

Chlamydia Knowledge and Testing Behaviors in University Undergraduate Students

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Introduction

Though university students fall into one of the most at-risk groups for chlamydia, the most commonly reported bacterial sexually transmitted infection in the U.S., many are not being tested for this infection. A lack of chlamydia knowledge among this population is well-established in the evidence and likely contributes to decreased testing.

Background & Significance

- *Chlamydia trachomatis* is the bacterial organism responsible for the most commonly reported sexually transmitted infection (STI) in the United States.¹
- Over 1.7 million cases of chlamydia were reported to the Centers for Disease Control and Prevention (CDC) in 2017, though it is estimated that only about half of all cases are actually reported.⁵
- In recent years, the District of Columbia has consistently had the highest rates of chlamydia nationwide, with 1,337 cases per 100,000 population in 2017.⁶
- Chlamydia evaluation and treatment in the United States was responsible for an estimated \$516.7 million in 2008, making it the most costly non-viral STI.⁷
- The highest rates of chlamydial infection are among individuals aged 15-24 years, a population that includes college and university students.¹
- Chlamydia can have potentially devastating consequences if left untreated, including pelvic inflammatory disease, ectopic pregnancy, chronic pelvic pain, infertility and an increased risk of HIV transmission if a person is exposed to the virus.^{1,3}
- Lack of chlamydia knowledge among the university student age population is well-established in the literature and likely contributes to decreased test-seeking behavior in this population.⁹⁻²⁰
- Interventions targeted specifically for this barrier in university students are needed^{13-16,21,23,26-30}
- No formal, standardized effective intervention or method to increase chlamydia knowledge among U.S. university students was identified in our literature search
- There is a need for U.S. university health providers to identify gaps in chlamydia knowledge among the undergraduate students at their respective institutions, and then tailor and implement evidenced-based interventions specifically for those populations.

Purpose & Aims

The pilot study aimed to increase chlamydia knowledge and reported chlamydia test-seeking behavior among university undergraduate students using an evidence-based, online educational program tailored specifically for this population.

Aim 1

Increase chlamydia knowledge among university undergraduate students over a 2-month period

Aim 2

Increase reported hypothetical chlamydia test-seeking behavior over a 2-month period

Aim 3

Evaluate student experiences with chlamydia knowledge and testing

Intervention

Focus Group

- Explored and evaluated upperclassmen chlamydia knowledge, chlamydia testing behaviors & learning needs/preferences
- Information gathered informed and was incorporated into an evidence-based educational program later delivered to university undergraduate students

Educational Program

- Created by the investigators
- Based on evidence from the CDC, the National Chlamydia Coalition, information gathered in the focus group & the literature search
- Targeted chlamydia knowledge gaps identified in the focus group & literature search
- Pre-test, web-based educational program, immediate post-test all delivered seamlessly online through Qualtrics© and accessed anonymously through hyperlink or QR code

Characteristic	Pre-Program Participants (n=44)	Immediate Post-Program Participants (n=34)	2-Month Post-Program Participants (n=8)
Sex assigned at birth, % (n)			
Female	75.0% (33)	82.4% (28)	75.0% (6)
Male	25.0% (11)	17.6% (6)	25.0% (2)
Current gender identity, % (n)			
Female	72.7% (32)	82.4% (28)	75.0% (6)
Male	22.7% (10)	14.7% (5)	25.0% (2)
Non-binary/third gender	2.3% (1)	N/A	N/A
Prefer not to say	2.3% (1)	2.9% (1)	N/A
Age, years, mean (SD)	20.2 (1.4)	20.4 (1.4)	20.1 (0.6)
Grade level, % (n)			
Freshman	9.1% (4)	5.9% (2)	N/A
Sophomore	27.3% (12)	23.5% (8)	62.5% (5)
Junior	27.3% (12)	32.4% (11)	12.5% (1)
Senior	36.4% (16)	38.2% (13)	25.0% (2)

Design

Exploratory, sequential, mixed-methods design with a pre- and post-test

Setting

One mid-size, private, co-educational university in the mid-Atlantic United States

Participants

University undergraduate students >18 years of age

Exclusion Criteria

Graduate students and students < 18 years of age

Knowledge Item Answered Correctly	Pre-Program Assessment (n=44)	Immediate-Post Program Assessment (n=34)	P-value (test performed)
Mean number of Chlamydia knowledge items out of 8 correct, mean (SD)	6.34 (1.67)	8.00 (.00)	<.0001* (paired t-test)
Chlamydia is the most common bacterial STI in the U.S., % (n)	54.5% (24)	100.0% (34)	<.0001* (McNemar's)
Individuals 15-24 years are at a high risk for chlamydia, % (n)	93.2% (41)	100.0% (34)	.500 (McNemar's)
Women with chlamydia do not always have symptoms, % (n)	88.6% (39)	100.0% (34)	.500 (McNemar's)
It is easy to test for chlamydia, % (n)	77.3% (34)	100.0% (34)	.008* (McNemar's)
Chlamydia can be passed through vaginal, oral and anal sex, % (n)	95.5% (42)	100.0% (34)	1.000 (McNemar's)
Men with chlamydia do not always have symptoms, % (n)	75.0% (33)	100.0% (34)	.008* (McNemar's)
Chlamydia can cause long-term health problems, % (n)	75.0% (33)	100.0% (34)	.016* (McNemar's)
It is easy to treat chlamydia, % (n)	75.0% (33)	100.0% (34)	.008* (McNemar's)

Note: STI, sexually transmitted infection; SD = standard deviation; *p < .05

Results

Focus Group

- Need for chlamydia education at all undergraduate grade levels
- General lack of chlamydia knowledge among the target population
- Student participation in the intervention would be higher if program is offered online rather than in-person

Focus group data informed and guided intervention development

Educational Program

- Significant increase in chlamydia knowledge after the educational program
- No significant change in knowledge over a 2-month period after completing the intervention
- Non-significant increase in proportion of students who would seek chlamydia testing after the intervention

Limitations

- Small sample size; unpowered
- Recruitment constraints
- Potential bias
- Evaluating hypothetical rather than actual test-seeking behavior
- No other potential barriers to chlamydia testing were evaluated

Discussion & Conclusions

- The intervention in this pilot study can increase chlamydia knowledge among university undergraduate students
- Chlamydia knowledge gained through the intervention was retained over time
- Increased chlamydia knowledge did not result in increased reported test-seeking behavior in the study sample
- The intervention in this study is feasible in a university setting, and demonstrates the importance of tailoring a chlamydia educational program specifically for university undergraduate students
- Expanded study of the intervention at the target institution and other universities is needed to evaluate intervention effectiveness on a larger scale
- Exploring participant experiences with chlamydia knowledge and testing in this study allowed for deeper understanding of results and identification of future research areas
- Further study is needed to evaluate the relationship between increased chlamydia knowledge and actual testing uptake
- Future research should explore other barriers to chlamydia testing among university students

