



DNP Manuscript Defense Approval

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Date: * 06/28/2022

- Choose your DNP program: *
- Adult-Gerontology Acute Care Nurse Practitioner (Doctor of Nursing Practice)
 - Family Nurse Practitioner (Doctor of Nursing Practice)
 - Post-Master's DNP (Doctor of Nursing Practice)

Manuscript Title: * Implementation and Evaluat

Date of Manuscript Approval: * 06/28/2022

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**Implementation and Evaluation of a Syphilis Screening Tool to Increase Patient Testing for
Syphilis Among Adults 18 Years and Older in a Rural Primary Care Clinic**

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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August 5, 2022

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August 5, 2022

Abstract

Background: Sexually transmitted infections (STIs) are an increasing epidemic in the United States (U.S.) that need immediate interventions to reverse the effects of syphilis on the sexual health of adults in rural populations. Many are unaware of the growing rate of syphilis and the overall impact it causes nationally. When syphilis is detected early, it can be easily treated and cured. Rural primary care providers are ideal candidates for implementing education, screening, testing, and treatment.

Purpose: The Doctor of Nursing Practice (DNP) project aims to increase the frequency of screening patients in rural primary care clinics for high-risk sexual behaviors. Those identified as high-risk for contracting syphilis will receive education, a recommendation for testing, and treatment. This effort hopes to increase awareness, stop spreading, and improve patient outcomes.

Methods: This quality improvement project provides rural primary care providers with a syphilis screening tool for adults 18 years or older at high risk for STIs. The screening tool is a questionnaire patient complete while waiting to see the provider. This method allowed patients to communicate with the provider without unwarranted discussion and anonymity.

Results: After the provider modified his routine assessment and incorporated the syphilis screening tool, results showed a p-value of 0.00035, which was statistically significant. Despite some restrictions and barriers, the provider and patients better-understood syphilis and other STIs' dangers.

Conclusion: This project helped identify the need for STI education, testing, and treatment in rural primary care clinics. Implementing a syphilis screening tool was the first building block toward creating awareness and testing patients who may have risky sexual behaviors.

Keywords: syphilis, screening, adults, rural, primary care providers, United States, STIs.

Acknowledgments

Only God could have been in control of me completing this challenging endeavor. For everything, I give him all the praise. I commend my JSU chair and preceptor for their patience and guidance. Your support and knowledge were unmeasurable and deeply appreciated.

In memory of my father, Howard, my grandfather Carl, my two brothers, Joe and Donald, and my second mom, Evon, who all believed in me, I lost them along my nursing journey. I will keep the candle burning and hope we meet again in heaven. For my sisters, Nikki, Gail, their children, and other family and friends who supported me, the sky is the limit, so do not settle for less.

My mom, Louise, started on the road toward nursing many years ago but was detoured due to family obligations. I dedicate my degree to her.

Last but certainly not least, I applaud my husband and best friend, Leigh. His love, protection, and inspiration have kept me moving forward no matter what obstacles tried to interrupt my path or dim my light.

Thanks, everyone. I love all of you.

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Introduction

STIs are a significant public health concern in the United States and can include chlamydia, gonorrhea, and syphilis (American Academy of Family Physicians [AAFP], 2019). The cause of syphilis is a bacterium called *Treponema pallidum* that is solely sexually transmitted commonly through vaginal, oral, or anal sexual contact from one person to another. Syphilis could originate from bacteria, viruses, and parasites and be known as 'The Great Pretender,' as its symptoms can look like many infections (Medline Plus, 2017). New data from the Centers for Disease Control and Prevention (CDC) showed that reported annual STIs in the United States (U.S.) continued to climb in 2019, reaching an all-time high for the sixth consecutive year. Syphilis is a progressive infection that, if left untreated, can cause serious health complications in the brain, heart, and unborn babies; therefore, it warrants immediate intervention (Centers for Disease Control and Prevention [CDC], 2021g). The following background section elaborated more on syphilis and its effect on the body.

The DNP project addressed the rise of under-diagnosed syphilis rates and how to capture those requiring education and treatment within a rural community family practice. Primary care providers in rural clinics are ideal for educating patients about screening for STIs, ordering necessary testing, and providing adequate treatment to decrease the rate of syphilis and other STIs. However, providers are reluctant to assess all patients for STIs and tend to ask more women than men about risky sexual encounters (Pinto et al., 2019). Men who have sex with men, black men, and individuals in rural communities are the highest risk population and are more likely to get infected and spread syphilis to others (CDC, 2021g; Weber, 2019; Wheeler, 2021). Identifying high-risk patients shows promise in lowering the rate of infections and decreasing the spread to others (Hunter et al., 2014). This project also addressed the lack of syphilis screening, education,

testing, and guidelines within rural primary care clinics. Utilizing primary care providers to implement the syphilis screening tool provided an opportunity to identify patients with risky sexual behaviors during their scheduled appointment. It was the first step toward incorporating sustainable guidelines, which allowed communication with patients regarding improved sexual health outcomes in the community. The U.S. Preventive Services Task Force (USPSTF) recommended with high certainty that the net benefit of screening for syphilis infection in nonpregnant persons who were at increased risk for infection was substantial (U.S. Preventive Services Task Force [USPSTF], 2016).

Background

The origin of syphilis remains unknown; however, many speculate where it first appeared. Since syphilis was labeled disgraceful and immoral in its outbreak, each country whose population was affected by the infection blamed the neighboring countries for spreading it to one another. Columbian and pre-Columbian are its two primary hypotheses: one proposes that his crew carried syphilis to Europe from America. The second presents that it existed in Europe before the new world, pre-Columbus. However, the first recorded outbreak of Syphilis in Europe occurred in Naples, Italy, around 1494-1495. This outbreak claimed to spread from returning French troops during a French invasion, making the infection known as 'French disease.' On the other hand, the French preferred to call it the 'Neapolitan disease,' blaming it on the city of Naples. *Treponema pallidum* genome in 1998 paved the way for new insight into the origins of syphilis, and recent phylogenetic data support that the Columbus journey triggered the emergence of syphilis throughout Europe (Farhi and Dupin, 2010; Peterman and Kidd, 2019).

Girolamo Fracastoro, an Italian physician and poet, first applied the term 'syphilis' in 1530 after a poem called *syphilis*, a character name describing a shepherd, Syphilus, horrific experience

after he contracted the infection (Tampa et al., 2014). John Parascandola wrote a book titled *Sex, Sin, and Science: A History of Syphilis in America*, where he described syphilis as being so sinful that he could not refer to it by its name (Peterman, 2009). Because of its labeled history as 'sin, social evil, prostitution, social disease, and immoral,' efforts were geared toward developing a 'social hygiene' movement to abolish syphilis. Parascandola describes the move as more interested in preventing sex than preventing, treating, and spreading the infection. He believed the social behavior toward syphilis was so widespread that it affected all individuals, not just a specific group (Peterman, 2009). Historic social hygiene movements serve as a basis for some of the same sexual health education efforts in the U.S. today. The highest rate of syphilis is among men who have sex with men (MSM), black men, and in rural communities starting as early as fifteen years old (CDC, 2021g; Weber, 2019; Wheeler, 2021). Yet, current state laws and clinicians refrain from discussing or addressing sexual health in rural practices, schools, and local communities.

The CDC reported 1.9 million new STI cases in 2014, and cases rose to 2.6 million in 2019, an increase of 74% over five years. New STIs have an annual direct cost of nearly \$16 billion in the U.S. (CDC, 2021c). From 2013 to 2016, the Mississippi Department of Health (MSDH) reported that new syphilis cases almost tripled. Nationally, the U.S. was seeing its highest rate of syphilis in twenty years (Mississippi State Department of Health [MSDH], 2019). According to reports from the CDC (2021b), the U.S. had a 30% increase in syphilis in 2018 and 2019. Approximately 15% of infected persons progress to the late stage when left undetected and untreated. Tracking and controlling the spread of syphilis and other STIs mandates the providers in most states to document and report syphilis (including congenital syphilis), gonorrhea, chlamydia, chancroid, and HIV to their state department of health (CDC, 2021e).

Health Risks

Although syphilis has been around for centuries and was nearly eradicated in the late 1900s, syphilis continues to plague the U.S. It remains a significant health risk (CDC, 2021d). Syphilis has four stages which range from early-stage manifestations and progress to late-stage over a significant amount of time. Early-stage symptoms can occur within the first year following the initial infection. Late-stage symptoms can occur more than one year after the last active illness. Primary and secondary stages are found early in the disease process and are considered the most infectious stages in a progressive sequence. In the contagious primary stage, syphilis can present as small painless chancre sores that may go unnoticed in the vagina or rectum. Symptoms can remain inactive and undetected for decades into the latent stage, leading to significant morbidities if left untreated (AAFP, 2019). The secondary stage of syphilis often presents as rashes that can cover the palms and soles, hair loss, muscle aches, fever, sore throat, and swollen lymph nodes. Syphilis can also be associated with human immunodeficiency virus (HIV) and problems during pregnancy. Syphilis is synonymous with its effects on the same type of high-risk patients as HIV, and it may enhance the transmission of HIV infection, making coinfection very common (USPSTF, 2016). Patients positive for syphilis should test for HIV, and all HIV-positive patients should be screened for syphilis regularly. Early latent syphilis is asymptomatic but acquired within the last year and is also considered an early stage of syphilis. When not adequately treated, syphilis progresses into latent and tertiary stages and causes damage to the central nervous system, leading to more degenerative disorders such as neurosyphilis. Neurosyphilis can cause irreversible damage to the brain, central nervous system, and spinal cord. Syphilis causes inflammatory lesions throughout the body in the tertiary stage, leading to multi-organ dysfunction, including heart and lungs. Historically, neurosyphilis occurred mainly in the tertiary stage; however, it also presents

symptoms at any stage of infection and results in blindness, paresis, tabes dorsalis (degenerative dorsal column and dorsal root of the spinal cord), and dementia. Although syphilis can be cured if diagnosed and successfully treated in the early stages, individuals can be reinfected if exposed subsequently after treatment (Mayo Clinic, 2021).

Untreated syphilis during pregnancy can infect newborns and lead to deafness, teeth deformities, saddle nose, premature birth, stillborn, or death after delivery (Mayo Clinic, 2021). Congenital syphilis is also a growing public health concern, with estimates showing that syphilis affects one million pregnant women worldwide and causes more than 300,000 fetal and neonatal deaths (CDC, 2021; Rocha et al., 2021). Congenital syphilis may also lead to miscarriages and congenital disabilities that might not be evident until early childhood or adulthood. The best treatment for congenital syphilis is prevention by screening, detecting, and treating the infection in women early in their disease course (Wheeler, 2021).

Health Benefits from Screening

The U.S. Preventive Service Task Force (USPSTF, 2016) reports that screening for syphilis in persons at increased risk effectively stops prolonged infection and permanent damage to the heart, brain, and nervous system. However, standard treatment cannot repair or reverse the damage already occurred; therefore, implementing a syphilis screening tool is imperative to identify high-risk individuals, educate, test, and prevent future infections (Mayo Clinic, 2021). Screening pregnant females could identify syphilis cases that might otherwise be undetected until late in pregnancy. When combined with early treatment, screening could mitigate sexual transmission, potential late-stage sequelae, and vertical transmission from mother to fetus for individuals who become pregnant (California Department of Public Health [CDPH], 2020).

Another advantage of an effective syphilis screening tool was promoting conversation and awareness about sexual health and STIs between primary care providers and patients estranged by stigma and shame for a long time (Amin, 2021). Since patients are hesitant to discuss their sexual health with their primary care providers, syphilis education tools teach individuals the importance of early detection and testing. The opportunity for syphilis screening in primary care settings also represents an important step that may help patients feel that they *'have permission'* and are more comfortable discussing sexual health issues. Sexual health may seem complicated, especially since nearly 90% of gay, bisexual, and other men were reluctant to discuss their sexual orientation with their providers (Grennan & Tan, 2021). Local contact information for the county or state health departments familiarizes patients with other available follow-up care resources.

Current Plans to Increase Education and Testing

Education is always a benefit of screening for infections. Every few years, new syphilis elimination strategies emerge to tackle the increasing rates that continue to plague the U.S.; however, some approaches lack new science, evidence-based practice, and updated knowledge of the health risks of syphilis (Peterman & Furness, 2015). For years, federal and private-sector financial support has mainly been for abstinence-only education in schools and communities; nonetheless, the STI rate continues to increase. Unfortunately, abstinence-only programs provide minimal education about syphilis awareness and prevention, leading to an increased rate of poor sexual health outcomes and naïve' perceptions of those that do not practice abstinence (Donovan, 2017; National Coalition Against Censorship [NCAC], 2021).

Early recognition and education are at the forefront of knowledge and infection prevention; therefore, sexual health assessment tools are ideal for increasing syphilis screening, promoting communication with providers, and testing to stop the spread (Goldfarb and Lieberman, 2021).

Research has shown that screening is the latest, more effective tool in preventing, reducing transmission, and educating patients about syphilis and other STIs (CDC, 2021f). After researching STI statistics in a local community, the primary investigator (P.I.) found that a rural primary care practice had no STI screening guidelines. Therefore, a syphilis screening tool created by Susan Elliot was examined and utilized as a basis for the current screening tool used in this DNP project (Elliott, 2019). The Susan Elliot tool was revised to meet the needs of the community. The new was selected with approval from the site provider to help identify patients with risky sexual behaviors (see Appendix A). Since patients shy away from discussing sexual health, the patient completed the questionnaire in private while waiting to see the provider. This strategy encouraged participation without unnecessary verbal assessment and discussion with staff regarding their sexual health practices. The new screening tool also helped patients with low reading abilities understand the easier-to-read questionnaire.

Providers Delivery of Syphilis Screening Tool

In one effort to detect and treat high-risk patients for syphilis during the mid-1900s, insurance companies, law enforcement agencies, employers, and hospitals completed screenings. Those approaches were not sustainable due to the enormous incurred expenses. Officials failed to factor in the possibility of unnecessarily screening and testing individuals per the USPSTF (2016) recommendations. Peterman and Furness (2015) discussed how the high costs of screening and testing outweigh the goals of better health and encouraged other approaches to be examined, thus leaving many individuals unscreened due to the overall cost associated with screening and testing. Due to budget cuts and limited resources today, many STI clinics are no longer accessible in rural areas where the infection rate remains high. Implementing a syphilis screening tool in primary care

practices can reach all adult patients who are identified as having risky sexual behaviors and would benefit from further evaluations while at already scheduled appointments.

Another provider effort took place through gynecology and obstetrical-care settings that could implement syphilis or other STI screening tools to identify, educate, and test while improving the prevention of congenital syphilis contracted by infected parents. Assessing and testing high-risk patients creates an opportunity to reach sexual partners or other individuals exposed within the community. Although women's health clinics do not directly focus on diagnosing and treating STIs, they can offer screening, testing, and treatments for their patients per CDC guidelines (CDC, 2021f).

Public STI services are unavailable for those living in the rural U.S., and primary care services cannot reach all individuals who need syphilis or other STI screening alone. Therefore, other healthcare specialties such as cardiology, neurology, and dermatology often see patients. Various providers create opportunities to expand syphilis screening throughout multiple healthcare disciplines. Based on the prevalence of infections and comorbidities, syphilis damages major organ systems when not treated or incorrectly treated. Continuing education about syphilis and the ability to perform an adequate sexual health history on patients is a vital component of STI interventions, preventing other health dysfunctions and irreversible organ damage. For cost-effectiveness and better patient outcomes, third-party payers should consider implementing reimbursement incentives that reward health systems and providers for better STI screening practices. (Schmidt et al., 2019).

Most patients schedule visits with their primary care provider rather than any other medical professional. Therefore, syphilis screening recommendations lean towards being initiated during primary care visits. The CDC recommended using plain language, open-ended questions,

listening, and nonjudgmental gestures when developing syphilis screening tools (CDC, 2022). This recommendation is partly due to the stigmatism associated with using the word sexual infection and making patients uncomfortable while discussing their sexual health. Handouts with social media links and internet references that reinforce in-office discussions can also be helpful in other clinical settings and well appreciated in younger adult populations (Schmidt et al., 2019).

Before issuing the screening tool to patients at the project site, the patients who voluntarily participated filled out a consent form and then received the questionnaire to complete in each exam room confidentially before the provider began their scheduled appointment. The screening questionnaire consisted of yes and no sexual health questions. Participants who answered any questions with 'yes' were marked as high-risk and alerted the provider and P.I. to inquire further. For example, if the patient were positive for high-risk sexual behavior but refused syphilis testing, P.I. or the provider would extend sexual health education, offer follow-up appointments, and provide contact information for the local health department. Before proposing STI testing, the provider and P.I. informed the patient that a positive syphilis test was reportable to the state health department within 24 hours, and they also would be notified immediately for treatment (CDC, 2021e).

Needs Analysis

Despite efforts from the CDC, USPSTF, and local health departments to raise awareness and set guidelines, syphilis remains on the rise in the U.S., especially in rural areas. Many low-populated areas lack available resources to screen, educate, test, and treat STIs. Therefore, primary care clinics are encouraged to implement screening tools that help capture at-risk or high-risk patients during scheduled appointments.

Rural Primary Care Clinic

Although recommended, STI screening is not mandatory in primary care practice. The rural primary care clinic where this project took place has approximately 150 patient visits per week; however, there is only one provider, making additional screening more time-consuming. In addition, patients visit the project clinic site for various health concerns, and the P.I. and provider only identified a few patients as candidates for screening. Patients' conditions frequently seen at the project site included hypertension, pulmonary disease, heart failure, diabetes, arthritis, kidney disease, and other medical issues. Given the increased rate of syphilis in rural communities, STIs could increase comorbidities; therefore, these adult patients would benefit significantly from sexual health screening.

SWOT Analysis

SWOT Analysis (short for strengths, weaknesses, opportunities, threats) is a business strategy tool to assess how an organization compares to its competition (see Appendix B). A SWOT analysis was performed to assess current internal strengths and weaknesses within practices and patient health. Strengths include education, skills, experience, and dedication. The weaknesses increase the number of patients with the inability to pay for services, lack of additional providers, and an overwhelming number of repeat patient visits. The practice sees an extensive amount of patients per day, which minimizes the time for sexual health screenings, education, and comprehensive physical assessments.

Opportunities and threats to the practice were examined. However, rural areas lack healthcare resources, leading to illnesses and worsening disease processes that quickly become life-threatening if untreated. The rise in STI infections greatly exacerbates chronic health problems. When patients are financially unable to visit their provider or lack knowledge of risks

for infections and public health threats, it leads to the danger and spread of diseases and increased costs on the health systems.

Early detection and prevention emphasize the need for improvement and standardized screening tools for all providers. Opportunity includes implementing a syphilis screen tool that allows shorter assessment time, improving education, and testing for preventable infections. The tool also increases awareness, lowers healthcare costs, and lessens the number of unnecessary clinic visits. In addition, screening helps prevent transmission throughout the community and decreases future complications for those affected by the progression of untreated syphilis (AAFP, 2019).

Problem Statement

Syphilis remains problematic and is growing increasingly worse in the U.S., thus needing an immediate intervention to stop transmissions in rural adult populations. STI clinics specialize in screening and treating nearly all types of infection; however, rural primary care clinics only screen patients seeking treatment for their symptoms. Primary care providers have an opportunity to screen the sexual health history of their adult patients even when signs are not visible or recognized. Utilizing a syphilis screening tool offers an opportunity to assess high-risk patients and offer education, testing, and treatment. It also allows the provider to implement guidelines that can be utilized in the future. It also allows the provider to implement evidence-based guidelines that can be used in the future. Although syphilis is increasing, screening rates remain lower than desired; therefore, the CDC developed screening guidelines, recommendations, and programs to limit its transmission, reinfections, and complications (AAFP, 2019).

Aims and Objectives

In March 2022, the DNP project implemented a syphilis screening tool for a rural primary care clinic provider. The aim is to increase education and awareness among adults at high risk for STIs in conjunction with increasing the number of syphilis testing. The project objectives included: (a) increased patient education regarding sexually transmitted infections and risky sexual behaviors; (b) increased awareness among primary care providers concerning the importance of syphilis screening, education, and testing; and (c) reduced rate of syphilis among adults who live in rural areas and nationally.

Review of Literature

The literature review comes from previously published work on STI topics used in past research. This DNP topic involves a rural primary care clinic provider at the forefront of addressing risky sexual behaviors, providing awareness with education, offering tests, and administering treatment to patients with minimal access to specialized STI healthcare services. The P.I. used topics of screening for STIs and syphilis screening tools to search scholarly resources that could increase syphilis education and testing; and decrease the rate of STIs (U.S. Department of Health and Human Services [HHS], 2016).

Search criteria included dated material, full-text articles, journal articles, and reviews within the past five years. By broadening the range of years to 10, the results provided more background information and supportive literature relating to the history of syphilis for this DNP project. Jacksonville State University Houston Cole Library provided access to research Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, and ScienceDirect. The keywords were used in CINAHL: syphilis screening tools, syphilis education, rural primary care providers, adult patients, and STIs. CINAHL yielded 103 articles. Results were

narrowed using peer-reviewed academic journal limits within the last ten years, reducing sources to 27. Additional articles were eliminated due to irrelevant risk factors that did not relate to syphilis education and screening, were not in full text, and did not occur in primary care settings that supported this project.

PubMed yielded 58 articles with helpful information and key terms, including syphilis screening tools, STIs, rural primary care clinics, providers, and adult patients. Results were narrowed using the peer-reviewed academic journals and ten-year limits, adding combination terms such as STI screening tools, primary care screening tools, and STI clinics/syphilis. The yield was 49.

Medline had 31 hits using key terms: syphilis screening tool, rural primary care, adult patients, and STIs. Results were narrowed using peer-reviewed, academic journal limits, and within the last ten years, adding terms: men having sex with men, risky sexual behaviors, and primary care providers/syphilis, which yielded 12. To compare the article with other countries, the U.S. was not specified. The themes eliminated did not support or relate to the goal and support of this DNP project and yielded 7.

The research did not provide a conclusive screening tool for identifying high-risk patients for syphilis and other STIs. Some reviews referred to syphilis screening tools as testing, but it was necessary to determine the patients at high risk for STIs before offering tests. USPSTF recommends screening and testing annually or more frequently for HIV and other high-risk patients. The syphilis screening tool was a crucial step in assessing patients and creating awareness using a questionnaire in the primary care setting. Unfortunately, no mandates or policies were in place to evaluate for STIs regularly during scheduled clinic visits. Some significant articles supporting this DNP project are discussed below (see Appendix C).

Hunter et al. (2014) expanded on primary care providers having the opportunity to screen, counsel, test, diagnose, and effectively treat most STIs like syphilis. Their key points suggested that screening for an STI could include counseling patients about risk-reduction sexual behavior that could prevent syphilis. In addition, Hunter et al. offered suggestions on using past medical history to start sexual health communication. The P.I. incorporated it in the DNP project questionnaire and provider's history intake form that patients must complete on initial visit and annually (see Appendix D). The article also collaborated with local public health officials about initiating screening guidelines within the practice and determining which STIs are more prevalent in the immediate areas (Hunter et al., 2014).

Pinto et al. (2019) conducted a cross-sectional survey of demographics and syphilis screening practices administered to primary care physicians, nurse practitioners, and physician assistants. They found that women were more likely to be screened during wellness visits, including genitourinary symptoms. Asymptomatic men were rarely screened despite MSM having the most significant percentage of new syphilis cases. They also concluded that the burden of screening has shifted to primary care providers unaware of the syphilis epidemic (Pinto et al., 2019). This article recognized that it is incumbent upon primary care providers to add sexual health screening tools to patient assessment during clinic visits. Pinto et al. relate to the DNP project implementation by addressing all patients within the questionnaire who may be at high-risk for STIs such as syphilis, including pregnant women.

A study by Pearson et al. (2021). was conducted at STI clinics in metropolitan areas across the U.S. They wanted to understand the needs of patients seeking medical assistance and if providers would be able to accommodate their needs. In conclusion, patients were primarily concerned about readily accessible care that was anonymous and confidential (Pearson et al.,

2021). Although primary care providers can screen, provide education, and order syphilis testing if the patient agrees, most appointments are required, with only a few walk-ins allowed, which decreases the availability of immediate syphilis treatment and tracking availability. In the DNP project, assessing the needs of patients included sexual health; therefore, using a syphilis screening tool could help the provider determine which patients need education and testing for STIs. Allowing patients to answer sexual health questions privately could increase their confidence in sharing information with the provider.

Goza et al. 2017 collaborated on the connection between syphilis, HIV, and neurosyphilis. They also discussed the types of testing used for initial screening or in conjunction with other tests to confirm a diagnosis of syphilis. This review recognized high rates of coinfection with HIV among the MSM population as both infections can be acquired following high-risk sexual behavior. When individuals are immunocompromised from HIV, the progression of syphilis to neurosyphilis is often accelerated. For those diagnosed with syphilis, the CDC recommends they get tested for HIV. In the DNP project, the syphilis screening tool helps the provider recognize patients who may already have an STI or HIV but may not have been aware or screened for risk of syphilis or other STIs. Education would be essential for these patients to prevent spreading to others and lessen the chance of neurosyphilis. This literature review also suggests that patients presenting with clinical symptoms and a high-risk sexual history be recommended tests for syphilis and HIV (Goza et al., 2017).

This review gives a history of the detection, transmission, and treatment of syphilis since the 18th century. Despite the progression of science and technology and a cure for syphilis, sexual health knowledge and culture disparities remain persistent. Barnett acknowledged that prenatal screening programs in the early 21st century have reduced rates of congenital syphilis infections

(Barnett, 2018). This article reminds the P.I. of how the unethical Tuskegee study and the label of syphilis placed on 'loose women' continue to linger in the hearts and minds of communities today. Due to sensitivity and patients' requests for anonymity, the provider and P.I. obtained consent verbally from each patient. They were informed verbally and written about the type, goal, and benefits of participating in the DNP project and measures taken to maintain confidentiality. The provider and P.I. told patients that at any time, they could decline to participate in the project by notifying the provider and P.I. via phone or email.

Although this review by Cantor et al. (2016) has more than one goal, the key focus of this project was to support the effectiveness of a syphilis screening tool in patient education and STI awareness. In addition to knowledge, providing tests for high-risk individuals contracting and transmitting STIs to others in rural communities throughout the U.S. Cantor et al. (2016) literature review found no evidence regarding the effectiveness of screening on clinical outcomes or the efficacy of specific risk assessment instruments. However, Cantor et al. (2016) reported lower syphilis rates when screening high-risk individuals every 12 months, as recommended by the USPSTF. Adding sexual health history to the provider's standard history intake form has shown to be a beneficial concept during this DNP project implementation. The review also reported that early syphilis detection rates were higher if HIV-positive men or MSM were screened every three months (Cantor et al., 2016). Implementing a syphilis screening tool can be the foundation for initiating syphilis and other STI awareness and offering tests among adult patients with high-risk sexual behaviors.

Based on current evidence, the USPSTF concludes that the benefits of screening for syphilis in pregnant women substantially outweigh the harms. Jin (2018) posted this review from the USPSTF syphilis screening recommendation report so everyone could access it for free. These

recommendations suggest treatments earlier in pregnancy are more effective than later; therefore, early testing will help prevent harmful outcomes or the death of a fetus (Jin, 2018). This review provided further evidence that supports the need for a syphilis screening tool to detect risky sexual behavior patients, increase awareness and education, and offer tests.

This literature review supported implementing STI screening in rural primary care practices and was consistent with the latest research for increasing patient awareness. Ong et al. (2018) discussed strategies to decentralize sexual health services by introducing sexual health screening into primary care settings. Increasing the number of syphilis testing on patients or members of local rural communities was the goal. Detection through screening tools such as questionnaires and medical history intakes was key to recognizing patients who were unaware, uneducated, and lacked signs of syphilis or other STIs. A syphilis screening tool is one strategy to motivate providers in rural clinics to educate and create awareness which could lead to increased testing, prescribing treatment, and preventing the spread to others (Ong et al., 2018).

Theoretical Model

The theory used to guide this DNP quality improvement (Q.I.) project is Lippitt's Phases of Change Theory. It includes seven steps based on implementing an external change tool to implement a plan that promotes change using the nursing process (Assessment, Planning, Implementation, Evaluation).

Lippitt's change theory focuses on the steps: (see Appendix E)

- Becoming more aware of the need for change
- Developing a relationship between the system and change agent
- Defining a change problem
- Setting change goals and developing an action plan for achievement

- Implementing the change
- staff accepting the change and stabilization of the plan
- Redefining the relationship of the change agent with the system (Barrow et al., 2021).

After discussing the DNP project and evidence-based facts about syphilis, the provider realized that the clinic was not screening patients for STIs. The P.I. collaborated with the provider on the best approach to assess at-risk patients who needed further evaluation. Research by the P.I. yielded a syphilis screening tool previously used by Susan Elliot in a similar project (Elliott, 2019). The P.I. introduced a modified and easier-to-read version of Susan Elliot's syphilis screening tool to help identify the patients recommended for education and syphilis testing.

This project aimed to identify high-risk patients for syphilis, educate, offer tests, create patient awareness, and treat if necessary. Since the syphilis screening tool was adequate, the clinic provider could implement it into the daily clinical assessment.

Methodology

This project intended to increase screening, education, and testing through rural primary care clinics on patients assessed to be at high risk for syphilis. Primary care providers are more likely to encounter patients in rural communities which lack sexual health resources or education. Implementing a syphilis screening tool increases provider and patient awareness and allows for treatment and education recommendations. A modified and approved Susan Elliot syphilis screening tool was included in this project to help guide the recognition of patients who were vulnerable to syphilis and participated in risky sexual behaviors.

After confirming ages, the provider and the P.I. provided patients with the screening questionnaire attached to an authorization. After verifying consent to participate in the DNP project, patients completed the questionnaire while waiting to see the provider at the scheduled

visit. Patients would answer yes or no questions regarding sexual history with multiple or new sexual partners, commercial sexual encounters, male with male sex partners, and history of other positive STIs. If any questions had a yes answer, the P.I or provider provided education and offered to test for syphilis or additional STI testing. The provider reviewed results with patients post any agreed testing.

Setting, Population, and Recruitment

The project took place at a rural family primary care clinic that provided care to patients of all ages. The patients answering the questionnaire on the syphilis screening tool were aged eighteen years and older and previously scheduled to see the provider for other health issues. Although the daily appointments totaled 20-30 patients with 5-10 walk-ins, several patients returned to the clinic for repeated visits or follow-ups.

The community adult population was approximately 15,900 residents. Newly diagnosed syphilis rates per 100,000 residents in 2019: the local community had 11.7/100,000; the state had 67.2/100,000, and the U.S. had 39.7/100,000. The population of interest at the project site included one primary care provider and adult patients. The provider agreed to use a syphilis screening tool to identify individuals at high risk for syphilis and other STIs. There was no recruitment for this project (Suburbanstats.org, 2019).

Inclusion/Exclusion Criteria for Providers

Inclusion criteria:	Exclusion criteria:
Adults 18 years and older	Individuals under the age of 18 years
Males and females	Adults no longer sexually active

Consent

The DNP project's primary purpose was to educate, screen, and refer the patient population who were at high risk for testing. The P.I. utilized a standardized syphilis screening tool to determine which patients would be good candidates to participate in the project. The provider and P.I. screened patients collaboratively. The provider and P.I. discussed instructions on patient consent for participation and proper questionnaire delivery. Based on the International Review Board (IRB) protocol, the provider and P.I. consented to each participant before the patient filled out the sexual health questionnaire (see Appendix F). Due to the sensitivity of discussing sexual health and remaining anonymous, the patients preferred to give verbal consent instead of written consent before completing the STI questionnaire. However, the provider and P.I. gave each participant the consent form to read and ask questions before verbally consenting to the provider and P.I. After obtaining the consent from the participants, P.I. explained that there were minimal risks for participating, and the project was strictly voluntary. Also, P.I. told the participants that the state or local health departments did not influence the project. It was emphasized that they could decline to participate at any time, and the P.I. and provider would maintain confidentiality and privacy of all identifiable collected data throughout the project.

Design

The DNP project pre-survey and chart review determined that sexual health risk was not assessed in rural primary care clinics. A local provider agreed to serve as a preceptor and mentor for this project to improve patient education and provide tests and treatment for syphilis and other STIs within the community. After researching community needs and collaborating with the provider, the project was presented to the IRB for approval before project initiation. Although IRB approved a syphilis screening tool used by Susan Elliot, the provider and P.I. modified the tool to

address a patient population with limited reading skills and lower than 8th-grade education so they could comprehend the sexual health material provided. Based on an existing questionnaire from Susan Elliot and input from the site provider and project chair, this P.I. redesigned the questionnaire given to the patients (Elliott, 2019). The revised syphilis screening tool provided patients with easier-to-read questions.

If the patient circled 'yes' on any of the questions, the provider conducted further discussion regarding syphilis testing. Upon completion of the visit and if the patient agreed, the provider used the opportunity to provide continuing education, order testing, and follow-up. The completed questionnaires would be stored securely in the provider's office in a locked desk drawer until the P.I. could evaluate them. Due to office closure, patient exposure risks, and participant illnesses related to COVID-19, the implementation took place over eight weeks to increase the project sample size.

Based on instruments used in a past project, the surveys and evaluation tools used in this project provided insight into provider buy-in, project sustainability, and process improvement. Using syphilis information from the CDC, the P.I. discussed current practice and syphilis awareness in an interview with the provider (CDC, 2017). Before receiving the syphilis tool training, the project site provider also completed a Likert-style pre-implementation survey to evaluate STI knowledge and support to mentor the DNP project effectively. The provider completed the post-implementation evaluation and submitted it within two weeks after completing the DNP project.

To increase the sample size for the DNP project and allow provider participation, the provider and the P.I. assessed the patients collaboratively. The P.I. discussed the proper consent process with office staff and encouraged patient anonymity as well. Patients who answered yes to

any screening questions were offered syphilis education and STI testing and given contact information if they had questions after their visit. After the patient visit, P.I. used the Likert scale to obtain patient feedback. A five-point scale allowed individuals to express how much they agree or disagree with a particular statement (McLeod, 2019).

Chart Review

Chart review confirmed that no syphilis screening had been used to assess the patient's sexual health in the provider's primary care clinic. In addition, no syphilis billing codes were documented over the previous six months as per the provider. A post-implementation chart review was done to identify STI education documentation and recorded syphilis billing codes. The questionnaires did not contain patient identifiers, and the documents used in the DNP project did not include identifiable data.

Risks & Benefits

This project had minimal to no harm to patients and providers participating in this project. The DNP project risks for patients included embarrassment and anxiety about discussing their sexual health history. To minimize shame and fear, patients completed the questionnaire in a private setting with no discussion with P.I. or provider if not warranted or if they declined further assessment. The P.I. reassured the patients and provider that all surveys and other project information would remain confidential. The P.I. adhered to all ethical standards required to protect the patients and site providers.

Benefits to the patients and provider included increased patient assessment for syphilis and improved screening guidelines. Better healthcare outcomes and decreased spread of STIs create growth in the local community and the U.S. economy. Practicing safe sexual health confirms awareness of harmful infections and knowledge of available resources for education and treatment.

Compensation

The P.I. could never compensate fully for the valuable DNP project educational opportunity received and given to the provider and patients. Due to the unpredictable number of participants and budget ability, the patients were offered a sexual health pamphlet from the CDC with contact information for future concerns or questions and bottled water. The P.I. made available for the provider a lunch ticket, extra syphilis screening tools, posters, STI pamphlets, and reporting contact information.

Timeline

The first summer and fall semesters consisted of defining the clinical problem for the DNP project and developing and finalizing the PICOT question. The P.I. communicated with the project site provider about project ideas and their availability. After setting up a meeting, the P.I. also traveled to the project site to meet with the provider to start chart reviews and discuss the sexual health needs of the local community. After determining the need for the DNP project, a literature review began. The P.I. completed a table of evidence on implementing a syphilis screening tool in rural primary care clinics to assess patients with risky sexual behaviors. The literature review also included strategies to create STI awareness, provide education, and recommend testing and treatment to stop the spread of syphilis. By the end of the Fall semester, the P.I. completed the initial literature review, theoretical methodology selection, the initial draft of the project proposal, and CITI training (see Appendix G).

During the spring semester, the literature review continued, and the P.I. submitted a project plan to obtain IRB approval. After receiving IRB approval (see Appendix H), the P.I. and provider began implementing the DNP Project. Throughout the project, the P.I. communicated weekly with the project chair and traveled to the DNP project site until completed over eight weeks. After

finalizing the post-implementation, data collection, and statistical analysis, the final project's preparation was completed, reviewed, and submitted to graduate studies. The last semester consisted of completing a final manuscript, poster, narrated PowerPoint, electronic portfolio, and DNP Dissemination.

Budget and Resources

To implement the DNP project and ensure no financial burden went towards the site provider or patients, the P.I. required a budget to secure supplies, documentation, and transportation. The P.I. purchased pens, a lockable storage container, and poster holders. The P.I. printed consent forms, syphilis screening tool questionnaires, color STI posters, surveys, and revised history intake forms. Along with P.I. incurred travel expenses and refreshments for the patients and provider, the budget was \$600 with an actual spend of \$465 (see Appendix I).

Statistical Evaluation

While analytical statistics help conclude a specific sample of data, descriptive statistics give more information about the data analyzed. Descriptive statistics were used in this project to describe the characteristics of the study population. It was also chosen to assess patient and provider awareness of STIs and syphilis testing; the target was high-risk patients using a syphilis screening tool at a rural primary care clinic. Analytical statistics helped to determine the effectiveness of a syphilis screening tool in identifying high-risk sexual behaviors during the implementation. Fisher's exact test was used to compare syphilis screening and testing frequencies before and after the implementation. The P.I. solicited the assistance of a doctorate-prepared Associate Professor of Epidemiology and Biostatistics and the DNP project faculty chair to complete the data analysis.

Data Maintenance and Security Evaluation

The P.I gave the provider a background evaluation and post-implementation surveys to determine the need and effectiveness of syphilis screening tools in primary care clinics. The P.I. collected the completed questionnaires by summing the number of patients who agreed to participate, answered yes, and answered no to the questions. The P.I. communicated with the provider to confirm the number of adult patients seen in the clinic, the high-risk patients who received syphilis education, and the number of syphilis testing codes used for billing over the eight-week project implementation period.

The data collected contained no patient or provider identifiers. They were kept secure in the provider's office and with the P.I. After completing the project, the final manuscript was completed and submitted. The P.I. destroyed all data following HIPPA guidelines and the IRB protocol.

Results

This section reviews the data analysis results, including provider surveys, questionnaires completed, and a chart review of education and syphilis billing codes. Since the project site had one provider, the P.I. collected information verbally and written on newly diagnosed patients with syphilis or other STIs. The P.I. also examined the provider's background knowledge and other key findings.

Results of Chart Review

Out of the 1190 patient office visits pre-implementation, no patients were identified as being screened for syphilis by the provider at a rural primary care clinic (0%). Post-implementation patient office visits were 563. One hundred twenty-four syphilis screening tool questionnaires were completed (22%). Five questionnaires contained yes answers (4%), 119

questionnaires with no answers (95%), and the provider did not document any syphilis testing codes for billing (0%). Out of the five patients identified with risky sexual behaviors, four (80%) patients refused syphilis testing and received education regarding syphilis with resource information, and one patient (20%) had syphilis testing orders (see Table 1). Since the sample was small and had at least one part of the data table less than five, Fisher's Exact Test in R -was used (R Core Team, 2021). Tests were calculated on the number of patients screened as high-risk for syphilis pre-and post-implementation (zero, 5). After the implementation, the provider referred more patients for testing; therefore, the Fisher's Exact Test Count data showed a p-value of 0.00035, which was statistically significant. (see Table 2)

Results of Evaluation and Survey Responses

The provider completed evaluations and surveys to help determine where the clinic's stance was on evaluating patients for STIs, specifically syphilis, and their ability to implement a syphilis screening tool. Although the primary care provider has been practicing in a rural clinic for several years and was knowledgeable about STIs, the provider was unaware of the USPSTF and CDC recommendation guidelines for syphilis screening and had never used syphilis screening tool before implementing the project. The provider stated that unless the patient had apparent signs or symptoms of STIs, there was no discussion of sexual health.

A pre-and-post survey provided five Likert-style questions assessing a provider's utilization of a syphilis screening tool, as shown in Table 3. The pre-and post-implementation evaluations helped determine the effectiveness of the syphilis screening tool and the provider's probability of using it in the future. The scales ranged from 1 (always) to 5 (never). The low score corresponded with a high likelihood of addressing sexual health and the possibility of ongoing use of a syphilis screening tool.

Question 1 assessed the provider's frequency of asking how often the provided asked patients about their sexual health history. The provider indicated pre-and post-implementation patients were infrequently (score 3) initiated an assessment of their sexual history. The medium score coincided with an uncertain likelihood of addressing sexual health. It was inconclusive that the provider may or may not initiate a sexual health assessment with or without a screening tool.

Question 2 assessed the provider's frequency of advising patients about risky sexual behaviors. The provider expressed pre-and post-implementation that patients were sometimes (3) informed about risky sexual behavior. There was uncertainty about addressing sexual health and advising about risky sexual behavior will continue in most patients with or without a screening tool.

Question 3 assessed the frequency of the provider assessing patients' knowledge and awareness of syphilis and its health complications. Pre-implementation, the provider would sometimes (score 3) evaluate the patient's knowledge; however, the provider assessed their knowledge more often (score 2) post-implementation. The low score corresponded with a high likelihood of ongoing use of a syphilis screening tool. It is a likely conclusion that the provider would continue to assess the patient's knowledge of syphilis and its health complications.

Question 4 assessed the provider frequency in assisting patients in preventing STIs using various resources. Pre-implementation, the provider sometimes would provide patients with resources to help prevent and stop the transmission of syphilis. The provider corresponded with the medial score (3) post-implementation with an undetermined likelihood of offering STI prevention resources. However, the provider spiritedly commented about following up with patients with positive STI screening after leaving the clinic and providing other contact information for available resources.

Question 5 of the pre-survey and post-survey assessed the provider's level of preparedness to implement a syphilis screening tool to help identify high-risk patients before and after this implementation. After pre-implementation education, the provider responded enthusiastically about being prepared to deliver this tool to the patients. The provider's preparedness remained intact post-implementation, which showed the significance of the syphilis screening tool. The scores (score 2) ranged from 1 (always) to 5 (never), supporting the provider's readiness for launch.

A post-implementation survey consisted of two yes or no questions, which asked if the provider felt the syphilis training tool helped identify risky sexual behaviors, offered to test, and provided more effective education. The second question asked the provider whether the training was helpful, and both answers to these questions were 'yes' (see Table 4).

The provider found the tool helpful and groundbreaking for better patient and local community outcomes. Per the site provider, common concerns included patients' unwillingness to discuss sexual health, unawareness of high risks for syphilis, and lack of education about available testing and curable treatments. Continuing lack of time for assessment of STIs and teaching, an overwhelming number of patients, and multiple health issues to address in one visit are other common reasons innovations and implementations are unsupported or unsuccessful in rural primary care clinics. Also, per the provider, state and local health departments and infectious disease organizations lack collaboration with primary care clinics about available resources and the need for increased screening for STIs.

Discussion

This DNP project was determined to readdress the need to increase syphilis awareness through education, screening, testing, and consistent follow-up to help decrease the climbing rate of this infection in the local community and the U.S. Other specialized areas such as county health departments and infectious disease researchers are aware of the effects that syphilis has on overall health, the economy, newborns, and healthcare systems; however, these statistics and knowledge are not widespread in the medical community. Syphilis screening recommendations are current and consistent with evidence-based practice; however, the availability of providers is too few to implement screening, especially in rural areas. Mixed methods of qualitative and quantitative data were used to measure the significance of this project.

Hunter et al. (2014) review showed the desperate need for primary care providers to address the spread of sexually transmitted diseases since standalone STI clinics are becoming more nonexistent, primarily due to funding. Current data supports the need for screening tools, specifically for syphilis; however, provider education and awareness are also needed to create guidelines within their practice (Weber, 2019; Wheeler, 2021). During the project, the provider acknowledged that no correspondence or screening recommendations are shared from other entities to help stop the spread of STIs. Syphilis is a curable infection if detected and treated early.

Another finding that supports the need for syphilis screening tools is that men who have sex with men have the highest syphilis infections and STIs yet are the least likely population to get screened. Since women are more likely to report or acknowledge symptoms, a provider is unlikely to screen men (Schmidt et al., 2019). The USPSTF (2016) suggests only screening high-risk adult patients; however, screening is one of the best ways to know which men are at risk. As

forementioned, MSM, black men, and poor populations comprise the largest group of individuals with STIs. Local providers can make a positive impact with screening guidelines in place.

Another review that prevents patients from initiating a conversation about their sexual health is an embarrassment. Syphilis is considered an old infection; however, the havoc it causes on the body makes it just as dangerous today as it did centuries ago if left untreated. Society considers STIs shameful and sinful, making some providers indecisive about initiating a discussion with patients who may have been exposed or transmissible (Peterman, 2009). A question within the project survey involved barriers that the P.I. experienced when speaking to a patient at the project site about their sexual history. Patients became instantly uncomfortable and stoic, which led to syphilis screening using written questions that patients could answer privately, compared to an open verbal discussion with the provider.

Implications for Clinical Practice

Increasing the number of syphilis testing on high-risk patients in rural primary care clinics was the aim of this DNP project. The project created awareness among the provider and the patients who admitted to not having their sexual health addressed in other screenings. Evidence supports that primary care providers are ideal for assessing all health issues that may concern future outcomes and community health hazards (Hunter et al., 2014).

Implications for Healthcare Policy

Many primary care practices do not have policies addressing screening guidelines they must follow for sexual health. There are billing policies put in place by insurance companies to support the need for testing and diagnosis. Since the long-term cost of treating syphilis puts enormous stress on the economy, it would behoove payors to standardize syphilis screening tools

in primary care practices (CDC, 2021b). In addition, this would demonstrate the effectiveness of this project and create grounds for future studies.

Implications for Quality/Safety

Quality improvement and patient safety should always be a priority in healthcare. Accountability also plays a significant role in quality healthcare for patients and communities. Evidence-based research recommendations and practices lead to better patient and family outcomes. The syphilis screening tool demonstrates how detection, education, and prevention lead to lesser illnesses and transmission across the community. Allowing patients to answer questions about their health creates awareness and conversations with their providers, family, and friends who may be unaware of health dangers.

Implications for Education

The syphilis screening tool in this project opened the door for education for the provider and patients. Minimal awareness creates opportunities for growth in healthcare and the community. Sexually transmitted infection, specifically syphilis, has been an unspoken conversation for many years, making it a haven for education and early detection to prevent worsening symptoms of chronic disabilities. Open-ended questions within this project not only created awareness but also improved communication.

Limitations

The main limitation of this project was patients' inability to discuss their sexual health with the provider. Many individuals do not understand the risk factors that syphilis imposes if left untreated; however, embarrassment and fear of judgment have been a lifelong hindrance to eradicating syphilis. Along with patients, providers are unaware of the growing rates of syphilis

and their role in increased testing, leading to a decrease in transmission and health disparities when detected early.

Other limitations were related to a small practice with limited resources and time constraints. A sole provider in a small rural clinic often provides medical care to a large group of patients who have increased health issues. The project was also implemented when staffing was limited and the provider had COVID-related restrictions. As mentioned earlier, the sample was small based on the number of patients who visited the clinic and agreed to participate in the DNP project. The project needed a more extended implementation period and additional providers to increase the sample size, provide more education, and recommend more testing.

The project was not computerized and completed by the patients without supervision or identifiers; it is unclear whether they read all the questions and recorded answers truthfully or accurately. Since this P.I. did not work at the project site, there was a minimal chance of bias or influence on whether the patients completed the screening tool; however, the limitation could be present if it were to satisfy the provider. The provider is now aware of the syphilis epidemic in the community and the U.S., so implementing the syphilis screening tool would benefit the patient's short- and long-term outcomes and open more communications about sexual health.

Dissemination

The project's findings have been disseminated using a syphilis screening tool to decrease the rate and transmission of syphilis through increased education, testing, and awareness in rural primary care clinics. Due to the reluctance of providers and patients to discuss sexual health, this project only revealed a minute number of patients who were screened as high risk for syphilis. This DNP project is a starting foundation with the hopes of creating a pavement for others to build

on to decrease morbidity and mortality rates and then finally irradiate syphilis. The DNP manuscript will be in the Jacksonville State University's Digital Commons repository.

Sustainability

This project implementation is the beginning of a sexual conversation. Through dissemination, brochures, and posters (CDC, 2019; Florida Department of Health, 2021; HHS, 2019), it was hopeful that the primary care provider would incorporate sexual health into the practice's routine history and physicals (CDC, 2022). Perhaps the provider could inspire other providers to be aware of syphilis and its impact on patients and local communities. Providers could also refer patients and provide contact information for county health departments if they are too embarrassed to discuss sexual health with their provider.

This project had barriers that could be addressed and modified to fit other practices to educate patients about STIs and their harmful effects on adults and unborn children. In addition, patients can advocate in local communities and with families to help create awareness and pursue testing if they are involved in risky sexual behaviors.

Plans for Future Scholarship

This P.I. was inspired by other sexual health projects, which means other data is available to support syphilis screening, detection, education, testing, and treatment. Syphilis screening tools are available in different formats and questionnaires that may need modifications that could be more helpful in other medical establishments. The state health departments have readily available resources but require other entities to reach out to them first. Studies have found collaboration is crucial to educating patients, providing resources, follow-up care, community awareness, and better patient outcomes (Hunter et al., 2014).

This project revealed barriers that prevented patients from getting screened and tested for syphilis. Persistency and provider support can help sustain screening of patients who may be at high risk for STIs yet unaware of available testing and treatment. In addition, many studies support syphilis screening recommendations that the USPTF and the CDC have recently updated yet need implementation.

Conclusion

Syphilis cases have remained on the rise for the last decade and have nearly doubled in the previous three years. The CDC suggested that providers make STD screening and timely treatment a standard part of medical care, especially for young adults, pregnant women, and gay and bisexual men. Despite nationwide efforts, syphilis rates are not slowing down. The cost to the economy continues to grow, decreasing the availability of preventative resources and treatment centers in rural areas.

Primary care clinics remain at the forefront of screening patients and increasing tests and treatments. Yet resources and guidelines are not in place to help support providers in rural areas who are already overwhelmed with treating many other health conditions (Hoover et al., 2015; Hunter et al., 2014). Additional research is needed to help reduce barriers and create patient and community awareness. Students, providers, and communities should not allow the Tuskegee syphilis disaster to discourage anyone from addressing this infection. Instead, it should be empowering for practices to collaborate and eradicate syphilis forever and not let those victims' and families' sufferings be in vain. As part of routine patient assessment, initiating syphilis screening tools in primary care practice has proven effective in increasing education and testing for STIs during this DNP project.

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Tables

Table 1: Data Evaluation Tool

	Pre- Implementation Data	Post- Intervention Data
Number of Adult visits	1190	563
Number of tools completed	0	124 (22%)
Number of tools completed with no answers	0	119 (95%)
Number of patients who refused to test	0	4 (80%)
Number of syphilis testing codes	0	0 (0%)

Table 2: Fisher's exact test

Data review pre-and post-intervention

	Pre- Implementation Data	Post- Intervention Data	<i>p-value</i>
Number of tools with yes answers	0	5 (4%)	0.00035

Table 3: Likert scalePre- and post-provider survey using the *Likert scale*

Question	Scale	Score Pre-Implementation	Score Post-Implementation
Asking about sexual health history	From 1 (always) to 5 (never)	3	3
Advising patient about risky sexual behaviors	From 1 (always) to 5 (never)	3	3
Assessing the knowledge and awareness of syphilis and its health complications	From 1 (always) to 5 (never)	3	2
Assist patients in preventing STIs using resources	From 1 (always) to 5 (never)	3	2
Perceived preparedness to implement a syphilis screening tool to help identify high-risk patients	From 1 (always) to 5 (never)	2	2

Table 4: Surveys

Post Implementation Provider Survey

	Yes	No	Somewhat	Unsure	No answer
Do you feel the syphilis training tool helps identify risky sexual behaviors, offers tests, and provides more effective education?	Yes				
Did you find this training to be helpful?	Yes				

Appendix A

Syphilis Screening Tool

HELP STOP the SPREAD!

Syphilis Screening Tool

Syphilis is a sexually transmitted infection that is on the rise across the United States, especially here in Mississippi. This office is participating in an education project to improve syphilis screening and increase testing. Syphilis can be **cured**. By **VOLUNTARILY** answering a few questions, you will help increase awareness and decrease the number of syphilis cases in our area. These questions are **CONFIDENTIAL** and will **not** include your name and will not be a part of your medical record. If you do not participate, it would not be negative against this office.

FEMALES

1. Have you ever had a positive HIV test? Yes or No
 - a. If yes, have you ever had a syphilis test? Yes or No
 - b. If yes, when was the last time you were tested for syphilis?
2. Have you been to jail? Yes or No
3. Are you currently or recently a commercial sex worker? Yes or No
4. Do you have a new sex partner or more than one sex partner? Yes or No

MALES

1. Have you ever had a positive HIV test? Yes or No
 - a. If yes, have you ever had a syphilis test? Yes or No
 - b. If yes, when was the last time you were tested for syphilis?
2. Have you been to jail? Yes or No
3. Are you currently or recently a commercial sex worker? Yes or No
4. Do you have a new sex partner or more than one sex partner? Yes or No
5. Do you engage in any sort of sexual activity with other men?

Tested

Not Tested

Appendix B

SWOT analysis

Rural Primary Care Clinic

Internal		External	
Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> - Skills from employees. - Experience. - Hard work. - Dedication. - Teamwork. - Trusting patient/provider relationship. 	<ul style="list-style-type: none"> - Increase the number of patients with the inability to pay for services. - Lack of additional providers. - Overwhelming number of patient visits per day. 	<ul style="list-style-type: none"> - prevent transmission throughout the community - Shorter assessment time. - Testing and education for a preventable infection. - Increased awareness. - Lowers healthcare costs. - Lessens the number of unnecessary clinic visits. 	<ul style="list-style-type: none"> - The spread of diseases. - Increased costs on the health systems. - complications for those affected by the progression of untreated syphilis.

Appendix C

Table of Evidence

Syphilis Screening Tool within Rural Primary Care Practice Patients

Clinical Questions:

1. Among rural primary care providers, does implementing a syphilis screening tool on adult patients older than 18 years of age compared with a no-tool increase the number of patients tested for syphilis?
2. Among individuals with risky sexual behavior, what is the effect of a syphilis screening tool in detecting, testing, treating, and preventing transmission?

Article #	Author & Date	Evidence Type	Sample, Sample Size, Setting	Study Findings that help answer the EBP Question	Limitations	Evidence Level & Quality
1	Hunter, Dalby, Marks, Swain, Schrage (2014)	Systemic Review	Keywords: STIs, Screening Prevention, Syphilis, HIV, U.S.	Consulting with local public health officials	Local conditions. Prevalence of disease.	Level II Quality: B
2	Pinto, Sneeringe, Muller (2019)	Cross-sectional pilot survey	Database: Science Direct Three major health systems Keywords: syphilis, MSM, testing, STI, screening	Syphilis screening rate. Educate providers about syphilis	Screening patients only when they are symptomatic	Level II Quality: A
3	Pearson, Kumar, Habel, Walsh, Meit, Barrow, Weiss, Gift (2021)	Controlled trials	Keywords: (STD) Sexually transmitted disease, STI clinic, Sexual health care, Health services, Sexual health	Barriers to sexual health care continue. Reduced available sexual health services	Metropolitan areas across the U.S. STI clinics	Level II Quality: A

4	Goza, Kulwicki, Akers, Klepser (2017)	Clarivate analytics, ProQuest, SCOPUS	Keywords: syphilis, sexually transmitted diseases, diagnosis	High rates of coinfection with HIV. Progression of syphilis to neurosyphilis	Pharmacy technology. Types of testing	Level II Quality: B
5	Barnett (2018)	Case Histories. Peer-reviewed	Keywords: Syphilis, syphilis history, screening, STIs, adults, primary care, prenatal	History of detection, transmission, and treatment of syphilis, prenatal screening	Peer review does not replicate or validate the research. The process relies on trust.	Level II Quality: B
6	Cantor, Pappas, Daeges, Nelson (2016)	Cochrane Central Register of Controlled Trials, and Cochrane Database of Systematic Reviews, MEDLINE	Keywords: complications of syphilis, STIs, syphilis screening, primary care	USPSTF routine screening for syphilis infection Asymptomatic persons at increased risk of infection	No studies addressed the effectiveness of screening, the effectiveness of risk assessment instruments	Level II Quality: A
7.	Jin (2018)	Patient Page Awareness	Keywords: Syphilis screening guidelines, primary care, adults, STIs, Recommendations, infectious disease	USPSTF Syphilis screening recommendations. Stages of syphilis infection	Catered to all pregnant women	Level II Quality: B
8.	Ong, Fu, Smith, Tucker (2018)	A cross-sectional analysis	Keywords: Syphilis screening tool, syphilis prevention, adults, U.S.	Strategies to increase syphilis testing in key populations	Did not focus on all adults. Focused on MSM, sex workers, prisoners	Level II Quality: B

Appendix D

History and Physical with Sexual History

Sexual health added to Primary Care Provider's Current History and Physical

Name: _____ Date of Birth: _____
 Home Phone #: _____ Cell Phone #: _____ Alt: _____
 Primary Pharmacy: _____ Pharmacy Phone #: _____ Location: _____
 Primary Insurance: _____ Secondary Insurance: _____
 Allergies: _____

Past Medical History: *Please check all boxes that apply*

Childhood illnesses:

- Measles
- Mumps
- Chicken Pox
- Rheumatic Fever
- Whooping Cough

Cardiovascular:

- High Blood Pressure
- Chest Pain/Angina
- Heart Attack
- Congestive Heart Failure
- Abnormal Heart Rhythm
- Heart Murmur
- Abnormal Heart Valve
- High Cholesterol
- Other: _____

Endocrine:

- Diabetes
- Thyroid Disease
- Osteoporosis

Genitourinary:

- Frequent Urinary Tract Infections
- Kidney Stones
- Enlarged Prostate
- Other: _____

Neurologic:

- Seizures
- Stroke
- Numbness
- Memory Problems

Hematologic

- Anemia
- Sickle Cell Disease
- Clotting Problems

Name of previous primary care physician: _____

List names of all physicians who are currently treating you:

Name: _____
 Specialty: _____
 Reason: _____

Immunizations:

- Usual Childhood Immunizations
- Tetanus (date: _____)
- Pneumovax (date: _____)
- Shingles (date: _____)
- Flu (date: _____)

Pulmonary:

- Seasonal Allergies
- Asthma
- COPD/Emphysema/Chronic Bronchitis
- Sleep Apnea
- Snoring
- Other: _____

Gastrointestinal:

- Reflux/Heartburn
- Ulcer
- Hiatal Hernia
- Hepatitis
- Jaundice
- Cirrhosis
- Diverticulitis
- Other: _____

Musculoskeletal:

- Arthritis
- Chronic Back Pain

Mental Health:

- Anxiety
- Depression
- Bipolar Disorder
- Schizophrenia

Cancer: _____

Other: _____

Name: _____

Specialty: _____

Reason: _____

Name: _____

Specialty: _____

Reason: _____

Surgical History:

- Appendix
- Gallbladder
- Hysterectomy
- Hernia Repair
- Coronary Artery
- Carotid Artery
- Prostate
- Joint- Knee/Shoulder/Hip
- Heart Catheterization
- Colonoscopy
- Other: _____

Current Medication List:

(Include Name, Strength, and Frequency):

Review of Systems- Please Circle all that Apply

- General: Weight change / fatigue / weakness / fevers / chills / night sweats
- Skin: skin change / nail change / itching / rashes
- Eyes: tearing / itching / vision changes
- ENT: runny nose / stuffiness / hoarseness / sore throat
- Cardiac: chest pain / palpitations / swellings in the legs
- Respiratory: shortness of breath / wheezing / coughing
- GI: nausea / vomiting / diarrhea / constipation / abdominal pain / rectal bleeding
- Genitourinary: urinary frequency / hesitancy / urgency / incontinence / burning
- Muscular: muscle weakness / stiffness / pain / joint swelling
- Neurologic: blackouts / dizziness / seizures / weakness in limbs
- Vascular: leg swelling / calf pain / varicose veins
- Psychological: anxiety / depression / memory loss

Does anyone in your family have any of the following? Who?

- High Blood Pressure _____
- Heart Disease _____
- High Cholesterol _____
- Diabetes _____
- Stroke _____
- Thyroid Disease _____
- Blood Disorder _____
- Depression/anxiety _____
- Cancer _____
- Other: _____
- Other: _____

Do you smoke?

- No, never
- Quit (Year: _____)
- Yes (# packs/day _____)

Do you drink alcohol?

- No, never
- Yes (How much, How often _____)

Marital Status: S _____ M _____ D _____ W _____

Level of schooling completed: _____

Occupation: _____

Religious affiliation/preference: _____

Do you have a living will? Yes _____ No _____

Do you have a designated Healthcare Power of Attorney?

Yes _____ No _____

(Name: _____)

Confidential Sexual Health History

1. Have you ever had a positive HIV test? Yes or No
 - a. If yes, have you ever had a syphilis test? Yes or No
 - b. If yes, when was the last time you were tested for syphilis? Yes or No
2. Have you been to jail? Yes or No
3. Are you currently or have recently been paid sex worker? Yes or No
4. Do you have a new sex partner or more than one sex partner? Yes or No
5. If you are a male, do you engage in any sort of sexual activity with other men? Yes or No

IF YES, TALK TO YOUR DOCTOR or LOCAL HEALTH DEPARTMENT

Appendix E

Theoretical Model

Theoretical Model Adopted from the Lippitt's Change Model

The theory used to guide this DNP QI project is Lippitt's Phases of Change Theory. It includes **seven steps** based on implementing an external change tool to implement a plan to promote change using the nursing process. Lippitt's change theory focus on:

1. Becoming more aware of the need for change
2. Develops a relationship between the system and change agent
3. Defines a change problem
4. Sets change goals and develop an action plan for achievement
5. Implements the change
6. staff accepting the change; stabilization

<p>Assessment</p> <ul style="list-style-type: none"> - Research syphilis statistics locally and nationally - Chart review of past syphilis screening - Assess knowledge of provider (Recommended screening by USPSTF) - Provider background 	<p>Step 1: Awareness of the need for change (Verify with EBP that syphilis is a major health problem)</p> <p>Step 2: Develops a relationship between the system and change agent (Assess the provider's capability to add a syphilis screening tool to routine assessment)</p> <p>Step 3: Defines a change problem (Assess provider's motivation and current tools to screen for syphilis)</p>
<p>Planning</p> <p>Create a syphilis screening tool that is easily readable and measurable</p>	<p>Step 4: Sets change goals and develop an action plan for achievement (Change objective – increase syphilis testing and awareness)</p> <p>Step 5: Implements the change (Questionnaire given to adult patients)</p>
<p>Implementation</p> <p>Provide adult patients with a questionnaire to complete</p>	<p>Step 6: Provider accepting the change; stabilization (Maintain the change)</p>
<p>Evaluation</p> <ul style="list-style-type: none"> - Post-implementation provider surveys - Post-implementation data collection 	<p>Step 7: Redefining the relationship of the change agent with the system (Evaluation effectiveness, perplexity, and sustainability of using a syphilis screening tool)</p>

Appendix F

Consent

Participant Consent Form

TITLE OF STUDY:

**Implementation and Evaluation of a Syphilis Screening Tool to Increase Patient Testing for
Syphilis Among Adults 18 Years and Older
in a Rural Primary Care Clinic**

This consent form is part of an informed consent process for a DNP student project, and it will provide information that will help you decide whether you wish to volunteer for this project. It will help you to understand what the study is about and what will happen during the project.

If you have questions at any time during the project, you should feel free to ask them and should expect to be given answers that you understand entirely.

After all your questions have been answered, you may complete the attached survey and participate in the educational session if you still wish to participate in the project. You are not giving up any of your legal rights by volunteering for this research project.

Why is this project being done?

This project aims to address the lack assessing patients in the primary care setting who are at risk for sexually transmitted Infections (STIs). Syphilis is an STI that can be screened in most healthcare settings. Primary care providers are essential in initiating and testing their patients for syphilis who otherwise may not be aware or seek adequate care. Lack of guidelines and assessment tools in the primary care setting often leads to missed opportunities to diagnose and treat certain diseases. This project plans to improve primary care provider screening for syphilis and increase testing during the clinic visit. This study also plans to improve the patient awareness of syphilis and other STDs screening and recommended testing to help prevent exposure to other individuals in the community. The study will be run for eight weeks with an estimate of two providers and one nurse participant involved.

What will you be asked to do if you take part in this research project?

The P.I. will survey the total number of patient visits and syphilis diagnosis codes recorded 8 weeks before implementing a Syphilis Assessment Tool intervention. The educational session of how to implement the intervention will be provided to the providers and nurse in the primary care physician's office and last approximately 30 minutes during your lunch break. A second survey will be completed two weeks after the intervention has been implemented.

What are the risks or discomforts you might experience if you take part in this project?

No expected harm can occur from participating in this study. This project has no influence or involvement from the state or other outside establishment, and participation is voluntary. The State of Mississippi will be excused from participation and not provided any information regarding survey results or provider participation in this project.

Participation in this project is of no cost to you.

How will information about you be kept private or confidential?

All efforts will be made to keep your personal information in your research record confidential, but total confidentiality cannot be guaranteed. Only a randomized I.D. code will be placed on your survey without the addition of any other personal identifiers. Surveys will remain within the medical nursing unit, and information will not be removed from the premises until all identifiable information is removed.

What will happen if you do not wish to participate in the project or if you later decide not to stay in the project?

Participation in this project is voluntary. Suppose you do not want to enter the project or decide to stop participating. You may choose not to participate, or you may change your mind at any time. In that case, your relationship with the study staff will not change, and you may do so without penalty and without loss of benefits to which you are otherwise entitled.

You may also withdraw your consent to use data already collected about you, but you must do this in writing to Valeria Wiggins at vwiggins1@stu.jsu.edu.


Who can you call if you have any questions?

If you have any questions about taking part in this project, you can call the principal investigator:

Valeria Wiggins, MSN, RN
A DNP Student, Jacksonville State University
(205) 792-2495

Appendix G

CITI Training Certificate



Completion Date 26-Sep-2021
Expiration Date 25-Sep-2024
Record ID 45281158

This is to certify that:

Valeria Wiggins

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.

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w6d040d9f-3ddb-4004-b30b-f75daec60f70-45281158

Appendix H

IRB Approval



Institutional Review Board for the Protection of Human Subjects in Research
203 Angle Hall
700 Pelham Road North
Jacksonville, AL 36265-1602

December 8, 2021

Valeria Wiggins
Jacksonville State University
Jacksonville, AL 36265

Dear Valeria:

Your protocol for the project titled "Implementation and Evaluation of a Syphilis Screening Tool to Increase the Number of Patient Testing for Syphilis Among Adults 18 Years or Older in a Rural Primary Care Clinic 12082021-10 has been granted exemption 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 "Lynn Garner". The signature is fluid and cursive.

Lynn Garner
Associate Human Protections Administrator, Institutional Review Board

Appendix I**Budget**

Item	Budget	Actual Cost
Printed Materials	\$100.00	\$65.00
Secure Storage	\$100.00	\$50.00
Travel	\$100.00	\$300.00
Refreshments	\$100.00	\$50.00
Final Bound Copy of Project Manuscript	\$200.00	\$0
Total Cost:	\$600	\$465