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Improving Early Detection and Treatment of Chlamydia by Implementing a Routine Chlamydia Screening and Testing in Females Between the Ages of 18–24

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**Improving Early Detection and Treatment of Chlamydia by Implementing a Routine
Chlamydia Screening and Testing in Females Between the Ages of 18–24**

A DNP Project Submitted to the
Graduate Faculty
of Jacksonville State University
in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Nursing Practice

By

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Jacksonville, Alabama

August 2, 2024

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August 2, 2024

Abstract

Background: Chlamydia Trachomatis is the most frequently reported bacterial sexually transmitted infection in the United States. One in 20 sexually active females between the ages of 15 and 24 have chlamydia. Most people with the infection are asymptomatic and do not seek treatment. Chlamydial infections in women, especially if untreated, increase the risk of infertility and ectopic pregnancy, leading to higher medical costs.

Purpose: The project aimed to implement early screening for chlamydial infections in the young adult population to increase early detection of the disease.

Methods: A pre-post design was used for this project to compare chlamydia diagnosis rates pre- and post-intervention. All females between the ages of 18 and 24 who presented to the clinic completed the chlamydia screening questionnaire regardless of their presenting symptoms. The questionnaire determined eligibility for chlamydia testing.

Results: Screening rates increased from 61.5% before implementation to 89.1% after implementation. The rate of early detection of chlamydia increased from 0% to 19.4%.

Conclusion: An increase in screening rates can help prevent the spread of the infection to sexual partners and reduce the risk of complications such as pelvic inflammatory disease (PID) and infertility.

Keywords: chlamydia, chlamydia screening, early detection, chlamydia treatment

Acknowledgments

This project was guided by Dr. Megan Moore, the DNP project Chair, and Dr. Tonya Jefferson, the DNP project preceptor.

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Improving Early Detection and Treatment of Chlamydia by Implementing a Routine Chlamydia Screening and Testing in Females Between the Ages of 18–24

Chlamydia, caused by *Chlamydia trachomatis* (CT), stands as the most prevalent bacterial sexually transmitted infection (STI) in the United States (Centers for Disease Control and Prevention [CDC], 2024a). Most cases remain undiagnosed due to the absence of symptoms, particularly in youths between ages 15–24. Estimates reveal that approximately one in 20 sexually active young women within this age bracket contract chlamydia (CDC, 2024a). Chlamydial infection primarily affects the cervix in females resulting in cervicitis, urethritis, pelvic inflammatory disease (PID), perihepatitis, or proctitis.

STIs pose significant threats to both physical and emotional well-being, with women often experiencing more enduring effects. Early screening aims to detect and treat infections to prevent complications and transmission to sexual partners (Ghanem & Tuddenham, 2024). If left untreated, STIs can result in severe outcomes such as neurological and cardiovascular diseases. Moreover, STIs carry a social stigma, contribute to domestic violence, and negatively impact the overall quality of life (World Health Organization, 2023). To address these concerns, the U.S. Preventive Services Task Force (USPSTF) recommends annual chlamydia and gonorrhea screening for all sexually active women under 25 years old (2021).

Background

The CDC reported a total of 1,649,716 cases of CT in 2022, making it the most common nationally notifiable STI in the United States. 57.7% of reported cases were among persons between the ages 15–24 (CDC, 2024a). Georgia ranked 5th in the nation for CT infection rates, reporting 72,662 new chlamydia cases in 2022 (CDC, 2024b). Chlamydia is a curable disease. Treatment will cure the person's chlamydia infection, but treatment will not repair the damage

previously caused by the disease. The project's clinic is in a low-income community in a large metropolitan city in the Southeastern United States. Approximately 80% of patients seen at the clinic do not routinely seek the care of a primary care provider. The clinic staff sees approximately 30–40 patients a week between the ages of 15–24 for genitourinary symptoms.

Problem Identification

The project's clinic lacks routine chlamydia screening of asymptomatic patients, relying solely on symptomatic presentations for testing. This approach leads to missed opportunities for early detection and treatment counter to the USPSTF recommendations. Regardless of presenting symptoms, routine chlamydia screening for all females age 18-24 could significantly enhance early detection and treatment rates. This proactive approach could prevent long-term complications, reduce disease burden, and curb infection transmission in the community. In 2018, the direct medical cost and productivity loss per diagnosed chlamydia case were \$151 and \$206 respectively (Kumar et al., 2021).

Problem Statement and PICOT Question

Currently, the project's clinic sees a significant number of patients at risk for chlamydial infections but lacks a protocol that incorporates the USPSTF screening recommendations for chlamydial infections. This resulted in the following PICOT question: In females between the ages of 18 and 24, would implementing a routine screening and testing protocol, compared to no routine screening and testing, increase the rates of early detection and treatment of chlamydial infection over six weeks?

Review of Literature

In the pursuit of establishing optimal strategies for enhancing the early identification and management of chlamydia, this author conducted a review of the CINAHL database using

keywords like "chlamydia," "screening," "testing," and "treatment." The search yielded 20 diverse studies focusing on various aspects of chlamydia screening and testing. Through this review, the author extracted vital themes, including the advantages of chlamydia risk assessment, testing and treatment, and the impacts of chlamydia on females.

Benefits of Chlamydia Risk Screening

The literature on chlamydia screening highlights its significant benefits. Gautam and Orrino (2023) demonstrated that targeted screening of high-risk service members improved the detection of asymptomatic carriers and reduced chlamydia incidence among young adults. Similarly, Rönn et al. (2023) found that chlamydia screening and partner notification in the United States from 2000 to 2015 prevented an estimated 1.3 million cases of PID. These studies collectively emphasize that chlamydia screening not only enhances early detection and treatment, but also provides long-term health benefits.

Chlamydia Testing Methods

The literature on chlamydia testing emphasizes the benefits of various innovative approaches. While Tomcho et al. (2022) suggested that opt-out testing could enhance detection and promote equity, Fisk et al. (2020) demonstrated improved STI treatment appropriateness in urgent care using nucleic acid amplification testing (NAAT) for chlamydia and gonorrhea, advocating for its use in urgent settings to expedite treatment. Additionally, Ogale et al.'s 2019 meta-analysis indicated that self-collection of samples for STI testing could effectively increase testing rates. Collectively, these studies support the implementation of opt-out testing, NAAT, and self-collection methods to improve STI detection.

Effects of Chlamydia on Females

Chlamydia has significant implications for reproductive health, which include PID, infertility, and EP. Sweeney et al. (2022) found that among PID cases caused by STIs, chlamydia was present in a substantial percentage. Anyalechi et al. (2021) and Xia et al. (2020) highlighted a potential link between chlamydial infection, infertility, and increased risk of EP. Overall, these studies reinforce the critical need for addressing and preventing chlamydial infections due to their significant impact on reproductive health.

While these studies might differ on screening intervals, testing, and treatment recommendations, there is a consensus that screening and testing for chlamydia in women is essential for the early identification and treatment of the disease. Early identification and treatment could help prevent chlamydial-associated complications like EPs, PID, and infertility. This data reinforces the need to adhere to chlamydia screening guidelines and to increase screening coverage in those at risk (Gupta et al., 2021).

Theoretical Framework

This Doctor of Nursing (DNP) project aimed to enhance early detection and treatment of chlamydia in women between the ages of 18 and 24, aligned well with John Kotter's Eight-Step Change Model. This framework provided a structured approach to implementing change.

The DNP student initiated open discussions to raise awareness about missed early detection and treatment opportunities. Following Kotter's model (1996), influential change leaders and stakeholders were identified and successfully brought on board. Their support and commitment to the project's goals paved the way for their active participation in implementing broader screening practices.

Following Kotter's model (1996), the DNP student focused on creating a strategic vision for improved chlamydia screening. This vision emphasized core values like adhering to USPSTF guidelines and ensured stakeholder buy-in by addressing concerns. Stakeholder meetings identified financial barriers for patients seeking testing. Fortunately, the local health department's free STI testing kits to the clinic increased accessibility and overcame a significant hurdle in the implementation process.

The project addressed potential roadblocks to the new chlamydia screening practices, aligning with Kotter's model (1996). There was no internal resistance, and stakeholders were enthusiastic about the project's goals. The project adopted Kotter's principle of setting short-term goals to ensure success. One short-term goal was to increase the number of screenings.

The initiative successfully achieved long-term change by emphasizing the need for improved chlamydia screening and celebrating achievements. Short-term goals, like increased screenings, were used to build momentum and commitment toward continuous improvement. They were woven into the organization's structure to solidify the new practices. Consistent communication highlighted the connection between the new behaviors and overall success.

Quality Improvement Methodology

The DNP student used Deming's Plan-Do-Study-Act (PDSA) cycle, often termed the rapid improvement cycle (Butts & Rich, 2018), for the project. The planning phase of the PDSA cycle involved problem identification, cause analysis, stakeholder identification, and setting success criteria (Reed & Card, 2016). Implementation occurred during the *do* phase. In this stage, the DNP student documented issues, noted observations, and conducted data analysis (Reed & Card, 2016). The DNP student executed the annual screening and testing of females under 25 following USPSTF recommendations using a chlamydia screening questionnaire.

After implementing these changes, analyzing, and studying the outcomes was crucial. This phase involved assessing whether the changes from the project led to the desired improvements, gathering data, comparing results against initial goals, and understanding any variations or unexpected outcomes (Butts & Rich, 2018). In this stage, based on the project findings, the DNP student and stakeholders could either implement and sustain the intervention, or end the project without investigating further effects (Reed & Card, 2016).

Project Design

The DNP student received approval from the educational institution's Institutional Review Board (see Appendix A) and completed training on the protection of human subjects (see Appendix B). The clinic administrator provided a letter of support for this project. The DNP student used a chlamydia screening questionnaire to assess patients' risk and perform appropriate testing.

The DNP student conducted an educational session for clinic staff, which included three nurse practitioners and two medical assistants. The session focused on educating them about the long-term impacts of chlamydia on female health, stressing the significance of annual screening and testing for females under 25 based on USPSTF recommendations, and elaborating on the current treatment guidelines by the CDC. The DNP student utilized slide presentations and distributed handouts to facilitate the educational process. Attendance incentives included refreshments and snacks for the staff.

The patient population served by the clinic was primarily from a low-income area. The inclusion criteria for this project encompassed sexually active females between the ages of 18 to 24 who had not undergone chlamydia testing within the past year. Females under 18 years old fell under the exclusion criteria for participation in this study. The project implementation period

was six weeks. Patients with insurance and associated symptoms were billed accordingly for testing. The project used free STI testing kits from the local Health Department for those without genitourinary symptoms but meeting the testing criteria.

All eligible female patients, regardless of symptoms, were screened using a chlamydia questionnaire. Insurance was billed for symptomatic patients using ICD-10 code Z11.3. The DNP student used CPT code 87491 for all testing. Using one CPT code simplified chart audits and data collection. The collected data was de-identified and securely stored in a password-encrypted electronic shared drive. The DNP student used the CPT code 87491 (Current Procedural Terminology code for infectious agent detection by nucleic acid for CT) to retrieve data for analysis. Using Fisher's exact tests, the DNP student compared the number of positive chlamydia tests before and after implementation.

Project Results and Evaluation

Data were imported into and analyzed using SPSS version 23 for Windows (IBM Corp., Armonk, NY). Frequency tables summarize the demographics of the patients and the screening/testing data. Fisher's exact tests were used to determine if there was a relationship between patients' screening rates and the implementation of routine screening and testing. A *p*-value less than 0.05 indicated statistical significance.

One hundred and forty-two patients (61.5%) were screened prior to implementation; after the implementation of routine screening and testing, 171 patients (89.1%) were screened. According to the results of Fisher's exact test, $p < 0.001$, which indicates that the screening rate after the implementation of routine screening and testing was statistically significant. The screening rates of asymptomatic patients increased from 0% to 39.2%.

Early detection rate of chlamydial infection for this project was the number of asymptomatic patients divided by the number of asymptomatic patients screened and multiplied by 100 percent. The rate of early detection of Chlamydial infection after the implementation of routine screening was 19.4% ($= (13/67) * 100\%$). The rate of early detection of chlamydial infection before the implementation of routine screening was not available as no asymptomatic patients were screened.

Conclusion

Increased chlamydia screening plays a vital role in early detection and treatment. Early screening aims to detect and treat infections to prevent complications and spread (Ghanem & Tuddenham, 2024). Since the infection often presents without symptoms, especially in women, broader screening helps identify asymptomatic cases that might otherwise go unnoticed. Untreated chlamydial infections in women heighten the risk of infertility and ectopic pregnancy (EP), which may lead to substantial medical expenses (Mohseni et al., 2019). Early diagnosis and treatment prevent complications like pelvic inflammatory disease and infertility while also reducing transmission to sexual partners.

During implementation and data analysis, two limitations of the project occurred. The first limitation was the implementation timeframe of six weeks. Short timeframes may limit the amount of data that can be collected or analyzed, reducing the ability to accurately evaluate the impact of interventions and identify areas for further improvement. The second limitation was the lack of pre-implementation data for chlamydia screening in asymptomatic patients. This limitation created a barrier in comparing early detection rates pre- and post-implementation.

Sustaining chlamydia screening success requires ongoing education for healthcare providers. Education should include updated testing and treatment guidelines alongside cultural

competency training. Furthermore, integrating chlamydia screening into routine healthcare visits and offering testing in diverse settings like clinics, schools, and community centers can all increase detection rates. Collaborations with community organizations and public health agencies can bridge the gap for those lacking financial resources for screening and treatment. This multi-faceted approach ensures continued progress toward early detection and improved public health outcomes.

Dissemination of project results occurred within the project's clinic to all stakeholders during July 2024 following the project's completion. In July 2024 the project was also disseminated at the educational institution's DNP Symposium event.

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Appendix A

JSU IRB Approval Letter



Institutional Review Board for the Protection of Human Subjects in Research

203 Angle Hall
700 Pelham Road North
Jacksonville, AL 36265-1602

November 14, 2023

Isabelle Nuh
Jacksonville State University
Jacksonville, AL 36265

Dear Isabelle:

Your protocol for the project titled "Improving Early Detection and Treatment of Chlamydia by Implementing a Routine Chlamydia Screening and Testing in Females Between the Ages of 18-24 " protocol number 11142023-03, has been approved by the JSU Institutional Review Board for the Protection of Human Subjects in Research (IRB).

If your research deviates from that listed in the protocol, please notify me immediately. One year from the date of this approval letter, please send me a progress report of your research project.



Best wishes for a successful research project.

Sincerely,

A handwritten signature in black ink, appearing to read 'Sarah Donley'.

Sarah Donley
Human Protections Administrator, Institutional Review Board

Appendix B CITI Training



Completion Date 30-Jul-2023
Expiration Date 30-Jul-2026
Record ID 57239992

This is to certify that:

Isabelle Nuh


Has completed the following CITI Program course:

Social and Behavioral Responsible Conduct of Research
(Curriculum Group)
Social and Behavioral Responsible Conduct of Research
(Course Learner Group)
1 - RCR
(Stage)

Under requirements set by:

Jacksonville State University

Not valid for renewal of certification through CME.



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