites have been found to be preferred sites of testing by young men who have

sex with men and African American female students; these groups were less likely to seek testing in medical settings (Llewellyn, Sakal, Lagarde, Pollard, & Miner, 2013, Przybyla, 2013).

Also fundamental to the provision of integrated sexual health services on a college campus is a consideration of who holds the responsibility for sexual health. Lechner et al. (2013) found through go-along interviews with 78 students at five different colleges that students have expectations of four-year colleges to provide sexual health services. These expectations include frequent communications as to how to access these resources; they believe that colleges hold the responsibility in both offering and marketing sexual health resources on campus (Lechner et al., 2013). Colleges should optimize campus resources through coordinated collaborations with health services, wellness centers, student affairs, and communications professionals. Students on campuses that offered sexual health programs were more likely to use a condom or birth control during intercourse than on campuses with fewer resources (Eisenberg et al., 2013).

On campuses that do not provide sexual health programs such as STI screening clinics, primary care provider individual health appointments, and condom distribution programs, actual behavioral changes are not likely to occur (Eisenberg et al., 2013). Integrative and collaborative approaches to sexual health are the purview of universities and colleges. As a result of this literature review, best practices found included offering condom distribution programs, STI screening utilizing CDC guidelines at health centers and in off-site clinics, and social marketing of services and prevention messages through multimedia channels, including social media. Further, universities and colleges have a responsibility to evaluate their STI screening and prevention programs in order to ensure student and provider satisfaction and ensure best practices are incorporated in order to maximize the effectiveness of such programs.

Theoretical Framework

Healthy People 2020 and the Healthy Campus 2020 initiatives are frameworks from which to examine the problem of STIs in the college population (HHS, 2010; ACHA, 2010). Both of these initiatives utilize the ecological model as their theoretical framework. In conceptualizing the STI outreach program on a university campus, the ecological model aligns well with these platforms and was utilized. The ecological model incorporates population and individual determinants of health into its focus and interventions; see appendix A for diagram of the model (McLeroy, BiBeau, Steckler, & Glanz, 1988).

This model offers a multifaceted, interrelated view of health, which is dynamic and incorporates environmental factors interacting with individual factors to produce health status and behaviors, which are the outcomes of interest (McLeroy et al., 1988, p. 355). In the model the outcomes of interest are determined by public policy, from local to global. They include community factors, which involve environmental determinants and the relationships between each other (McLeroy et al., 1988). There are institutional factors such as the characteristics of the organizations with which the individual interacts. Additionally, there are the interpersonal processes and social forces, and finally the intrapersonal forces which range from attitude to genetic predisposition (McLeroy et al., 1988).

When applying the ecological model to the problem of STIs in college students, the public policy factors act as predominate factors, having recently affected HIV testing regulations and insurance reimbursement models with the adoption of the ACA. The environment, the location chosen to hold and host the clinics, the ease which students can access these sites, and the privacy allowed within the space are all important elements. The campus institutional factors include the community climate of readiness, and prioritization of increased screening resources

to be able to deliver and communicate the services. The interpersonal factors include the social and cultural dynamics, and the relationships both in person and virtual which influence the individual's health behavior. The intrapersonal factors of an individual, their predisposition towards risk, and their attitudes and beliefs all interact with their decisions to engage in high-risk behavior, and to seek screening tests. Also included is whether to take the necessary actions steps to protect themselves from STIs and whether they will come to a clinic to get tested. All of these factors intersect and should be addressed in evaluating a sustainable program adoption on campus.

Methods

Setting and Resources

The setting is a university with a large residential campus of 13,000 students, with a total enrollment in 2016 of over 30,000 undergraduate and graduate students (At a glance, UMass, 2016). It is located in a college town in the Northeastern United States with approximately 35,000 residents including the students who reside on campus and in the community (At a glance, UMass, 2016) There are no sexual health clinics located in the college town, the closest sexual health clinic is eight miles away.

University Health Services (UHS) is the ambulatory care college health facility located on campus, which has 21 providers, it is open seven days a week during the academic semesters. Wait times for walk-in visits vary depending the time of day but average one to three hours during popular afternoon hours. It has 13 registered nurses one of which is the public health nurse and two nurse managers and its own laboratory services, in-house billing department, and pharmacy. It is the lead agency in conducting the STI clinics in which the public health nurse is the program manager.

University Health Services established and committed to a sustainable sexual health program through the support and promotion of STI screening and sexual health clinics, which included a communications campaign. A coalition of stakeholders was engaged to launch and refine the campaign in the 2016 academic year. The media and marketing aspects of the program were rolled out simultaneously through the UHS website, the student newsletters, the digital display boards and posters throughout the campus. A social media campaign was included in the dissemination of the program via Twitter and Facebook.

The evidence demonstrates that the changing landscape of ACA regulations, new testing options, and recommendations from the CDC all combine to make this program a logical priority for a university setting. The American College Health Association (ACHA) has listed sexual health as one of its ten health priorities and college campuses across the nation are developing innovative programs to address this need (ACHA, 2010). The CDC has developed youth sexual health guidelines to provide the tools and evidence needed to address the problem; and the Massachusetts Department of Public Health has passed HIV testing regulations, which facilitate the process. Campus leaders in student affairs and student health are supportive of the program through the allocation of resources of staff, services and supplies. University Health Services does accept health insurance for the laboratory testing, therefore making the program self-sustaining once the needed on-campus resources are allocated.

Description of the group, population or community. The target population consisted of sexually active students, graduate and undergraduate, but especially those at high risk of acquiring a STI, such as women, and men who have sex with men (MSM). All students were eligible to use the services of UHS and all are required to have either private or university funded health insurance. Current UHS resources include STI screening by an appointment basis by

physicians and nurse practitioners, in the general medical clinics and the women's health clinic. The staff supporting the STI clinics included registered nurses (RNs), lab technicians, and reception staff, some of which are student employees.

Organizational analysis of project site. The champion for the program was the campus public health nurse who was the primary organizer and contact for the clinics and communication campaign. Key stakeholders included the Director for the Center for Health Promotion, the Stonewall Center director, and UHS administrators, the executive director and the clinical services director whose roles were that of medical director, consultant, facilitator, and advocate for the program. Key staff roles included ambulatory care nurses at UHS, the UHS laboratory manager and lab technicians, information technology support staff, billing staff, and communications and marketing staff for student affairs.

Facilitators and barriers. Facilitators were the campus champions who support the outreach plan. The executive directive of University Health Services was supportive of the program and committed UHS resources of staff and supplies to the clinics. The UHS medical director facilitated the clinics through the review and signing of standing medical orders for testing and treatment at the clinics. The clear objectives and benchmarks that have been developed and established by the ACHA Healthy Campus 2020 initiative provides national data from universities throughout the U.S. which will provide national benchmarks with which to gage its progress (ACHA, n.d.). Positive patient experiences early in the intervention garnered much needed administrative support. The campus community was united by numerous communication systems such as email, websites, Twitter accounts, and residence hall posters, which facilitated the communication process.

On a large university campus there are numerous bureaucratic steps that must be

accomplished in mounting a communications campaign. This sexual health promotion campaign was extensively vetted by administrators and sufficient time for the required administrative oversight.

Data Collection

The program evaluation utilized an ecological framework, collecting data on individual attitudes and behaviors as well as examining factors that interplay with these behaviors. Qualitative and quantitative data including anonymous patient surveys (Appendix B) and staff feedback was collected and evaluated by the DNP student. The staff were distributed a survey utilizing a Survey Monkey tool.

In the patient paper based survey, students who attended the seven nurse-led STI clinics held in the fall semester of 2016 were asked how they heard of the clinic, as this will help guide future communication plans. Student demographic data and risk assessment data were collected: attendee's age, gender, sexual orientation, number of partners and use of barrier devices which were then compared with the ACHA National Health Assessment II survey (ACHA, 2016).

This survey was anonymous and voluntary and offered to all clinic attendees as they entered the clinic. The survey was given to students as they arrived at the clinic accompanied with written and verbal instructions regarding its purpose and how to complete it. The receptionists initiated the survey and it was further explained and reinforced by the clinic nurses when they conducted the sexual health assessment. There was a secure box located away from the traffic where students dropped off their surveys as they exited the clinic.

The willingness of students to use their family insurance plan to cover the costs of testing was a potential barrier to testing. There was a risk that the explanation of benefits (EOB) report that is sent to the subscribers billing address, may include the name of the test which was

conducted, thus leading to disclosure to parents (Workowski & Bolan, 2015). A goal of the STI clinics was to normalize STI testing, much like the use of insurance to cover the cost routine laboratory tests, therefore the same is a goal with STI testing. This was evaluated by a question regarding insurance billing that was included on the clinic survey. The aim is to consider the interplay of public policy upon individual behavior.

Goals, Objectives, and Expected Outcomes

The goals of the program evaluation included assessing whether off-site clinics make testing easier to access by being convenient, low-stress, and non-judgmental, therefore increasing the number of students who would get tested and treated including those at highest risk for STIs. An evaluation of a program which aims to normalize and de-stigmatize testing was the overarching goal of the project. Another goal through marketing of the clinics was to increase awareness for the need to get tested, and to prompt more students to seek testing at traditional medical settings as well.

The ACHA Healthy Campus 2020 objectives in sexual health aligned with the proposal (ACHA, 2015). The first objective developed by the ACHA is to, “reduce the proportion of students who test positive for chlamydia as reported by their university health services in the last 12 months” (ACHA, Healthy Campus 2020 Student Objectives: STD-1. 2010). In 2010 the ACHA baseline for positivity was 3.4% of students aged 18 or over who were positive for chlamydia, the goal is to decrease this amount by 10% by 2020 to reach a positivity rate of 3.1% (ACHA, 2010).

A second Healthy Campus 2020 outcomes objective, which aligns with the STI clinic outreach intervention, is to “increase the proportion of students who report having ever been tested for HIV” (ACHA, Health Campus 2020 Student Objectives, HIV-14, 2010). The metric

that was used to indicate an increase in HIV testing was the number of HIV tests; both laboratory drawn and point-of care obtained pre- and post- intervention. This metric provides UHS specific testing data, and was used to answer questions such as are fewer people coming to UHS for STI testing as a result of off-site testing, where no overall net gain in numbers of students tested is seen.

Summary of Program Evaluation Goals

- Evaluate the effectiveness of outreach clinics in reaching students at high-risk for acquisition of STI's as evidenced by attendees with multiple risk factors: MSM, Minority students: Black or Hispanic, multiple partners, women.
- To determine which communication methods were most effective at reaching students in encouraging testing in the screening clinics.
- To reduce the proportion of students who test positive for chlamydia in the 2016 – 2017 academic year by 10%. Baseline positivity for the 2015 – 2016 academic year was 4.0%, goal is for a rate of 3.6 % positivity. The UHS laboratory provides this metric in aggregate, no individual patient identifying information will be included.
- To increase the amount of HIV tests conducted by the UHS lab and UHS nurses via point of care testing by 10% in the 2016-2017 academic year

Implementation Plan

The implementation plan for the evaluation program used a MAP-IT framework as offered by the Healthy People 2020 program developed by the Office of Disease Prevention and Health Promotion (ODPHP). The ACHA adopted the MAP-IT framework tools for use by college health professionals in the Healthy Campus 2020 MAP-IT implementation tool kit

(American College Health Association [ACHA], n.d.). This tool kit includes brainstorming tools, self-assessment, prioritization, and communication worksheets to guide the program during the implementation.

1. **Mobilize.** A coalition of campus stakeholders and staff were mobilized to determine the commitment required, the scope of the project, and the desired outcome. Members included student affairs communications and marketing staff, health promotion director, LGBTQ center director, medical director, student leaders and advocates, and MDPH consultants.
2. **Assess campus needs and climate,** existing baseline data was gathered such as numbers of HIV and STI of tests from 2015 and 2016, ACHA benchmarking data, and percent of testing positivity in the past two years (ACHA, n.d.).
3. **Planning:** Best practices based on evidence from the National College Health Survey II was reviewed at this stage. The survey tool was developed, the process for distribution, the collection process and the compilation of data were all planned.
4. **Intervention:** The program evaluation began in the fall semester of 2016 and ran for the seven clinics that were held during that time frame. Education of clinical staff occurred throughout the year as new staff were on boarded into the program. Brief clinic debriefings and review of survey comments were done to get real-time feedback and make needed immediate adjustments. Social media was targeted to high-risk students and the general student body through the UHS Twitter feed.

5. **Tracking:** The data was disseminated to campus stakeholders, and shared with other college health services via regional conferences of college health professionals. Preliminary data was shared via a clinical conference at UHS in the late fall of 2016.

Data Analysis Procedure

Results of the quantitative data from the patient surveys were compiled into an excel database and analyzed utilizing descriptive statistics, which were then compared against established benchmarks from ACHA surveys. Descriptive statistics regarding the number of sexual partners, use of barrier devices, and type of sexual activity were compared against data from the 2016 National College Health Assessment survey. Results of chlamydia and gonorrhea positivity percent were compared against the benchmarks as established by the ACHA 2015 PAP and STI survey results (Eastman-Mueller et al., 2015). The qualitative data from both the patient and provider surveys was examined and compiled into commonalities and similarities.

Cost-Benefit Analysis/Budget

The off-site clinics and the marketing outreach recommendations were funded through insurance reimbursement for the laboratory services and associated nurse visit. While it is true that insurance reimbursement for an STI screening visit with a physician or a nurse practitioner is at a higher rate than for a registered nurse visit, the students who are seen at an off-site clinic are additional patients who would not otherwise be seen in a traditional provider appointment. A financial analysis of all STI screening visits was not included as a part of this program evaluation. It is unknown if all the costs for laboratory tests were fully reimbursed by insurance, or if there were costs to patients due to denied coverage. For example, it is unclear how frequently insurance will reimburse the cost of screening for high-risk patients who receive

screening more than once a year. This analysis would be a beneficial component of a future program evaluation.

The cost of communications for STI screening marketing included staff time of the public health nurse and communication professionals on campus. Additional costs included the printing of posters and table tents. The benefits to the sexually active student are increased awareness of the need for and access to STI and HIV screening. UHS benefits from the increased visibility on campus as the sponsoring agency although this effect is difficult to quantify.

Timeline

The program evaluation was implemented from September 2016 through January 2017. Seven clinics were held during that time period during which surveys were distributed, collected, and compiled into a database. A presentation to the New England College Health Association occurred in November 2016 where the screening clinics and program evaluation project early results were disseminated to 45 college health professionals. Two other presentations to provider and health educators occurred in early December, of 2016. Clinic staff members were surveyed and laboratory statistics were compiled and collected in January of 2017.

Ethics and Human Subjects Protection

In the development and dissemination of the program evaluation there was no direct risk to human subjects. In the off-site clinics, all aspects of clinic functions operated under HIPAA regulations by paid staff of University Health Services. Patient confidentiality was protected throughout all steps of the clinics, similar to a clinic that is located at University Health Services. In evaluating the clinics and outreach marketing of the clinics, the anonymous and voluntary survey was offered to all participants of the clinic. Each clinic participant was given a survey at check-in with written information explaining that it was both anonymous and voluntary.

Completed surveys were returned to a sealed receptacle that was located at the clinic exit. The survey results were used to gather data on the demographics, risk factors, and communication method that encouraged them to get tested and were used to guide clinic and communication planning. There was no patient identifying information on the survey, nor were any patients required to complete the survey if they did not wish to participate. Institutional review board at the University of Massachusetts granted a waiver for the project in August of 2016 (Appendix C).

Evaluation

There were a total of 388 total patients seen and 286 surveys returned during the seven clinics, which resulted in a return rate of 74%. A total of twelve staff members worked in the seven clinics consisting of registered nurses, laboratory technicians, certified medical assistants, and receptionists. Some staff were student employees or student public health interns of the health center; these students were subject to the same confidentiality agreements as the regular employees of the health center. Nine staff surveys were completed for a response rate of 75%. The UHS laboratory provided aggregate numbers of total tests done for gonorrhea, chlamydia, HIV for 2015 and 2016, as well as the overall positivity rate per month during the study period. No individual patient identifiers were included in the laboratory reports.

Demographics

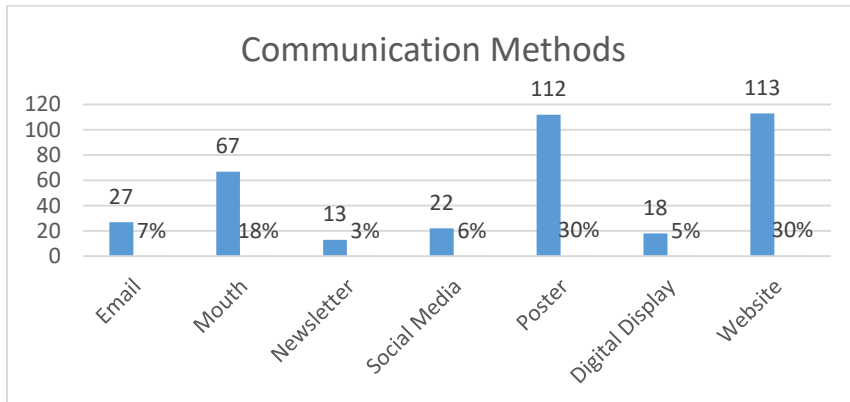
The age of respondents to the patient survey ranged from 17 to 34 years old. The mean age was 20.8 years with a median of 20 years. The patients self-identified themselves as 51% female, 48% male and 1.4% other, which included agender and transgender patients. During the 2016 academic year, the University identified the sex of the enrolled students as 51% male and 49% female, there were no other categories for gender provided. Eighty-nine percent of the patients surveyed indicated they were undergraduate students and 11% were in graduate school.

Of respondents, 56% lived on-campus and 44% off-campus. There were three respondents who attended the clinics that were university staff or faculty.

Among patients surveyed, those that identified race on their survey (n=233) were found to be 74% white, 10% Black, 8% Asian, and 8% Hispanic. In 2016 at the university the racial distribution of enrolled undergraduate students was 75% White, 11% Asian, 7% Hispanic, and 4% Black (UMass, Diversity matters: data, 2016). While White, and Hispanic students attended the clinics in the same proportion that attend the university, Black students attended the clinics at over twice the proportion that attend the university during the period of program evaluation, the fall of 2016. This increase in proportional representation indicates an increased preference to take care of their health in an alternative setting

Communication

The patient surveys ask participants to identify all communication methods that notified them of the clinics; they could choose more than one method. The respondents indicated that the posters in the resident halls, dining commons, and academic buildings, and the UHS website were the most frequent at 30% each. Diagram 1 displays the frequency of the communication methods noted by survey respondents. Word of mouth was noted in 18% of the responses, emails from the Stonewall Center at 7%, social media at 6%, digital displays at 5%, and the student newsletter was 3%.

Diagram 1: Communication Methods Frequency

Posters and the UHS website were the primary sources of information regarding the clinics, word of mouth was secondary and social media and other forms were tertiary.

Risk Factors

Participants were asked if they had sex with men, women, or both, this response was correlated with the gender of the respondents to determine if they engaged in sex with partners of the opposite sex, same sex, or with both the opposite and same sex. It was found that 74% engaged in sex with partners of the opposite sex practices while 13% engaged in sex with partners of the same sex, and 12% engaged in sex with partners of both the opposite and same sex activity, see table 4. In the men that responded to the survey (n=134), 34 (25%) indicated that they engaged in same sex activity, and 12 (9%) indicated they engaged in bisexual activity. Of women who responded to the survey (n=144), 3 (2%) responded they engaged in only same sex behavior while, 20 (14%) indicated they engaged in bisexual activity, see table 1.

Table 1 Sexual Preferences According to Gender*Sexual Preferences According to Gender*

	Male (n=134)	Female (n=144)	All Respondents (n=XX)
Engaged in sex with opposite sex partners	88 (66%)	121 (84%)	209 (74%)
Engaged in sex with same sex partners	34 (25%)	3 (2%)	37 (13%)
Engaged in sex with both opposite and same sex partners	12 (9%)	20 (14%)	32 (12%)

Survey participants' sexual behavior indicated that 25% of the men engaged in same sex activity and 9% in bisexual activity, an overall 34% having engaged in some same sex behavior. In comparing this data with national estimates on sexual behavior in young adults a 2011-2013 National Survey of Family Growth found that in adults aged 18-24, 6.2% of men engaged in same sex activity (this includes homosexual and bisexual) and 17.2% of women have engaged in same sex activity (Copen, Chandra, & Febo-Vasquez, 2016).

Participants were asked how many partners they had in the past 12 months; the responses ranged from none to over 30. The mean number of partners for women was 3.9, and for men the mean was 5.3. Data from the National College Health Association II (NCHAI) survey from the

spring of 2016 showed the mean for women was 1.94 partners, and for men it was a mean of 2.57 partners (ACHA, 2016). The NCHA II survey data for numbers of partners in the past twelve months showed that 9.4% of respondents had four or more sexual partners. In the STI clinic data 52% of respondents had four or more partners in the past twelve months (ACHA, 2016).

Table 2: Number of Partners in 12 months, Comparison of STI Clinic and NCHAI data

Number of Partners in 12 months, Comparison of STI Clinic and NCHAI data

	Mean Partners Men	Mean Partners Women	% 4 or more partners
STI Clinic Data	5.3	3.9	52%
NCHAI Data	2.57	1.94	9.4%

In comparing number of partners from the NCHA II data of a national sampling of all college students to those who attended the STI screening clinics, it appears that those who attend the screening clinics had more partners.

Table 3 displays the type of sexual activity respondents had engaged in the past 30 days, as well as their estimated use of barrier devices with vaginal or anal/rectal sexual activity. There was no question regarding the use of barrier protection for oral sex included on the survey. Participants were also asked if they used barrier devices when engaging in vaginal sex in the past 30 days.

Table 3: Type of Sexual Activity and Use of Barrier Device in Previous 30 Days

Type of Sexual Activity and Use of Barrier Device in Previous 30 Days

	Vaginal	Oral	Anal
Sex Practice: STI Clinic	84% (210)	86% (216)	16% (41)
Sex Practice: NCHAI	45%	43%	5.4%
	Always	Sometimes	Never
Barrier Used Vaginal: STI Clinic	23%	60%	17%
Barrier Used Anal: STI Clinic	36%	19%	45%
Barrier Used Vaginal: NCHA II	47.8%	*	*
Barrier Use Anal: NCHA II	27.5%	*	*

* Data not reported

In comparing the NCHA II survey results with the data from the clinics, more students attending the screening clinic engaged in anal sex. Less than half, 23%, of the STI clinic students

used condoms mostly or always for vaginal sex as compared with the NCHA II, 47.8%. Always use of barrier device when engaging in anal sex was higher in those attending the STI clinics as compared with the national data.

Patient Satisfaction

Patients were asked if they had any concerns regarding the billing for the services they received at the clinic. Eighty percent responded they had no concerns, while 20% indicated they were concerned. Comments regarding the billing question related to concerns that that parents would learn of the testing conducted through the bills sent home. A few patients thought that the services were free, no charges at all.

Ninety-eight percent of patients responded yes, that they were satisfied with the care that they received; comments were positive such as “it was great”, “the staff were extremely nice and informative”, “it was convenient”. There were three comments in the first clinic that patients didn’t want their name called for others to hear, as a result a patient numbering system was immediately enacted. A walk-in model was preferred by 67% of the attendees, while 19% responded either walk-in or scheduled appointments would be fine, and 14% preferred a scheduled appointment.

Staff Survey

All nine respondents responded yes they had attended a training session, read the protocols, and felt prepared and comfortable to perform their duties at the clinic. All respondents indicated that yes, they believed the clinics were a beneficial service for the students and all indicated that they believed they should continue and they were willing to continue to work at the clinics. Suggested improvements were solicited in the surveys. Six of the staff responded that the clinics required improved staffing to cover for breaks and lunch. One staff person thought

there should be more clinics each semester, and two responded that staff from the Center for Health Promotion should help at the clinics by providing students with increased sexual health education.

Laboratory Data.

Table four displays the laboratory provided data on the number of STI and HIV tests done in 2015 and 2016. Testing for detection of chlamydia and gonorrhea is done using a nucleic acid amplification test (NAAT), all samples obtained from patients from any site; urine, rectal, pharyngeal, test for both bacteria is included in the numbers of tests done. The laboratory also provided aggregate data on the positivity of testing done for both years.

Table 4: UHS Laboratory Testing 2015 and 2016

A comparison of UHS Laboratory Tests done in 2015 and 2016

	2015	2016	% Increase
HIV tests	1,351	1,678	24%
NAAT tests	3,924	5,220	33%
Chlamydia (+)	4%	5%	25%
Gonorrhea (+)	0.6%	0.7%	17%

In 2015, UHS conducted 1,351 HIV tests, both laboratory drawn and point of care (POC) done at the screening clinics, in 2016 UHS conducted a total of 1,678 HIV tests. This is an increase of 327 tests done in 2016, or 24%. A total of 626 POC HIV tests were conducted by

nurses in 2016, and 310 POC HIV tests done in the first year these were offered in 2015. In 2015, UHS laboratory ran 3,924 NAAT tests, in 2016 UHS ran 5,220 tests for the detection of gonorrhea and chlamydia. This is an increase of 1,296 tests, a 33% increase from 2015 as compared with 2016.

The positivity rate for chlamydia for all testing done at UHS in the 12 months of 2015 was 4%, in 2016 it was 5%. The positivity rate for chlamydia for patients who attended to clinics during the period of evaluation was 5.1%. The positivity rate for gonorrhea for testing done at UHS in 2015 was 0.6%, the positivity rate for 2016 was 0.7%. The gonorrhea positivity rate for the clinics was 1%. The data show a consistently increasing trend.

Discussion

One of the primary objectives of the clinics was to reach students at high-risk for acquiring STIs as evidenced by a high proportion of attendees with risk factors. The surveys had a high rate of return with 74% of the clinic's attendees completing them, indicating the data obtained is representative of the population of interest. According to the CDC, young adults at highest risk for STIs are young men who have sex with men (YMSM), women, minority groups and persons with multiple partners, inconsistent or no use of barrier devices (CDC, 2015).

Blacks/African American representation was 10% in the clinics, which was higher than the baseline for the matriculated student body of 4% at the university. The data from the program evaluation survey indicated that 52% of the attendees of the STI screening clinics had 4 or more sexual partners in the past 12 months. In the National College Health Assessment II (NCHA) survey from 2016, only 9.4% of college students indicated that they had 4 or more sexual partners in the past 12 months. Additionally, 77% of respondents sometimes or never used barrier devices with vaginal sex, and 64% sometimes or never used barrier devices with anal sex.

Survey participants' sexual behavior indicated that 25% of the men engaged in same sex activity and 9% in sex with opposite and same sex partner's activity, an overall 34% having engaged in same sex behavior. In comparing this data with national estimates on sexual behavior in young adults, a 2011-2013 National Survey of Family Growth found that in adults aged 18-24, 6.2% of men engaged in same sex activity (this includes homosexual and bisexual) and 17.2% of women have engaged in same sex activity (Copen, Chandra, & Febo-Vasquez, 2016).

Another objective was to determine which communication methods reached the most participants. Posters and the UHS website were the most frequently cited sources of information about the screening clinics. Word of mouth was the next most cited source of information regarding the clinics, followed by email, social media, and digital display boards. In advertising the clinics, the only email sent was through the Stonewall Center to their subscribers, those who identify in some way with the LGBT center. Social media was just beginning to be used by UHS to advertise its activities but did not have many followers at the time of the evaluation.

The objective for a 10% decrease in the positivity rates for chlamydia and gonorrhea was adopted from the Healthy Campus 2020 objectives, which were developed in 2010 (ACHA, 2010). The positivity rate from 2016 was 5.0% and from the clinics was 5.1% which is a 25% increase compared with 2015 of 4%. Since 2010, national and state trends for STIs have been steadily increasing; the 2015 national data showed the highest rates of STIs in young adults ever recorded according to the CDC (CDC, 2016). A 25% increase in positivity may reflect the national trends as well as reflect an increase in screening of high-risk patients as well. This goal may have been an unrealistic short-term objective.

Increasing the number of HIV and STI screening tests conducted by UHS was the final objective. UHS increased HIV screening by 24% and chlamydia and gonorrhea by 33%. This

objective was met, 2016 was the first full year of nurse-led HIV screening clinics, and future growth is unlikely to be as high. During the study period there was one case of HIV diagnosed at the UHS Walk-in-Care clinic, rather than at a screening clinic.

Patient confidentiality was found to be a significant concern noted by at least 20% of the participants of the survey. This concern does not reflect the number of potential at-risk students who do not come to the STI screening clinics or the health center to get screened because they have privacy concerns which prevents them from seeking any care whatsoever. In the 2013-2015 National Survey of Family Growth, an estimated 12.7% of adolescents and young adults would not seek sexual and reproductive healthcare due to confidentiality concerns (Leichliter, Copen, & Dittus, 2017). In the clinics, all patients were asked to complete registration forms which include their health insurance information, written and verbal instructions are provided regarding the billing of insurance and their rights to pay by other means to protect their privacy, nevertheless, insurance billing remains a concern or barrier to at-risk students. While 80% of students are not concerned if their parents are aware of their STI screening, it is clear that more needs to be done to address confidentiality.

Overall patients and staff indicated satisfaction with the provision, quality, and convenience of care at the clinics. Staff expressed a need for adequate provision of breaks, which have been limited due to the overwhelming volume of patients seen in such a short time. Typically 60-90 patients are seen by a staff of six to eight people; including reception, nursing and a laboratory technician in a three or four-hour clinic period. Another suggested improvement is to have the assistance of health educators at the clinics, who could do patient assessments and educational interventions to enhance the clinics and ease the staffing shortage.

Conclusion

The nurse-led STI screening clinics program evaluation found that the clinics met most of their objectives yet also have room for improvement. Their services have been widely accepted by the students with attendance at a maximum for current resources and a demonstrated increase of 33% in STI testing and 24% increase in HIV screening conducted by UHS. Currently, there is little room for further growth in services without additional staffing. Increased staffing is needed to ensure continued staff satisfaction at the level of services presently offered.

The clinics appear to have met their objective in reaching students at highest risk for STI acquisition as evidenced by the large proportion of YMSM, Blacks, and students with multiple sex partners, and those who inconsistently use barrier protection. Reaching these at risk students through the website and posters should continue while expanding the social media presence in efforts to target those at highest risk through Twitter, Facebook, and dating applications such as Tinder and Grindr should be explored and expanded.

Given the nationwide trends of increasing rates of STIs and HIV in young adults, the objective of decreasing positivity rates as a short-term objective may be unrealistic. It does remain a long-term goal of the clinics and this metric should be measured and followed continuously. Additionally, more measures than testing and treating are needed to address this trend. The nurse-led clinics should be expanded to include a more robust risk reduction health education program.

Patient confidentiality was found to be a concern of the attendees. This appears to be an emerging issue with the expansion of young adults on parents health insurance through age 26 without clear mechanisms to ensure privacy of services rendered on billing and explanations of

benefits notifications (Leichliter et al., 2017). Ideally this issue should be addressed at the state level in the form of legislation to ensure adult dependents on subscribers insurance are able to have their privacy protected. UHS has room to improve in their process to describe these complexities with their patients through the website, handouts, and staff talking points. Furthermore, a system to encourage and support students who do not seek care because of privacy concerns needs to be designed and initiated. A UHS quality improvement project has been proposed for 2017 to address confidentiality issues as identified by this project evaluation.

There were limitations in this program evaluation study to be taken into consideration. The survey questions could be refined to better target the objectives by directly asking if the participants engaged in same sex, opposite sex or bisexual sexual activity. An assessment question regarding barrier use during oral sex should be included in future evaluations. Inquiring into the broader campus population to ascertain whom the clinics do not reach and why, could illuminate broader issues with the STI clinics such as missed messaging opportunities, deeper privacy or quality concerns.

Disseminating the results of this evaluation to the local stakeholders on the University campus has been in progress since the late fall of 2016 at clinician clinical care meetings and with the health educators. An update with the final results will be held in early summer 2017 for all key stakeholders. Further dissemination with other college health professionals occurred in November 2016 at the New England College Health Association Annual meeting.

In viewing the program evaluation through the lens of the ecological model, the interplay of individual choices, interpersonal, institutional, and community factors, and public policy gain clarity. The complexity involved in developing an effective program that seeks to ameliorate the

increasing burden of STI and HIV infections in young adults through nurse-led clinics must address this interplay between individual choices and influencing factors.

The choice to get screened for HIV and STIs is influenced by factors such as an awareness that these clinics exist, a perception of risk of acquiring the infections, ease of access, welcoming atmosphere, affordability, and an assurance for personal privacy. The program evaluation demonstrates that the clinics do account for most of these factors except for personal privacy. The effect of insurance billing practices upon individual behavior demonstrates the interplay of institutional and public policy upon a public health epidemic. The program evaluation did not measure the degree of this effect; it is not known how many at-risk students are not getting screened due to privacy concerns.

Young adults suffer disproportionately from STIs and HIV, yet many, especially the most vulnerable, are not getting themselves tested despite engaging in high-risk sexual activity (Eastman-Mueller et al., 2015; Llewellyn et al., 2013). Rates of STIs are on the rise while the provision of STI specific clinics and services are declining (CDC, 2016). Addressing the sexual health needs of students on a university campus requires coordinated, collaborative planning, implementation and evaluation to ensure it is comprehensive, evidenced-based and sustainable. STI and HIV screening is an integral part of student's sexual health and, as such, needs to be expanded to meet the burden of disease and the lack of easily accessible opportunities. Nurse led, off-site screening clinics offer a feasible and sustainable option for many more students to get tested quickly, accurately, and competently.

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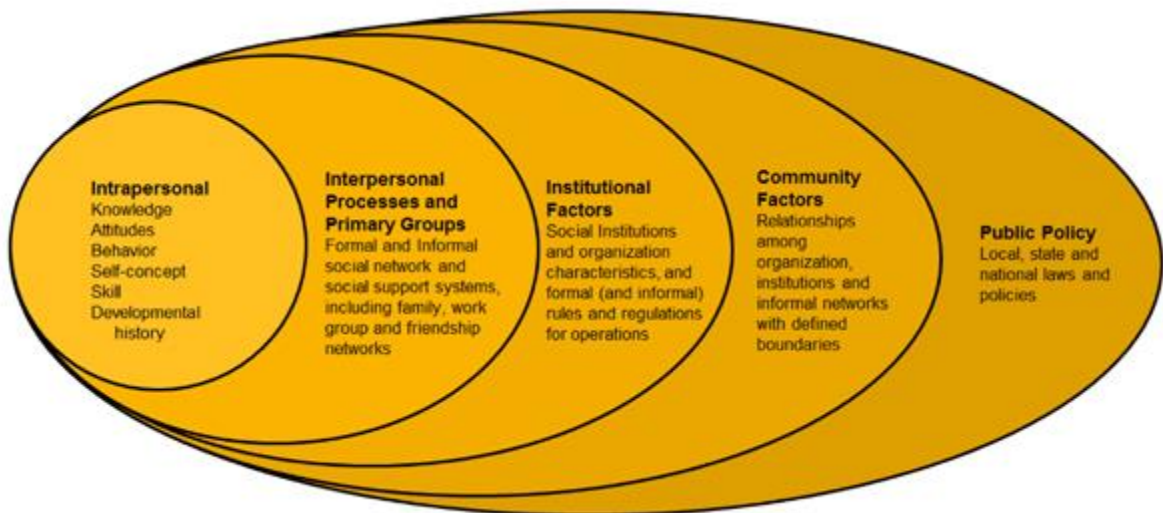
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Appendix A

Diagram of Ecological Model



Adapted from McLeroy, K. R., Steckler, A. and Bibeau, D. (Eds.) (1988). The social ecology of health promotion interventions. *Health Education Quarterly*, 15(4):351-377. Retrieved May 1, 2012, from http://tamhsc.academia.edu/KennethMcLeroy/Papers/81901/An_Ecological_Perspective_on_Health_Promotion_Programs.

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Appendix B

Anonymous STI Clinic Participant Survey: This survey is voluntary and will be used to evaluate the effectiveness of these clinics in reaching students at risk for STI's. Do not put any identifying information on this survey (name, date of birth, phone number). The results of this survey will be used as to guide clinic planning and outreach methods.

1. Age _____

2. Race _____

3. Preferred Gender _____

4. Year in School: 1st 2nd 3rd 4th

Undergraduate Graduate

5. Residence: On-Campus Off-Campus

6. How did you hear of this STI clinic? Check all that apply:

Poster on campus Student Newsletter Twitter /Facebook

Digital Display Board Email from Stonewall center Other _____

UHS Website Word of Mouth

7. Do you have sex with: men women both?

8. How many partners have you had in the past 12 months? _____

9. In the past 30 days have you used barrier devices when engaging in vaginal sex (i.e. condoms, dental dams) always sometimes never

10. In the past 30 days have you used barrier devices when engaging in anal sex (i.e. condoms, dental dams) always sometimes never

11. In the past 30 days have you engaged: Vaginal sex Oral sex Anal/rectal sex

12. Are you more likely to get STI testing done at a walk-in clinic or at a scheduled appointment?

13. Do you have any concerns about the billing or confidentiality of today's visit?

14. Were you satisfied with the care you received? _____

15. Any other feedback about your experience at today's visit is welcome!

Appendix C



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Human Research Protection Office
Research Affairs

MEMORANDUM

To: Ann Becker, College of Nursing
From: Human Research Protection Office
Date: August 18, 2016

Project Title: Sexually Transmitted Infections and HIV Screening Policies and Practices on a University Campus

IRB Number: 16-90

The Human Research Protection Office (HRPO) has evaluated the above named project and has made the following determination:

- The activity does not involve research that obtains information about living individuals and therefore does NOT require IRB review and approval.
- The activity does not involve intervention or interaction with individuals OR does not use identifiable private information and therefore does NOT require IRB review and approval.
- The activity is not considered research under the human subject regulations (Research is defined as "a systematic investigation designed to develop or contribute to generalizable knowledge.") and therefore does NOT require IRB review and approval.
- The activity is determined to meet the definition of human subject research under federal regulations and therefore DOES require submission of applicable materials for IRB review.

For activities requiring review, please see our web pages for more on [types of review](#) or [submitting a new protocol](#). For assistance do not hesitate to contact the Human Research Protection Office at 545-3428 for assistance.