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## **Assessment to Evaluate Knowledge of Chlamydia and Gonorrhea Diagnoses After Education**

Diane Lazarus Van

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ASSESSMENT TO EVALUATE KNOWLEDGE OF CHLAMYDIA AND  
GONORRHEA DIAGNOSES AFTER EDUCATION

by

Diane Lazarus Van

A Doctoral Project  
Submitted to the Graduate School,  
the College of Nursing and Health Professions  
and the School of Leadership and Advanced Nursing Practice  
at The University of Southern Mississippi  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Nursing Practice

Approved by:

Dr. Cathy Hughes, Committee Chair  
Dr. Lisa Morgan, Committee Member

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## ABSTRACT

Sexually transmitted infections (STIs) are a common issue among sexually active Americans. In 2018, 1,758,668 cases of chlamydia and 583,405 cases of gonorrhea were reported in the United States (Centers for Disease Control, 2018). Women aged 15-24 years old make up 44% of the reported cases of chlamydia in the United States (CDC, 2018). This age group is also at the greatest risk of complications from the disease such as fertility issues, pelvic inflammatory disease (PID), and ectopic pregnancy (CDC, 2018). Of the CDC's reported instances of STIs, 2,086 cases of chlamydia, and 583,405 cases of gonorrhea were in Mississippi. Education is vital to reducing the number of cases of these infections in our state (CDC, 2018).

Five women were diagnosed with chlamydia and/or gonorrhea during the three-week testing period. The women who participated in this project showed an increased level of knowledge regarding chlamydia and gonorrhea. The number of questions answered correctly on the post-test survey increased by 22.2% to 36.9% when compared to all five women's pre-test surveys. They also displayed an increased level of confidence regarding their knowledge of chlamydia and gonorrhea based on their pre-test and post-test scores. Using a specific tool to guide the education of women diagnosed with chlamydia and/or gonorrhea was beneficial in increasing the patients' knowledge. Educating these women increased their knowledge and perception of their knowledge.

## ACKNOWLEDGMENTS

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To my husband, Justin, thank you for loving me for the past 13 years and giving me your support to follow my dreams.

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To my extended family and friends- thank you for being so patient and understanding during this season of my life. Thank you for finding every reason to celebrate. I love you more than words can say.

To Miranda and Amber, I would not have been able to continue school after the loss of Delia without both of you walking beside me. The two of you have helped me more than you could know.

Thanks be to God, whose abundant grace has brought me this far.  
“More than that, we rejoice in our sufferings, knowing suffering produces endurance.”

~Romans 5:3

## DEDICATION

I dedicate the culmination of this work to the memory of my daughter, Delia Catherine Van who was born sleeping on July 6, 2019.

## TABLE OF CONTENTS

ABSTRACT .....	ii
ACKNOWLEDGMENTS .....	iii
DEDICATION .....	iv
LIST OF ABBREVIATIONS.....	ix
CHAPTER I - INTRODUCTION .....	1
Background.....	1
Significance.....	1
Problem Description .....	2
PICOT .....	2
Purpose of the Project .....	2
Needs Assessment.....	3
Synthesis of Evidence .....	3
Key Word Search.....	4
Available Knowledge.....	4
Prevalence .....	5
Education .....	5
Rationale .....	8
Theoretical Framework.....	8
Specific Aims.....	8

DNP Essentials.....	9
Summary .....	9
CHAPTER II – METHODOLOGY .....	10
Context.....	10
Population and Sample .....	10
Setting .....	10
Recruitment Methods.....	11
Project Design.....	11
Intervention .....	12
Evaluation .....	15
Tools Used .....	15
American College of Obstetrics and Gynecology: Chlamydia, Gonorrhea, and Syphilis .....	15
Awareness Assessment .....	16
Statistical Analysis.....	16
Letter of Consent.....	17
Ethical Considerations .....	17
Implications.....	17
Timeline of Project .....	18
Summary .....	18

CHAPTER III - RESULTS.....	20
Overview.....	20
Summary.....	22
CHAPTER IV – DISCUSSION.....	23
Limitations.....	23
Lessons Learned.....	23
Conclusion.....	23
APPENDIX A – Letter of Consent.....	25
APPENDIX B – ACOG Pamphlet.....	26
APPENDIX C – Awareness Assessment.....	28
APPENDIX D – IRB Approval Letter.....	31
REFERENCES.....	32

## LIST OF ILLUSTRATIONS

Figure 1. Comparisons of Questions Answered Correctly on Pre-Test versus Post-Test 21

## LIST OF ABBREVIATIONS

<i>USM</i>	The University of Southern Mississippi
<i>STI</i>	Sexually Transmitted Infection
<i>STD</i>	Sexually Transmitted Disease
<i>CDC</i>	Centers for Disease Control
<i>PID</i>	Pelvic Inflammatory Disease
<i>ACOG</i>	American College of Obstetrics and Gynecology
<i>OBGYN</i>	Obstetrics and Gynecology
<i>HIV</i>	Human Immunodeficiency Virus
<i>DNP</i>	Doctor of Nursing Practice
<i>THMS</i>	Teen Health Mississippi
<i>IRB</i>	Institutional Review Board
<i>HIPAA</i>	Health Insurance Portability and Accountability Act
<i>HPV</i>	Human Papilloma Virus

## CHAPTER I - INTRODUCTION

Little evidence exists on the education of adult women diagnosed with chlamydia and/or gonorrhea. As evidence suggests, Mississippi has a high rate of sexually transmitted infections (STI) but offers little education of these infections through public education. Once a woman has been treated for an STI there is no evidence to determine whether she will understand how to prevent reinfection in the future. Evaluation of education is necessary to prevent reinfection.

### Background

Pike County Mississippi is an underserved, undereducated community. According to Data USA, in 2018 the median household income for Pike County, Mississippi was \$29,489, far less than the national average household income of \$61,937 (Data USA, 2018). According to the U. S. Census Bureau, in 2018, only 30.7% of the population aged 18-24 in Pike County had their high school diploma or equivalent.

### Significance

According to Data USA (2018), Law HB494 requires schools in Mississippi to include either *abstinence-only* or *abstinence-plus* sex education programs in public schools. These programs are implemented in either sophomore or junior year. The local city school offers *abstinence-plus*, while both county public high schools teach *abstinence-only* and the private school in Pike County has no form of sex education whatsoever. These questions were asked to determine the needs of the population that attends this clinic and to assess their knowledge of sexually transmitted infections.

## Problem Description

Based on the fact that local high schools offer only *abstinence* or *abstinence-plus* sex education programs indicates that many area high school students are undereducated about sexually transmitted diseases. The project method utilizes the American College of Obstetrics and Gynecology's (ACOG, 2013) educational handout on chlamydia, gonorrhea, and syphilis could help guide the conversation between the nurse and the patient to ensure that the patient truly understands their diagnosis. The researcher's mission is to demonstrate that education was impactful by showing an increase in correct answers on the survey after the patients have been educated using the handout.

## PICOT

For women diagnosed with chlamydia and/or gonorrhea (P), does providing education using the American College of Obstetrics and Gynecology (2013) educational handout on *Chlamydia, Gonorrhea, and Syphilis* (I) versus no education (C) increase their knowledge of their of their diagnosis (O) three to four weeks later at their test of cure (T)?

## Purpose of the Project

Educating women diagnosed with chlamydia and gonorrhea will better help them understand their diagnosis and treatment as well as how to prevent the spread of these diseases and when to be tested in the future if need be. Supplementing the lack of education for this underserved community was the major goal of this project. It is hoped that the rates of these STIs will decrease in this area.

## Needs Assessment

Pike county is comprised of 39,563 people. This area has a high rate of chlamydia and gonorrhea infections according to the Mississippi Department of Health (2018) on Teen Health Mississippi's website, in 2018 Pike county reported 740.6 cases of chlamydia per 1,000 residents and 371.6 cases of gonorrhea per 1,000 residents (THMS). According to the OBGYN clinic, in March of 2020, the clinic performed 146 gonorrhea tests and 148 chlamydia tests. Ten women tested positive for gonorrhea, and eight women tested positive for chlamydia. The women were treated, and all eighteen patients returned in April for their test of cure appointments. At that time, all of the patients' tests of cure for chlamydia and gonorrhea were negative. While all patients were confirmed as cured, no evidence exists to determine whether or not the women understood how they contracted their infections and if they understood how to prevent re-infection. Providing education and then following up on that education can promote wellness in the community and decrease the spread of these STIs.

## Synthesis of Evidence

Evidence supports that education in many settings increases knowledge of chlamydia and gonorrhea diagnoses. Through searching, CINAHL, Cochrane Library, Google Scholar databases as well as the American College of Obstetrics and Gynecology's (ACOG, 2020) website, literature was found to support this theory. One problem the researcher faced is a lack of literature pertaining to the use of a knowledge assessment tool in evaluating education pre and post STI treatment.

### *Key Word Search*

Using The University of Southern Mississippi's Library website, a search was conducted in the CINAHL, database using keywords such as *chlamydia*, *gonorrhea*, and *education*. The initial keyword search resulted in 233 articles. The search was then narrowed by year; the search dates ranged from 1986-2019 to 2014-2019. Only full-text articles were shown. Only 27 articles remained. Articles that were based on populations in Africa were excluded since this project examined women in Southwest Mississippi where socioeconomic and educational factors are different. Any data for men that appeared were also excluded, as this population is entirely female. A search of the Cochrane Library for *chlamydia education* yielded 40 results. Of those 40 results, three pertained to women and education and were used for the purpose of this project. A search of *chlamydia-gonorrhea education* on Google Scholar yielded 6,900 results. The American College of Obstetrics and Gynecology (ACOG, 2020) website was also searched using the keywords *chlamydia* and *gonorrhea*. Seven articles remained that pertained to the topic.

### *Available Knowledge*

After many searches, only seven articles remained that pertained to women who were diagnosed with chlamydia and/or gonorrhea. Little evidence on the education of post-high school age women in America exists. Many studies combined men and women or catered to women in third world countries. Evidence existed on women with Human Immunodeficiency Virus (HIV), but little was found pertaining to other STIs.

### *Prevalence*

According to Flagler et al. (2017), 21-25 year old women have the highest rate of chlamydia infections (2017). The study compared multiple STIs in women of multiple age groups. Flagler et al. (2017) found that 4.2% of the 21-25 year-old population tested positive for chlamydia, while 2.7% of the 14-20 year old age group tested positive for chlamydia.

Gaydos et al. (2009) performed a study that involved women using at-home vaginal swabs and found that younger women were at an increased risk of contracting chlamydia. The authors discovered that out of the population tested, more than 77% of the women who tested positive for chlamydia were 30 years old or younger (Gaydos et al., 2009). This study was included recognizing the year of publication because the authors addressed at-home testing, on which very little evidence exists.

According to an opinion published on the American College of Obstetrics and Gynecology's website, "Adolescents and young adults may engage in noncoital sex in order to avoid pregnancy or sexually transmitted infections" (ACOG, 2013, p.1). The prevalence of infections in the teen and young adult age group is once again brought to light. Noncoital sex is defined by ACOG (2013) as oral sex, manual manipulation, and the sharing of sex toys.

### *Education*

Phillipson et al. (2016) found that education within a *clinic* setting was more effective compared to *social marketing* education. The study compared *in-clinic* education to education that takes place outside of an actual medical clinic as in a documentary on television or education in a school setting. The authors of this study also

found that a formal risk assessment led to a higher likelihood of testing in some higher-risk groups.

Before education can begin, patients must agree to be tested. Town et al. (2016) examined the use of the *3 Cs and HIV* in order to increase testing rates in their study. The *3 Cs* are chlamydia, condom use, and contraception. Despite the staff finding this tool useful and concluding that the tool increased their likelihood to offer testing to their patients, no evidence suggested that the use of this tool increased testing rates.

To be able to evaluate education, patients must return for their follow-up testing. One study from the United Kingdom determined that only 13.7% of patients who tested positive for chlamydia, returned for repeat testing (Visser et al., 2017). This study included males and females, whereas this project looks only at females. The authors of this report state that women (38%) were more likely to return for repeat testing than men were (22%).

An official recommendation statement from The U.S. Preventative Services Task Force (USPSTF, 2008) found that education played a significant role in the reduction of STI occurrences. After six trials of different educational interventions, the researchers found that “Five of 6 trials demonstrated statistically significant reductions in biologically confirmed STIs at 6 and 12 months after the interventions” (USPSTF, 2008, p. 4). This study has become the *gold standard* in STI prevention through educational counseling.

As mentioned previously, a gap in available knowledge regarding the effectiveness of STI education of women in America is prevalent. Many articles exist on the education of women (and men) with HIV, but not as much evidence could be found

on the education of women with chlamydia and/or gonorrhea. All available literature had been presented to the best of the researcher's ability.

## Rationale

### *Theoretical Framework*

The theory that most aligns with this project is that of Lydia Hall's Care, Core, and Cure Model. Hall sees three distinct aspects of healing: the core (or patient), the care, and the cure, (Zaccagnini & White, 2017). According to Zaccagnini and White, this model states that while the nurse comforts the patient he or she "...also engenders learning, growth, and healing" (2017, p. 19). Through education, this project assesses the knowledge of patients so that the women involved may grow individually and take the responsibility of their health into their own hands. Zaccagnini and White claim that the nurse's job is not done once the patient has stabilized, that education and nurturing are equally as important for the patient as physical healing. The project identifies which patients (core) will benefit from this education implementation. The researcher will re-evaluate their status with a follow-up survey at their test of cure.

### Specific Aims

According to The U.S. Census Bureau (2018), less than 31% of Pike County residents between the ages of 18-24 hold a high school diploma or equivalent. Even residents who did graduate may not have ever had a proper sex education class since many of the area's schools teach *abstinence-only*. Based on these facts, the assumption can be made that knowledge regarding the contraction, transmission, and treatment of sexually transmitted infections is not well understood for patients in this area. This project addresses the need to increase the knowledge of the women diagnosed with chlamydia and/or gonorrhea on how the disease is contracted, transmitted, and treated with the hope that this education will prevent reinfection in the future.

## DNP Essentials

Four Doctor of Nursing Practice (DNP) Essentials (DeCapua, 2017) align with this project. DNP Essentials II, III, VI, and VII outline the goals of the project. According to DeCapua (2017) in *The Essentials of the DNP Program*, these four principles are as follows: II: Organizational and Systems Leadership for Quality Improvement, III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice, VI: Inter-Professional Collaboration for Improving Patient and Population Health Outcomes, and VII: Clinical Prevention and Population Health for the Nation's Health. This project aids by, "...evaluating, translating, and disseminating research into practice" (2017), as outlined in the second DNP essential. Sexually transmitted infections are a "...complex issue facing modern healthcare" (DeCapua, 2017, n.p.) that this project will address, thus addressing the third DNP Essential. By working closely with lab technicians, nurses, nurse practitioners, and doctors, through this project, the DNP researcher meets the criteria for DNP Essential VI. Lastly, through the education of patients, this project aims to address DNP Essential VII to improve the health of this rural population.

## Summary

Education is empowering. This project evaluates the effectiveness of education of women who have chlamydia and/or gonorrhea in rural Mississippi. Education will be provided upon receiving their test results and then evaluated at the time of diagnosis four weeks later when a patient receives their test of cure. Through re-administering a survey given at the time of the original testing, the effectiveness of the educational intervention can be evaluated.

## CHAPTER II – METHODOLOGY

### Context

Using the American College of Obstetrics and Gynecology's handout on chlamydia, gonorrhea, and syphilis (Appendix B), women seeking treatment for sexually transmitted infections were educated on how they contracted their STI, how to treat the STI, and how to prevent contracting the STI in the future. Women in this geographical area have had little to no high school education on sex education based on the *abstinence-only* or *abstinence-plus* sex education programs in local public high schools. This educational handout was used to fill the educational gap that these patients may need.

### Population and Sample

According to the Mississippi Department of Health (2018) on Teen Health Mississippi's (THM) website, in 2018 Pike county reported 740.6 cases of chlamydia per 1,000 residents and 371.6 cases of gonorrhea per 1,000 residents (THM, 2018). The population of this project was all women over the age of 18 in Pike county. The sample was the women who visit the OBGYN clinic for STI testing. This was a convenience sample. Women who visited the OBGYN Clinic had to meet the inclusion criteria to be involved in this project. Inclusion criteria were as follows: participants must be women who are English speaking, 18 years old or older and are getting tested for chlamydia and/or gonorrhea during their visit.

### Setting

The obstetrics and gynecology Clinic is a women's health clinic offering services to women of child-bearing age and beyond. Some of these services include family planning counseling; birth control options; breast, cervical, and vaginal exams;

ultrasounds; mammogram scheduling and follow-up; laboratory blood testing, STD testing, Pap smears, bone density scans, etc. The clinic, located in Southwest Mississippi, serves multiple surrounding areas. This clinic is one of two obstetrics and gynecology clinics in this town.

Five women comprise the front or administrative office staff. One medical doctor and one nurse practitioner are in practice at the clinic, currently. Four licensed practical nurses work for the two providers. One sonographer and two lab technicians are also employed at the clinic. The clinic is open Monday through Thursday from 8 a.m. to 5 p.m. and a nurse is available to answer the phone and make calls to patients on Fridays.

#### Recruitment Methods

Each patient aged 18 and older visiting the clinic for STI testing was identified by one of the four nurses at the office. Once these potential candidates were identified, a nurse asked the women if they would agree to participate in this study by answering the simple, fourteen-question survey on their phone or paper, if they do not have a smartphone. After the women verbally agreed, they were directed to the QR visible in the exam room. If the participant did not have a smartphone, they were given a paper consent form (Appendix A). Once the women signed the consent either on paper or via the online survey, they were directed to the rest of the survey or “knowledge assessment” (Appendix C), whether paper or online. Any woman who did not wish to fill out the survey was not included in the project.

#### *Project Design*

The DNP researcher designed a fourteen-question knowledge assessment given to all consenting patients receiving STI testing at the OBGYN Clinic. The patients were

presented with the opportunity to take the survey using a QR code on their smartphone, or a paper copy was provided to them if they did not have a smartphone. Any patient with a positive chlamydia and/or gonorrhea result was called and educated using the American College of Obstetrics and Gynecology *Gonorrhea, Chlamydia, and Syphilis* educational handout (Appendix B) 24 to 48 business hours after testing. Patients who tested positive for chlamydia and/or gonorrhea were treated and made an appointment for their test of cure three to four weeks after treatment. At the test of cure appointments, the survey was re-administered using the QR code on their smartphone or paper to reassess each patient's knowledge.

### *Intervention*

This project was carried out at an OBGYN Clinic in Southwest Mississippi. The DNP researcher designed a fourteen-question knowledge assessment given to all consenting patients aged 18 and older receiving STI testing at the OBGYN Clinic. Any patients with a positive chlamydia and/or gonorrhea result were called and educated using the American College of Obstetrics and Gynecology "Gonorrhea, Chlamydia, and Syphilis" educational handout 24 to 48 business hours after testing. At the OBGYN clinic, one of the four nurses went into patients' exam rooms, took their vital signs, and obtained a brief history. Patients who planned to have the chlamydia and gonorrhea tests performed that day were asked by the nurse if they had seen the information about the project in the lobby and if they were interested in participating. The patients who indicated interest were then provided with the consent and knowledge assessment either on paper or directed to the QR code posted in each exam room.

The participants filled out this short survey in their exam room while they waited on their provider to come in for their appointment. The surveys were only available in English, thus excluding any non-English speaking women from participating in the project. All participants were able to read, however, the researcher had planned that if a participant could not read, but would like to fill out a survey, an oral announcement would have been made, meaning the consent form and knowledge assessment questions would have been read aloud to them so that they would have the opportunity to participate.

Any patients not receiving any STI testing were not offered a survey. If a patient was unsure whether they were having testing done, they were offered the virtual or paper survey just in case the provider did test them for STIs during their exam. The announcement explained that if the patient were to receive a positive result, the researcher would call them with that result. As is standard practice at the clinic currently, one of the clinic nurses calls patients with positive test results. During the phone call, the DNP researcher provided the patient with an education based on handouts from the American College of Obstetrics and Gynecology. If the patient's test was negative, no call was made and therefore no education took place.

All patients who test positive for chlamydia and/or gonorrhea are reported to the Mississippi State Department of Health as a part of the mandatory reporting protocol in the Mississippi. According to the Mississippi Department of Health (2017), chlamydia and gonorrhea fall into category 2 of reportable diseases meaning they must be reported by mail, telephone, or fax within one week of diagnosis. The patients who tested positive for chlamydia were called in a one-time dose of Zithromax (one gram) to the pharmacy

of their choosing. Patients who tested positive for gonorrhea (or chlamydia and gonorrhea) also had a one-time dose of Zithromax™ (one gram) called into their pharmacy and were asked to come into the clinic in the next five business days to receive an injection of Rocephin™ (250 milligrams). All patients who tested positive for one or both infections were asked for their partner information, as required by the Mississippi Department of Health (2017) for mandatory reporting. The providers at the clinic called in a prescription for Zithromax™ for the partners with either infection, but if the patient had gonorrhea, the partner had to see his or her provider or go to the local health department for the Rocephin™ injection. Two of the STI positive patients provided partner information. Two agreed to have their partner be seen at the local health department.

After treatment, all participants were scheduled to return to the clinic in three to four weeks for a test of cure. All five participants were seen for their test of cure by late September. Clinic protocol states that patients who do not show up for this appointment are called and sent a letter. After two attempts to bring the patient back in with no success, the clinic sends a certified letter. A clinic staff member reported that patients not returning for a test of cure is currently a rare problem. Since all patients returned to the clinic, no further action was required for this project.

When the participants returned to the clinic for their test of cure, the survey was re-administered using the QR code or paper to assess for increased knowledge. There were five positive STI results. Three patients tested positive for chlamydia, one tested positive for gonorrhea, and one tested positive for both. All education was performed over the phone.

All paper surveys were kept at the clinic in the office manager's office, in a lockbox to keep patient documents that are in accordance with the American Health Insurance Portability and Accountability Act (USDHHS, 2019). Only the principal researcher and office manager had access to this lockbox. The surveys were then collected by the researcher.

### *Evaluation*

The number of women who participated in the project with positive chlamydia and or gonorrhea tests was assessed over three weeks. During the first week, two women tested positive for chlamydia and one woman tested positive for gonorrhea. During the second week, one woman tested positive for chlamydia and one woman tested positive for both chlamydia and gonorrhea. No women tested positive for either STI during the third week.

By the final week of September, all five participants have been seen for their test of cure. Patients who do not show up for this appointment are called and sent a letter. After two attempts to bring the patient back in with no success, the clinic sends a certified letter. The nurse manager of the clinic reports that patients not returning for a test of cure is currently a rare problem.

### Tools Used

#### *American College of Obstetrics and Gynecology: Chlamydia, Gonorrhea, and Syphilis*

The American College of Obstetrics and Gynecology educational handout of Chlamydia, Gonorrhea, and Syphilis (ACOG, 2013) (Appendix B) was used for the education of patients with a positive chlamydia and/or gonorrhea result. All patients who tested positive for chlamydia and/or gonorrhea were called and educated. This handout

guided the researcher to educate each patient on symptoms, treatment, condom use, and prevention of STIs.

#### Awareness Assessment

The Awareness Assessment (Appendix C) is the fourteen-question survey that was given to all patients receiving STI screening at the clinic that was re-administered to any patients with chlamydia and/or gonorrhea at their test of cure. The survey was made by the DNP researcher, using the Centers for Disease Control and Prevention as a resource, among other resources listed. At their initial visit, when STI testing was performed, a coding system for the surveys was used to keep patient identities secure. This system involved using letters and numbers to organize surveys. Patients were asked to write/type the date, their age, and their six-character code on the pre and post-tests. No one but the researcher had access to these surveys. Once the test results were received, the researcher made a list of positive patient codes. The Awareness Assessment was re-administered at the patient's test of cure appointments to compare to the patient's pre-test answers. The same coding system applied for the re-administration of the surveys at the test of cure appointments. Again the participants were asked to write/type the date, their age, and their six-character code on their post-test survey.

#### Statistical Analysis

This project is a descriptive study. Individual participants answered a pre-test survey and then were re-administered the same survey if they have a positive STI result. The researcher compared data individually, meaning that participants' initial surveys were compared to their surveys at their test of cure instead of group comparisons. The number of correct responses on their test of cure surveys was compared to the number of

correct responses on their initial surveys to measure the effectiveness of the educational handout.

#### Letter of Consent

Each patient was asked to sign a letter of consent (Appendix A) before participating in the project. Patients using the QR code to access the survey consented by answering the first question on the electronic survey. The letter of consent describes the project, gives the contact information of the DNP researcher and faculty chair, and explains that involvement in the project is voluntary and confidential. If a patient was unwilling to sign this letter of consent, they were excluded from participating in the project.

#### Ethical Considerations

A letter of support from the facility was obtained from the clinic. Approval from The University of Southern Mississippi's Institutional Review Board was also obtained (IRB Protocol # 20-362). Each patient involved with the project was asked to sign on paper or electronically, a form of consent before participating in the project. Each participant was assured that their private health information would not be shared, in accordance with the Health Insurance Portability and Accountability Act (HIPAA) of 1996 (USDHHS, 2019). The participants were also informed that the surveys would have the date and the patient's self-assigned code but would have no identifying information on them.

#### Implications

The obstetrics and gynecology clinic occasionally gives patients the American College of Obstetrics and Gynecology (ACOG) educational handout on chlamydia,

gonorrhea, and syphilis to educate patients. The nurses who call patients with their test results currently rely on their knowledge to educate patients on their test results. This project incorporated the nurses' knowledge while also using the ACOG handout (Appendix B) as a guide. The goal of this project was to determine whether using this educational handout increases patients' knowledge of chlamydia and gonorrhea after education and treatment. If the patients scored higher on the post-education assessment, nurses would know to always use this handout as a resource when calling patients with a positive chlamydia and/or gonorrhea result.

#### Timeline of Project

This project was proposed on Tuesday, June 23, 2020. Institutional Review Board (IRB) approval was granted Friday, August 21, 2020. Testing began Monday, August 25, 2020 (IRB-20-362). Testing continued for three weeks. Test of cure appointments began three weeks after initial tests. The first week of testing yielding two positive chlamydia results and one positive gonorrhea result. The second week of testing yielded one positive chlamydia result and one patient positive for both chlamydia and gonorrhea. Tests of cure began on September 17, 2020, and were completed by September 23, 2020.

#### Summary

With high rates of chlamydia and gonorrhea in a county known to provide very little sex education through public education, the need is apparent for education on sexually transmitted infections. By using the American College of Obstetrics and Gynecology educational handout on chlamydia, gonorrhea, and syphilis, nurses at the obstetrics and gynecology clinic can give their patients a better understanding of how

chlamydia and gonorrhea are contracted, treated, and prevented. Patients should see an increase in their knowledge through the use of a survey pre and post-education.

## CHAPTER III - RESULTS

This project examined the effectiveness of the education provided to women who tested positive for chlamydia and/or gonorrhea. A total of 27 women participated in the survey. Each participant was given a survey to complete before diagnosis upon an initial visit to the clinic. Their chlamydia and gonorrhea test results were obtained two to three days after testing. Once these results were obtained by the researcher, the researcher called to inform participants of their diagnosis and provided the participants with education on their diagnosis. Treatment was prescribed by one of the two providers and sent to the pharmacy of each patient's choosing. The participants were also offered treatment for their partner. Upon return to the clinic for a test of cure three to four weeks later, the participants were given the same survey and their responses were compared to their original survey. Of the 27 participants, 5 tested positive for STIs. During the first week of testing, two women tested positive for chlamydia and one woman tested positive for gonorrhea. During the second week of testing, one woman tested positive for chlamydia and one woman tested positive for both chlamydia and gonorrhea. No women tested positive for either STI during the third week.

### Overview

Over the three week pre-test period, 27 women participated in the study. Thirteen women participated in the survey online for the project. Fourteen women filled out the survey for the project on paper in the clinic. During the three week testing period, five women were diagnosed with chlamydia, one woman was diagnosed with gonorrhea, and one woman was diagnosed with both. Upon completion of the post-tests, evidence that the participants had gained some knowledge of STIs was apparent. One woman answered

six questions incorrectly on the pre-test and answered two questions incorrectly on the post-test. Two women answered two questions incorrectly on the pre-test and no questions incorrectly on the post-test. One woman answered three questions incorrectly on the pre-test, and one question incorrectly on the post-test. One woman answered four questions incorrectly on the pre-test and one question incorrectly on the post-test.

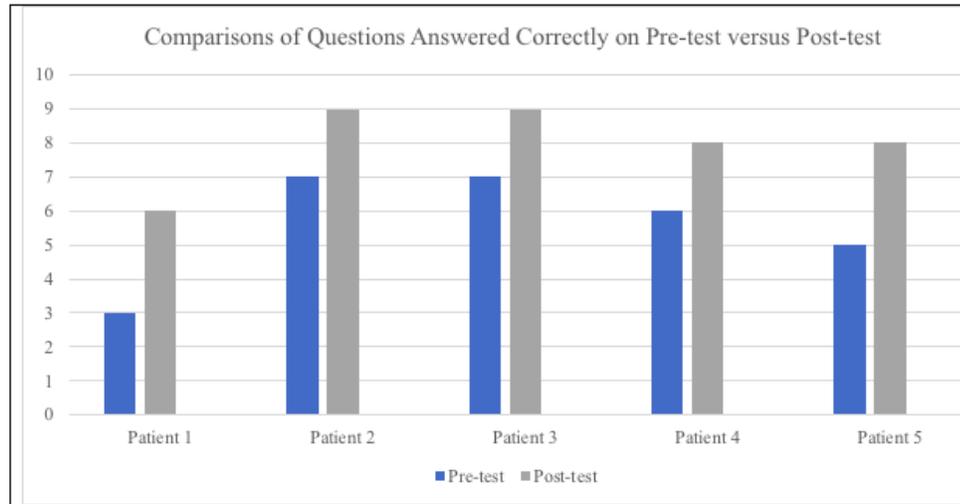


Figure 1. *Comparisons of Questions Answered Correctly on Pre-Test versus Post-Test*

All five women felt that they knew more about chlamydia and gonorrhea on the post-test compared to their pre-test. The final question on the survey asked, *How would you rate your knowledge about chlamydia and gonorrhea currently?* The response choices are as follows:

- A. I've never even heard of them.
- B. I have heard of one or both of them, but don't know much about them.
- C. I am pretty familiar with both of these diagnoses.
- D. I have a good deal of knowledge regarding these diagnoses.

Four women chose, *I have heard of one or both of them, but don't know much about them* on their pre-tests and answered, *I am pretty familiar with both of these diagnoses* on their post-tests, which occurred after education. One woman chose, *I am pretty familiar with both of these diagnoses* on her pre-test and chose, *I have a good deal of knowledge regarding these diagnoses* on her post-test. All five women indicated that they felt more confident in their knowledge of STIs.

### Summary

The 27 women who participated in the project showed an increase in knowledge about STIs based on their survey scores. Each woman's score improved after education. Post-test scores increased between 22.2% to 36.9% compared to the pre-education or pre-test scores. Based on survey responses, the women's confidence in their knowledge also improved after education.

## CHAPTER IV – DISCUSSION

This project yielded positive results but was not without limitations. The researcher concluded that the women felt an increase in knowledge of chlamydia and gonorrhea, and this increase in knowledge was reflected in their post-test scores. However, many women were not reached due to their age or their specific type of STI.

### Limitations

The COVID-19 pandemic likely limited the number of women who reported to the clinic for their yearly wellness. The clinic manager reported seeing a spike of patients in late May and early August (as she does each year before school starts) and then a decline in patients during late August and early September. A few women under the age of 18 tested positive for chlamydia and/or gonorrhea during the three-week testing period, but were excluded from the project due to age.

### Lessons Learned

More women could be reached if more STIs were included in education. Many patients with trichomonas infections, bacterial vaginosis, and human papillomavirus (HPV) were seen during the three week testing period. One patient tested positive for syphilis. Often, these problems were diagnosed and treated in the initial visit, so there was no time to pre-test, call, educate, and post-test, but these patients could certainly benefit from additional education on STIs upon the initial visit.

### Conclusion

Women who participated in this project showed an increased level of knowledge regarding chlamydia and gonorrhea. The participants also displayed an increased level of confidence regarding their knowledge of chlamydia and gonorrhea based on their pre-test

and post-test scores. Using a specific tool to guide the education of women diagnosed with chlamydia and/or gonorrhea was beneficial in increasing the patients' knowledge. Educating these women increased their knowledge and perception of their knowledge.

## APPENDIX A – Letter of Consent

### Consent for Participation

My name is Diane Lazarus Van and I am doctoral student in The University of Southern Mississippi's Family Nurse Practitioner Doctor of Nursing Practice program. As a part of my academic requirements, I am conducting an evidence-based practice project entitled Education Assessment to Increase Knowledge of Chlamydia and Gonorrhea Diagnoses. This study will use a survey design to investigate the knowledge of participants concerning sexually transmitted infections. Participation is voluntary and responses are anonymous.

Your participation in this study will include:

*If any education component or other parts, add as needed in the order for the project process.*

- (1) Completing a ten question questionnaire that would take 5 or fewer minutes to answer before being examined by the provider.
- (2) If you were to receive a positive chlamydia and gonorrhea result, after treatment, you would be asked to re-take the questionnaire.

All questionnaires will be locked in the main office of the clinic until all data is collected and then all questionnaires will be shredded.

You must be 18 years of age to participate.

Your participation is voluntary, you do not have to answer any questions you are uncomfortable with, and you can stop anytime.

There will be no compensation for participation or penalty for nonparticipation in this study.

All participant responses to the survey will remain confidential. Your answers will be used to provide insight on barriers, strengths, and opportunities related to the education of patients concerning sexually transmitted infections. The investigators on this evidence-based practice clinical inquiry involved with this study are myself and my Chair, Dr. Cathy Hughes. We will have access to the data. Data will be reported as group data. In any reports written about this study, no identifying information will be included. No individual responses will be reported. Participation in this study is strictly voluntary and completing the study survey indicates an agreement to participate in this study and that you are at least 18 year of age.

The principal investigator of this study is Diane Lazarus Van, and she can be contacted by email at [Lazarus\\_diane@yahoo.com](mailto:Lazarus_diane@yahoo.com) She is working with her advisor, Cathy Hughes who can be reached at [Cathy.Hughes@usm.edu](mailto:Cathy.Hughes@usm.edu). This project has the approval and support of the project committee.

This project has been reviewed by the University of Southern Mississippi's Institutional Review Board Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research subject should be directed to the chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, (601) 266-5997. The results of this study will be made available upon completion of the project

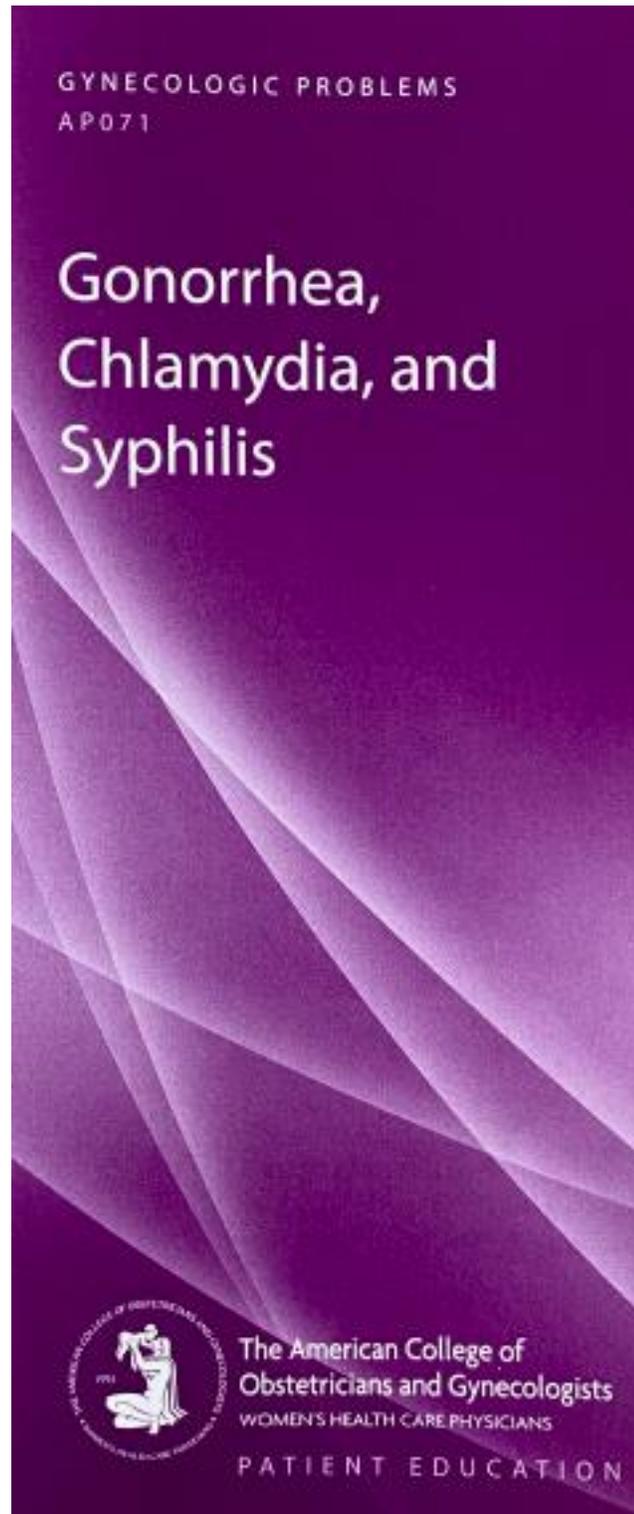
Thank you for consideration to participate in this study. Diane Lazarus Van

By signing here: \_\_\_\_\_ Participant's Signature for consent

\_\_\_\_\_ I confirm that I am 18 years of age or older.

\_\_\_\_\_ I agree to participate in this project. I understand that I may withdraw at any time.

APPENDIX B – ACOG Pamphlet



**G**onorrhea and chlamydia are two of the most common sexually transmitted diseases (STDs). Syphilis, another STD, was uncommon until 2001, when cases began to increase. These three STDs can cause serious, long-term problems if they are not treated, especially for teenagers and young women. It is important to learn how to recognize the signs and symptoms of these STDs and take steps to prevent them.

This pamphlet explains

- symptoms, diagnosis, and treatment of these STDs
- complications and health risks
- prevention

#### Sexually Transmitted Diseases

There are many STDs. This pamphlet focuses on gonorrhea, chlamydia, and syphilis. These STDs can cause long-term health problems and problems during pregnancy (see box "Problems During Pregnancy"). Having an STD also increases the risk of getting *human immunodeficiency virus (HIV)* if you are exposed to it.

#### Gonorrhea and Chlamydia

Gonorrhea and chlamydia often occur together. Both are caused by bacteria. The bacteria are passed from one person to another through vaginal, anal, or oral sex. Gonorrhea and chlamydia infections can occur in the mouth, reproductive organs, *urethra*, and rectum. In women, the most common place is the *cervix* (the opening of the *uterus*). Although gonorrhea and chlamydia can occur at any age, women 25 years and younger are at greater risk of both infections.

#### Problems During Pregnancy

During pregnancy, gonorrhea, chlamydia, and syphilis can be passed from mother to baby and may cause these complications:

- Preterm birth (birth before 37 weeks of pregnancy)
- Premature rupture of membranes (when the sac that surrounds the baby breaks before labor begins)
- Low birth weight (under 5 pounds)
- **Miscarriage**
- Eye infection in the baby, called conjunctivitis, which can lead to blindness
- Pneumonia
- Birth defects
- Death of the baby

Because of these risks, pregnant women are tested for syphilis and chlamydia. Pregnant women with risk factors and all pregnant teenagers also are tested for gonorrhea. If the mother is infected, she then can be treated during pregnancy.

#### Symptoms

Women with gonorrhea or chlamydia often have no symptoms. When symptoms from either infection do occur, they may show up 2 days to 3 weeks after infection. They may be very mild and can be mistaken for a urinary tract or vaginal infection. The most common symptoms in women include the following:

- A yellow vaginal discharge
- Painful or frequent urination
- Vaginal bleeding between periods
- Rectal bleeding, discharge, or pain

In men, the following symptoms are the most common:

- Discharge from the penis
- Pain and burning during urination
- Rectal bleeding, discharge, or pain

#### Diagnosis

To find out if you have gonorrhea or chlamydia, your health care provider may take a sample of cells from your throat, cervix, urethra, or rectum where the infection may occur. Gonorrhea and chlamydia also can be detected with a urine test.

#### Complications

Both gonorrhea and chlamydia can cause serious problems:

- **Pelvic inflammatory disease (PID)** is an infection that occurs when bacteria move from the vagina and cervix upward into the uterus, ovaries, or fallopian tubes. After a woman is infected with gonorrhea or chlamydia and if she does not receive treatment, it can take anywhere from a few days to a few weeks before she develops PID. PID may lead to long-term problems, such as *infertility*, if it is not treated. Symptoms may include chills, fever, and pelvic pain. Some women may not have symptoms until PID has been present for a while.
- **Ectopic pregnancy** can result from the scarring of the fallopian tubes caused by PID. Unless it is treated quickly, ectopic pregnancy may cause the fallopian tube to rupture (burst). A ruptured fallopian tube is a life-threatening emergency.

## APPENDIX C – Awareness Assessment

### Awareness Assessment

1. My name is Diane Lazarus Van and I am doctoral student in The University of Southern Mississippi's Family Nurse Practitioner Doctor of Nursing Practice program. As a part of my academic requirements, I am conducting an evidence-based practice project entitled Education Assessment to Increase Knowledge of Chlamydia and Gonorrhea Diagnoses. This study will use a survey design to investigate the knowledge of participants concerning sexually transmitted infections. Participation is voluntary and responses are anonymous.

Your participation in this study will include:

If any education component or other parts, add as needed in the order for the project process.

1) Completing a 14 question questionnaire that would take 5 or fewer minutes to answer before being examined by the provider.

(2) If you were to receive a positive chlamydia and gonorrhea result, after treatment, you would be asked to re-take the questionnaire.

All questionnaires will be locked in the main office of the clinic until all data is collected and then all questionnaires will be shredded.

You must be 18 years of age to participate.

Your participation is voluntary, you do not have to answer any questions you are uncomfortable with, and you can stop anytime.

There will be no compensation for participation or penalty for nonparticipation in this study.

All participant responses to the survey will remain confidential. Your answers will be used to provide insight on barriers, strengths, and opportunities related to the education of patients concerning sexually transmitted infections. The investigators on this evidence-based practice clinical inquiry involved with this study are myself and my Chair, Dr. Cathy Hughes. We will have access to the data. Data will be reported as group data. In any reports written about this study, no identifying information will be included. No individual responses will be reported. Participation in this study is strictly voluntary and completing the study survey indicates an agreement to participate in this study and that you are at least 18 year of age.

The principal investigator of this study is Diane Lazarus Van, and she can be contacted by email at [Lazarus\\_diane@yahoo.com](mailto:Lazarus_diane@yahoo.com) She is working with her advisor, Cathy Hughes who can be reached at [Cathy.Hughes@usm.edu](mailto:Cathy.Hughes@usm.edu). This project has the approval and support of the project committee.

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Thank you for consideration to participate in this study. Diane Lazarus Van

- a. I consent to participate in this survey
2. I am 18 years old or older.
  - a. Yes
3. Please enter today's date (MM/DD/YR)

4. Please enter your patient code (ex: ABC123)
5. Which of the following is not a sexually transmitted infection (STI)?
  - a. Herpes
  - b. Hepatitis A
  - c. Gonorrhea
  - d. Chlamydia
6. Which of the following is NOT a way an STI can be spread?
  - a. Oral sex
  - b. Anal sex
  - c. From a toilet set
  - d. Vaginal sex with a condom
7. TRUE or FALSE: Birth control protects me from STIs.
  - a. True
  - b. False
8. The best thing to do after being diagnosed with an STI is:
  - a. Take your antibiotics
  - b. Treat your partner(s)
  - c. Return for your follow up gynecologist appointments/test of cure
  - d. All of the above
9. TRUE or FALSE: Chlamydia often has no symptoms.
  - a. True
  - b. False
10. Is it important to be treated for chlamydia (and other STIs) because of an increased risk of:
  - a. Pelvic inflammatory disease
  - b. Ectopic pregnancies
  - c. Infertility
  - d. All of the above
11. What percentage of chlamydia is cured after a single dose of azithromycin (an antibiotic)? (CDC 2015).
  - a. 100%
  - b. 97%
  - c. 50%
  - d. 44%
12. What age group is most likely to be diagnosed with gonorrhea?
  - a. 15-24 years old
  - b. 25-34 years old
  - c. 35-44 years old
  - d. 45-54 years old
13. TRUE or FALSE: Having an untreated STI places you at a higher risk of acquiring another STI.
  - a. True

- b. False
14. How would you rate your knowledge about your chlamydia and gonorrhea currently?
- a. I've never even heard of either.
  - b. I have heard of one or both of them, but don't know much about them.
  - c. I am pretty familiar with both of these diagnoses.
  - d. I have a good deal of knowledge regarding this diagnoses.

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APPENDIX D – IRB Approval Letter

Office of  
Research Integrity



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**NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION**

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident template on Cayuse IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER: IRB-20-362

PROJECT TITLE: Assessment to Evaluate Knowledge of Chlamydia and Gonorrhea Diagnoses After Education

SCHOOL/PROGRAM: School of LANP

RESEARCHER(S): Diane Lazarus Van, Cathy Hughes

IRB COMMITTEE ACTION: Approved

CATEGORY: Expedited

7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

PERIOD OF APPROVAL: August 21, 2020

**Donald Sacco, Ph.D.**  
**Institutional Review Board Chairperson**

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