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This doctoral project, directed and approved by the candidate's committee, has been accepted by the College of Graduate and Professional Studies of Abilene Christian University in partial fulfillment of the requirements for the degree

Doctor of Nursing Practice



Dr. Joey Cope, Dean of the College of
Graduate and Professional Studies

10 / 23 / 2020

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Stroke Prevention in African American Women Ages 20-40 That are Using or Have Used Oral
Contraceptives

A doctoral project submitted in partial satisfaction
of the requirements for the degree of
Doctor of Nursing Practice

by

Ashanti L. N. Coleman

November 2020

Dedication

I would like to dedicate this research to all those that have been affected by stroke. I would also like to dedicate this to the American Heart and Stroke Association and any other organization helping to improve the incidence of stroke.

Acknowledgments

I would like to take the time to express my sincere thanks to all those involved directly and indirectly to my research project. I would first like to personally thank my cousin, Dr. Jerithea Tidwell, whose prayers, guidance, love, support, and mentoring helped me initiate my career in nursing and fostered me to build a passion for nursing while obtaining the highest level of educational attainment. Second, I would like to give much gratitude to my committee members, Dr. Sharisse Hebert, Dr. Tonya Sawyer-McGee, and Dr. Ugochi Irikannu, for taking on the task of overseeing my research project, guiding, and assisting me through this process. Third, I would like to thank Dr. Katosha Muse, Dr. Karen Green, and Crystal Shotwell FNP, for being so supportive and helpful in their knowledge of women's health and providing expert advice. I would also like to thank Dr. Jerrel Moore for his statistician expertise, brainstorming, and aiding in the development of this research. Next, I would like to express gratitude to Dr. Kelli Stidham Hall for allowing me the opportunity to utilize her oral contraceptive questionnaire. And a special thanks to my mentor, Dr. Lisa Beasley, for advising and guiding me through any obstacles I may have encountered during my research. My sister, Mankea Collier, MA, LCPC, for assisting in my research design. I am also very appreciative for all my friends and colleagues that encouraged me throughout. Last, I would like to thank my loving family, including my parents, siblings, cousins, aunts, and uncles. To my husband, I am so blessed to have you and our children in my life. Words cannot express how grateful I am for all your love, patience, encouragement, and understanding.

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Abstract

This Doctor of Nursing Practice project will inform the audience of stroke awareness as it pertains to oral contraceptives. The study's focus was to enhance the knowledge of African American women ages 20–40 that have used or are currently using an oral contraceptive. It has been identified that this patient population lacked the knowledge regarding stroke and oral contraceptives, and African American women continue to have the highest incidence of stroke. African American women also make up more than half of the consumers utilizing oral contraceptives. An oral contraceptive knowledge questionnaire was utilized from previous research to determine if any differences exist. A 16-question pre- and posttest was administered to participants and a brief Zoom educational session regarding oral contraceptive use, benefits, risks, and stroke risk factors and symptoms. There was a quantitative study used to ascertain participants' understanding of oral contraceptives and the effects of stroke. A Fisher's exact test was used to determine a real difference between the pre- and posttest scores. Despite most participants holding graduate degrees, the findings revealed a knowledge gap existed prior to holding the educational session. Overall, there was a positive effect noted because of the utilization of oral contraceptive and stroke education sessions. The most significant finding was an awareness of the risk of acquiring blood clots or stroke with oral contraceptive use.

Keywords: oral contraceptive, contraceptive knowledge, stroke, stroke prevention, African American women

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Chapter 1: Introduction

This Doctor of Nursing Practice (DNP) project examined ways to increase patients' knowledge of oral contraceptive and stroke prevention in African American women ages 20–40. Stroke is the fifth leading cause of death in the United States, affecting more African American women than men (Centers for Disease Control and Prevention [CDC], 2020). The use of oral contraceptives with combination hormone therapy poses the highest risk for a vascular incident (Schuiling & Likis, 2013). The use of oral contraceptives is not typically viewed as a risk factor; however, birth control pills increase women's risk from 1.9 times to 8.5 times for stroke (Loyola University Health System, 2018). This increase, along with other risk factors, can significantly impact the health of women. The use of oral contraceptives is a modifiable risk factor of which many women are unaware.

Problem Statement

Many women use oral contraceptives for family planning and medical purposes, such as acne and menstrual cycle regulation. Regardless of the reasoning, many women are still unaware of the risks associated with the use of oral estrogen contraceptives. This quality improvement project implemented an intervention program to educate about the risk factors and provide awareness to potentially reduce stroke incidence related to oral estrogen contraceptives.

Background

This section will discuss the issue of cardiovascular diseases. This has been at the forefront of healthcare for quite some time, and more specifically, cardiovascular disease topics of risks, rates, and prevention as it pertains to African American women. According to the CDC (2020), African American women in the United States have twice as many stroke incidences than their Caucasian counterparts. Research has also noted African American women have strokes at

younger ages and increased severity than other ethnicities (CDC, 2020). Many risk factors are contributing to these higher incidences. The first risk factor is high blood pressure (i.e., hypertension). African American women tend to acquire hypertension at younger ages and are at double the rate of Caucasian women. Sensitivity to the effects of salt and sodium intake may be the rationale behind the disparities in hypertension rates (CDC, 2020). Genetic blood disorders such as Sickle cell anemia may also alter blood cells, causing blockage and stroke. Obesity and diabetes are also higher in African American women, resulting in an increased risk of stroke (CDC, 2020). Other risk factors include the use of combination hormonal therapy, oral contraceptives, and pregnancy (CDC, 2020).

In 2015–2017, 72.2 million women ages 15–49 in the United States used contraceptives (Daniels & Abma, 2018). African American women represent 59.9% of the population using contraceptives (Daniels & Abma, 2018). Family planning is an essential part of women's lives. Women knowing the risks are key to prevention. Although the primary goal for most contraceptive use is family planning, the use of contraceptives comes with risks and side effects, and some may be debilitating or life-threatening. One common side effect is developing blood clots, which could lead to stroke (Schuiling & Likis, 2013). A blood clot can occur because of pregnancy, oral contraceptives, hypertension, or high cholesterol (Mayo Clinic, 2020) factors, causing it to obstruct or burst and preventing adequate oxygen blood flow to the brain (American Stroke Association [ASA], 2020). The effects of inadequate oxygenation in the brain causes what is known as a stroke. This lack of oxygen to the brain affects not only the brain but also ultimately affects other functions of the body, such as speech, vision, and body movement (ASA, 2020). The current recommendations for prescribing oral contraceptives advises against doing so in women with blood pressure readings $>160/100$, vascular disease, complicated diabetes, and

women older than 35, and those who smoke more than 15 cigarettes per day (CDC, 2013). Stroke is a debilitating disease and causes not only mental and physical burdens but also financial burdens on patients and families. Incidents of stroke have been noted in younger women aged 35–64 (Tong et al., 2019).

Purpose of the Study

This study aimed to understand women's knowledge gap with oral contraceptive use and stroke. On average, 90% of women have at least one risk factor for heart disease or stroke, and African American women explicitly have the highest stroke rate (American Stroke Association [ASA], 2020). This project aimed to provide education and awareness of stroke-related risks associated with oral contraceptive use in African American women ages 20–40.

Although the research efforts are minimal regarding stroke and oral contraceptive use, this research's primary focus was preventative based. Obtaining knowledge of patients' understanding of risks regarding oral contraceptive use was done through questionnaires. This tool was used to determine any knowledge gaps regarding oral contraceptive use and stroke. This quality improvement project focused on bringing awareness about risk factors associated with oral contraceptive use and stroke. The initiation of educating as an intervention was necessary to prevent the subsequent incidence effects of stroke from oral contraceptive use.

Significance

This topic selection was based on the limited research on stroke and oral contraceptive use. Despite the limited research, stroke is a debilitating and, in some cases, a deadly disease. On average, stroke affects one in four people nationwide (ASA, 2020). More specifically, strokes affect more women than men; one in five to be exact (ASA, 2020). With more women affected by this disease, it is cause for increased awareness and interventions. Educating patients on their

risks is key to understanding and decreasing stroke while using oral contraceptives. According to the American Stroke Association (2020), about 80% of clot-related strokes are preventable. The high prevention rate creates a clinical need to mitigate future incidence.

Nature of the Project

The goal of this DNP project was to educate and create awareness for providers and patients concerning risk factors. A collaborative effort involving the patient and provider is key to decreasing incidences of strokes. In doing so, creating measures to ensure the patients can effectively and safely practice family planning or use of contraceptives is vital.

Question Guiding the Inquiry

Q1. Will an evidence-based educational session assist with increasing awareness of stroke with oral contraceptive use in African American women ages 20–40?

P (patient population): African American women ages 20–40 using or who have used oral estrogen contraceptives.

I (intervention): Stroke prevention information, including risk factors, signs, and symptoms. Educate patients with a stroke prevention course.

C (comparison): Pre- and posttest questionnaires to determine the knowledge base of the participants.

O (outcomes): Bridge the knowledge gap regarding oral contraceptive use and stroke. Long-term goals are to decrease oral estrogen contraceptive-related stroke incidence in African American women ages 20–40.

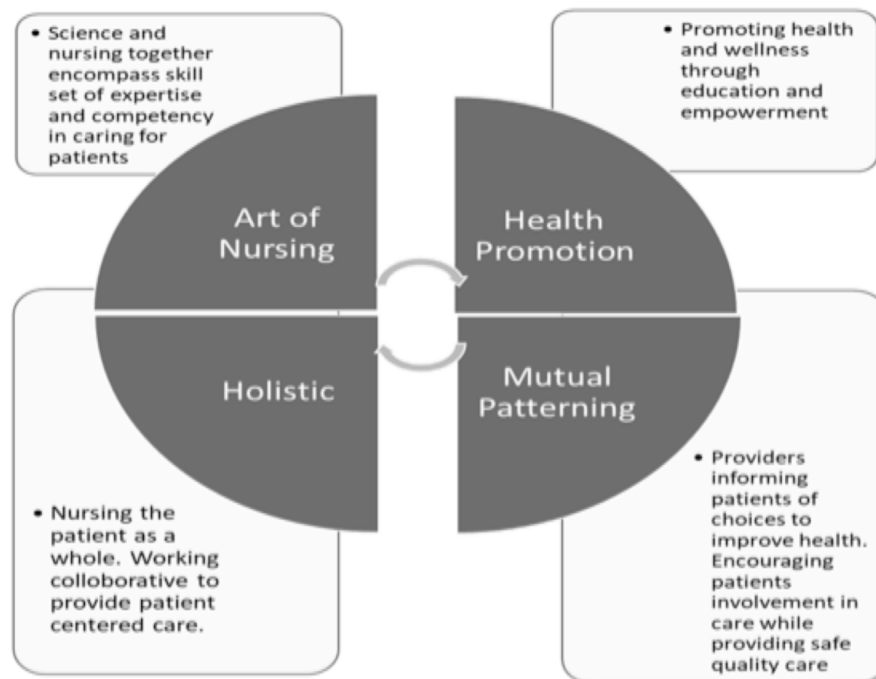
T (time): The time frame scheduled to complete this project was three months. This time allotment included recruitment and a one-day, two-hour session that included questionnaires and data analysis.

The research hypothesis was that educating African American women ages 20–40 on oral contraceptives using an evidence-based tool displayed a difference in their knowledge of oral contraceptives and stroke risk factors and clinical manifestation.

Theoretical Framework

Dr. Martha Rogers created the science of unitary human being theoretical framework. Rogers was a doctoral degree nurse who also taught in academia. It was her belief system that nursing required a collaborative effort of science and art (Nursing Theory, 2016). The science of nursing is knowledge- and research-based. The art of nursing consists of interventions and outcomes. A holistic view of nursing and caring for patients encompasses Rogers' theory. This multifaceted theory aligns with mitigating the clinical inquiry problem of interest (POI) prevention of stroke in women using oral contraception.

Martha Rogers' science of unitary human being nursing theory was selected based on the holistic view (Nursing Theory, 2016). Holistically caring for patients is imperative to educate and empower effectively. Providing women with proper education of birth control options should not be biased but evidence-based (Schuiling & Likis, 2013). Health promotion, serving the patient, and providing safe practice based on the clinician's expertise and skills are vital components of Rogers' theory (Nursing Theory, 2016). A collective inclusion of sharing knowledge, offering choices, empowering the patient, evaluating, and self-awareness of both the human and environmental fields will aid in addressing this POI (Nursing Theory, 2016; see Figure 1, which I created).

Figure 1*Unitary Theoretical Framework***Operational Definitions**

Standard vital terms were used during the research of this topic. However, some of these key terms are not commonly used and require clarification. Throughout this paper, these key terms will be utilized. These definitions are set in place to provide clarity to understand the topic of oral contraceptives and stroke.

Blood clots. Blood clots are clumps of hardened blood in the arteries or veins (Mayo Clinic, 2020).

D-dimer. Blood sample test used to determine how blood is clotting (Raffield et al., 2017).

Ischemic stroke. A type of stroke where there is an obstruction of oxygenated blood to the brain (ASA, 2020).

Oral contraceptive. Oral contraceptives are medications taken daily containing two types of hormones (estrogen and progesterone; Schuiling & Likis, 2013).

Scope and Limitations

This study focused on the effects of a knowledge deficit about stroke risk factors in African American women ages 20–40 taking oral contraceptives. A knowledge-based questionnaire of the mechanism of action, use, risk, and side effects was given to patients from May–July 2020. Limitations arose during the research outside of my control, such as the loss of participants. Another limitation was the time frame in which the patients received the educational session and the posttest questionnaire. It could not be verified that the information was retained or if it was from short-term memory. While I cannot control the participant’s involvement or retention of the information, I was mindful of these limitations. These obstacles do affect the results of the research. Hence, it is also possible that future researchers may doubt the conclusion of this study and its results.

Chapter Summary

This research aimed to improve the knowledge of African American women ages 20–40 in understanding the side effects of oral contraceptives and stroke symptoms when using or previously having used oral contraceptives. The study did enhance patients’ knowledge to make the safest oral contraceptive choice while considering the risk factors. It also gave providers insight as to where the knowledge gaps are being missed.

Chapter 2: Literature Review

Stroke has become a more prominent topic since the recent deaths of famous actors. Research has found a correlation between estrogen-based oral contraceptives and blood clots (Camara et al., 2017). Despite these research efforts, there is still limited literature on stroke-related oral contraceptive use. Implementing Rogers' unitary theory with the POI provided a more effective means of ensuring the patient is being addressed. Rogers' unitary theory addresses the first component of this quality improvement project by empowering the patient through education. Providers do so by ensuring patients are aware of their risks, benefits, and options regarding oral contraceptives and stroke. Promoting health and wellness through an educational course will provide empowerment for these women to make informed health decisions. The next component is utilizing the knowledge from evidence-based research that displays competence from compassionate caregivers while providing patient-centered care. The collaborative effort of evidence-based research and nursing art can guide the process of health promotion. The evidence-based research used an innovative approach to incorporating technology to educate patients. As a result, slight improvements were seen in patient knowledge of oral contraception. It was vital to address risks and side effects as well as the mechanism of action and effectiveness. A comprehensive approach to care can enhance patient education and health (Hall et al., 2013).

The Abilene Christian University (ACU) library provides a variety of options when searching for research literature. Research guides offer diverse categories in areas such as theology, business, psychology, nursing, education, and management. I selected the DNP link, then the CINAHL link, which took me to EBSCOhost. According to information on the Georgia State University Library (2018) site, it was very imperative to start with the most recent research

and progress to the oldest. Research for this topic was done based on literature over the last six years to provide the most accurate data (Georgia State University Library, 2018).

After completing the search, a full-text article box was selected. Including keywords and terms narrowed the search further. The first selected word was *stroke* followed by optional secondary words such as *African American women*. With these options, a total of 2,769 research articles were obtained. Narrowing the search for specifics was another option in using keywords such as *blood clots* and *contraceptives*, which provided additional research articles. Next, I determined the level of evidence-based articles from the American Association of Critical Care Nurses strength level of proof. Once this was completed, the search was narrowed by attempting to select level 1 evidence-based articles that contained systematic reviews and meta-analysis and then randomized controlled trials and cohort studies. The next level of evidence was case-control studies, and this was done by using the level of evidence pyramid (Peterson et al., 2014).

Influence of Hormonal Contraceptives and the Occurrence of Stroke

The first research study utilized the critical care nurses rating scale. The research article consists of qualitative studies, descriptions, correlations, and is an integrative review (Peterson et al., 2014). This selected article discussed the influence of contraceptives and the occurrence of stroke. The hypothesis determined if estrogen-based hormones increased clotting factors that caused a clot, leading to stroke. Variables included the duration of use, risk factors, combined contraceptives, and the type of stroke. The study design was performed using an integrative review, which reviewed a variety of case-control studies from various databases such as CINAHL, Medline, PubMed, and Cochrane. There was a mixture of case-control and a cohort study with 323 to 98,790 women participants ranging in ages from 15 to 49. Surveys were completed in the United States, China, the United Kingdom, Africa, Asia, Europe, Australia,

Latin America, Denmark, and Sweden. Studies were published from 1986–2014. References cited in this integrative review were dated from 2011–2014. Because the data were from a Brazilian journal, biases from the results could be attributed to that factor.

Similarities were seen in studies of women who used the third-generation or low dose combination of estrogen and progesterone contraception that increased coagulation factors with the possibility of triggering a stroke (Camara et al., 2017). Differences found were the location of studies, participants used, types of birth control, and types of stroke. Limitations found in this study were it being integrative as opposed to a literature review. Specific databases were used, which may have limited results available (Camara et al., 2017). Strengths of this study were the diverse methodology of studies and locations to obtain data and complete the research. The weakness was that an integrative review generally does not use a rigorous method. As a result, the author's conclusions and recommendations may be deemed as biased (Melnyk & Fineout-Overholt, 2015). A limitation of this study was the exclusion of literature review studies (Camara et al., 2017). This study's findings advise that ethinyl estradiol in the combined oral contraceptive leads to the risk of stroke with no increases from the user of progesterone-only hormone therapy (Camara et al., 2017).

The integrative study provided data regarding differences in estrogen and progesterone-based hormones. The study utilized various categories based on hormones and the risk of stroke, dosage, duration of use, and risk associated with stroke (Camara et al., 2017). Some barriers for this study were the time frame in which the reviews were completed and the need to obtain more recent data. For example, no current information addressing stroke and the vaginal ring was incorporated (Camara et al., 2017). To achieve the most accurate data for adverse effects of contraceptive, inclusion of all types would need to be done.

Impact of an Educational Text Message Intervention on Young Urban Women's Knowledge of Oral Contraception

The institutional review board of Columbia University approved the second evidence-based research study of an educational text message questionnaire for young adult women (Hall et al., 2013). There was a total of 659 women ages 13–25 in the study (Hall et al., 2013). Of the 659 participants, 84% were African American, 41% Caucasian, 25% Hispanic, and 5% Asian and other, who were currently sexually active and living in the inner city (Hall et al., 2013). On average, educational attainment was a sophomore level in college (Hall et al., 2013). Initially, a baseline survey was given, followed by daily informative texts for six months. In the end, a comprehensive 41-item questionnaire was administered. There was a combination of telephone interviewing and text message questions. Question content included risks and benefits, effectiveness, mechanism of action, and side effects (Hall et al., 2013). Most research focused on improving knowledge of side effects. The goal of this research was to fill the knowledge gap of efficacy, benefits, and understanding how birth control works (Hall et al., 2013). According to Hall et al.'s (2013) research results, most improvement was shown in the knowledge of oral contraception, including mechanism of action, benefits, and effectiveness. One strength of this study is it is peer-reviewed research that uses the gold standard of random controlled trial methodology (Keele, 2011).

This research's level of evidence is based on the AACN's leveling system that utilizes expert opinions from obstetrics and epidemiology articles from multiple case reports (Peterson et al., 2014). Strengths of this study included the method of RCT and the use of descriptive statistics, bivariate, and analysis of variance (ANOVA) to compare scores. These tools assisted in determining the reliability and validity of the study (Keele, 2011). The weakness found in the

survey was the inability to see if patients were accurately answering questions on their own or doing a Google search for information. Findings in this study displayed the most improvement in knowledge regarding the mechanism of action and effectiveness (Hall et al., 2013). This study provided interventions for educating young women on an oral contraceptive. The study also implemented an innovative means of providing health education to the youth. Incorporation of technology is a great tool to assess and evaluate the effectiveness of knowledge of oral contraceptive use. Despite this study providing more implementation for my PICOT, there were limitations in the reliability and validity of this study (Hall et al., 2013).

Women and Stroke Knowledge

The third research article discussed women and their knowledge of stroke based on age, race, location, or marital status. A stroke recognition questionnaire (SRQ) of 40 stroke symptoms and factors was given. The sample size of the study consisted of 97 middle-aged women in the Southeast region. This research also gathered opinions from experts in nursing and psychology, and its hypothesis was about a woman's knowledge of stroke and if any influential factors existed. Two strengths were found in the study. The first was using a conceptual framework of the common-sense model (CSM). This framework enabled my interruption of participants' actions regarding their thoughts of illness (Ennen & Beamon, 2012). The study design was a descriptive quantitative nonexperimental design and received approval from the institutional review board. Because multiple factors existed, the study also used ANOVA testing (Ennen & Beamon, 2012). In addition, a content validity index (CVI) was implemented to determine reliability (Ennen & Beamon, 2012). The second strength was the credibility of the research performed as it utilized evidence-based information and used peer reviews.

The weakness of the study included the fact the questions were yes or no, in which the participant has a 50/50 chance of answering correctly. Findings included no significant differences in recognition of stroke by residence location (i.e., rural or urban). Participants with income less than \$22,200 a year had difficulty identifying coordination as a symptom (Ennen & Beamon, 2012). There was no significance in stroke risk factors by residence (Ennen & Beamon, 2012). A Tukey's post hoc test revealed that African American women had significantly lower scores for risk factors than any other race (Ennen & Beamon, 2012). Limitations of this study included participants guessing on the questions. The small sample size also consisted of primarily educated Caucasian women. As a result, this would not have given researchers the most appropriate data to include regarding consumers knowledge of health. Another limitation was the participants being in a weight loss program. These participants may have been more knowledgeable regarding the signs and symptoms of a stroke (Ennen & Beamon, 2012). Therefore, these limitations would create the question as to the adequacy of the research and results received from this study. The third research study also provided clinicians with a background on the knowledge of women and health. The difference in this focus was on stroke knowledge with influential factors present. As women carry the highest prevalence of stroke, understanding the rationale behind the disparity is vital before interventions can be implemented. As clinicians, we must first obtain the necessary data, like the items found in this research, to move forward. The difference in this study was the age of the participants and the inclusion of all ethnicities.

Assessment of Vascular Disease Prevention Practices in Urban Women

The fourth research study focused on assessing preventative measures for cardiovascular disease and whether it is acceptable in women over 40 years old. This cross-sectional study was

completed using data obtained from the patients' charts. The sample size was 1,815 women ages 40 and older in five metropolitan primary care offices (Chaturvedi et al., 2016). Data included patient's risk factors such as diabetes, hypertension, and hyperlipidemia. Patients with a history of heart disease (e.g., stroke and atrial fibrillation) were also included in the study. Those receiving treatment for the above risk factors, either as primary or secondary, were vital components to this three-month study. The goal of this study was to determine if preventative measures of CVD were enough for women aged 40 or older. Chi-square tests were used to categorize variables and findings, including comparisons among ethnicities (Chaturvedi et al., 2016). Results of the study stated a higher body mass index for urban patients, as well as higher risk factors for heart disease and stroke than suburban women (Chaturvedi et al., 2016). There were gaps in preventative efforts of cardiovascular disease in young women (Chaturvedi et al., 2016). Also, the use of statin drugs increased with a diabetes diagnosis (Chaturvedi et al., 2016). The study was limited in many ways, including the lack of incorporation of all cardiovascular risk factors. It was also biased in it only included participants from private practices associated with medical schools (Chaturvedi et al., 2016). Another limitation was determining adherence to primary and secondary pharmacological therapy. It is recommended that the implementation of cardiovascular risk screening be performed, specifically with young women using the Framingham risk score in the electronic medical record (Chaturvedi et al., 2016).

Risk Factors for Thrombosis in an African Population

Another research article focused on the risk factor of clots (i.e., thrombosis) in individuals of African descent. Genetics often play a role in many disease processes. This research is centered on risk factors and clinical manifestations of venous thromboembolism (VTE) and pulmonary embolism (PE; Fall et al., 2014). Research has found more incidences of

VTEs in northern regions such as Europe versus the Mediterranean (Fall et al., 2014). Although findings were able to narrow down prevalence, etiology is unknown. The study used a cross-sectional case-control study with 150 cases and 200 controls. The sample age ranged from 17 to 78, with an average age of 42. Patients for the dependent variable were recruited from hospitals in Dakar, Senegal, with suspected DVT, or PE, and those with a history of DVT (Fall et al., 2014). The independent variable patient population was recruited from “healthy blood donors with no history of thrombosis” (Fall et al., 2014, p. 2). The remaining control group included patients over 65, receiving testing preoperatively. The sampling of participants’ blood was analyzed for cell count, blood type, hematologic disorders, and antibodies.

One strength of this study was the length of time obtaining data over three years for consistency with results. Another advantage was the use of statistical analyses measuring risk factors with logistic regression (Fall et al., 2014). A confidence interval of 95% proved in favor of the findings. A significant outcome of the study was the association of anti-phospholipid (APL) antibodies and DVT. Patients had four times more occurrence risk of DVT with a presentation of APL antibodies (Fall et al., 2014). Another finding was a decrease in protein S, an anti-clotting factor, which increases the risk of clots 15 times more than others (Fall et al., 2014). Females also displayed a higher risk of acquiring clots and were mostly related to obstetrics and birth control.

Burden of Cerebrovascular Disease in the United States

Cerebrovascular disease (CVA) is defined as anything that affects the veins or arteries leading to the brain such as stroke, carotid, vertebral, intracranial stenosis, aneurysms, and vascular malformations (American Association of Neurological Surgeons [AANS], 2020).

According to the AANS (2020), CVA is known as the most common life-threatening event with ischemic stroke contributing to 10% of strokes worldwide.

Stroke affects millions and is the leading cause of long-term disability in the United States (AANS, 2020). The burden of disease has many effects, ranging from physical, mental, and financial burdens. This study focused on the burden of CVA in adults 35 years and older. The study aimed to provide the most recent estimated cost of both fatal and nonfatal CVA events in the United States based on age, sex, and location from 2006–2014. Although there have been noted decreases in mortality rates in the United States since the 1900s, stroke continues to remain the fourth leading cause of death for women and fifth leading cause of death for men (Tong et al., 2019). The research identified 795,000 new or reoccurring cases per year. On average, 25% of stroke survivors have reoccurrence in the first five years (AANS, 2020). This study utilized data from the nationwide emergency department sample (NEDS) to examine visits of hospitalized adults 35 years and older. According to Tong et al. (2019), an estimated annual directed medical cost for a stroke is \$17.9 million from 2012 to 2013. Additionally, an increase in mortality among younger adults ages 35–64 was also noted. One point three million CVA events were simultaneously noted, along with other chronic diseases (Tong et al., 2019). This rate increased by 36% among young adults, ages 35–64, from 2006–2014 (Tong et al., 2019). Research has also identified the southern region as having the highest CVA events (Tong et al., 2019).

The strength of this study was the use of a NEDS and obtaining national estimates in the United States (Tong et al., 2019). Another strength was the inclusion of both fatal and nonfatal CVA events. Limitations of this study included the inability to capture patients in outpatient

settings and repeat emergency room visits. It also excluded transient ischemic attacks (i.e., TIA), also known as a mini-stroke (Tong et al., 2019).

Chapter Summary

Research has found that estrogen-containing contraceptives do increase clotting factors and the possibility of stroke. However, additional research is required to determine impairments women suffer from a stroke because of estrogen-based contraceptive use (Camara et al., 2017). Implementing six months of educational interventions via the use of technology such as text messaging to the youth is innovative and much needed. However, there was still a participant knowledge deficit in uneducated, unemployed minority women. Also, there was an overall disparity in the knowledge of side effects from contraceptive use. This was a significant intervention, but it did not address the concern of risks or side effects, nor did it incorporate the age group of women this quality outcome project intended to capture.

Research studies gave insight into how women understood signs and symptoms of a stroke. Studies also provided factors that may influence women's knowledge or lack of knowledge on the topic of stroke. Although my focus was on women ages 20–40, one study did provide insight into what type of study design could be used to obtain the data. It is understood women of all ages are being affected by stroke, and interventions are very much needed; however, more research is necessary to ensure a decrease is seen in incidence across the spectrum. It has been challenging to locate analysis solely performed on stroke because of contraceptives. One drawback may be the lack of reporting the incidence. This drawback may be a fault on the consumers as some may not be aware of the steps to take to report adverse effects from medications accurately. The primary goal is to provide educational intervention. Once effective education of adverse side effects, signs, and symptoms of a stroke are achieved,

progression can be made. The next step for clinicians would be to ensure proper follow-up is being completed.

The burden of stroke affects patients and families in many ways. The burden has become more prevalent among the younger population. To mitigate this burden in public health overall, the aim should be at the prevention level. Providing health and wellness strategies to educate the public will be vital in mitigating incidences in the younger population. Promoting awareness of risk factors and aiding in improving lifestyle and behavior changes are some strategies that may aid in addressing the burden of stroke among the younger population (Tong et al., 2019).

Chapter 3: Methodology

This project focused on determining a patient's knowledge base of acquiring blood clots while using oral contraceptives resulting in a stroke. Current evidence advises protocol for prescribing oral contraceptives that are based on medical history. Obtaining blood pressure, body mass index (BMI), and baseline weight are necessary before prescribing oral contraceptives (CDC, 2020). Evidence-based research has found that women with elevated uncontrolled blood pressure reading (systolic >160 and diastolic >99) should avoid the use of oral contraceptives. Additionally, women who have a history of breast cancer, vascular or heart disease, migraine headaches with aura, certain liver diseases, and are older than 35 who smoke more than 15 cigarettes a day are advised against using oral contraceptives (CDC, 2020). There are no current recommendations for testing clotting factors before prescribing. This study aimed to provide education and awareness on risk factors to patients while limiting the impact of stroke-related symptoms to oral contraceptive use.

Project Design

I was responsible for all project activities, including consent forms, a demographic form, an educational session, and pre- and postquestionnaires. Those women meeting inclusion were the target population. Participants were given full disclosure of the study's aim and methods before receiving and signing consent. Participants were also allowed to withdraw consent and participation in the study at any time without penalty. The demographic form consisted of age, education, oral contraceptive type and length of time of use, the reasoning for taking an oral contraceptive, and smoking and stroke history. The educational session was based on the question of content and evidence-based literature using Zoom video conferencing with a question and answer period at the end of the session.

Instruments and Measurement Tools

A knowledge-based questionnaire created in 2012 by Dr. Kelli Hall, Dr. Carolyn Westhoff, and Dr. Paula Castano was selected for use in this research. The oral contraceptive knowledge questionnaire primarily focused on the content of use, risk benefits, and side effects. Written permission was requested to use the knowledge-based questionnaire to avoid plagiarism. Permission was granted in writing via email from Dr. Hall (see Appendix A). The oral contraceptive knowledge questionnaire was used to evaluate randomly selected participants' knowledge before and after receiving educational information.

This innovative tool was the most effective in determining patients' understanding of oral contraceptive use and stroke risks. This oral contraceptive knowledge questionnaire was used in two other studies in 2010 and 2013, which used the pre- and postquestionnaire to determine the participants' baseline knowledge of oral contraceptives compared to their knowledge posteducational counseling. According to Hall et al. (2013), oral contraceptive knowledge was low among young women. Lower scores were significant in younger, less educated minority women. The study also stated the need for more interventions to improve knowledge of contraceptive use and side effects. This tool is key to determining if a knowledge deficit exists with women using an oral contraceptive. I used a five-point Likert scale as the measurement, including true or false responses, multiple-choice, alternative, and open-ended responses. Question content consisted of a mechanism of actions, benefits, side effects, risks, and use of oral contraceptives. The assessment tool used in this study has been provided (see Appendix B). Permission of partial use of the oral contraceptive knowledge tool questions was granted (see Appendix C). To confirm accuracy in the selection of partial use of the questions, three expert medical providers (i.e., a family practice or OBGYN, an emergency medicine physician, and a

women's health nurse practitioner) were selected to review the questionnaire. They determined, via email, the rationality of question content that pertained to this research topic (see Appendix D).

Data Collection, Management, and Analysis Plan

Following approval from the Abilene Christian University's Institutional Review Board (IRB), participants were recruited for involvement in this research study. Recruitment was performed using flyer advertisements via the clinic and social media. Originally, participants were to be recruited in person. It was intended to recruit in local doctor's offices in Memphis, Tennessee, and the physician in charge granted approval. Recruitment was to be done via the use of social media and placing flyers around local campuses and universities, as well as clinics. A local community center would have been the location for a one-day, two-hour session to collect consents, data, and provide light snacks and beverages. Envelopes with random numbers corresponding with participants' seats were to be used to keep information confidential and nonbiased. Random drawings would be done using the seat numbers.

Since the event of the COVID-19 pandemic and mandated social distancing, an alternative method of data collection was created. In the absence of being able to meet in person, enrollment to recruitment was completed via social media with flyers that included my contact information. Recruiting was successfully done using social media (i.e., Facebook and Instagram) and word of mouth with the IRB-approved flyer. In the wake of the global COVID-19 pandemic, performing research has forced researchers to become innovative in recruiting, disseminating, and collecting data. As a result, everything was done virtually utilizing email, Hello Sign for consents, SurveyMonkey, and Zoom to communicate and collect data. Confirmation of intent was emailed to the participant(s) and requests for consent utilized Hello Sign. Once consents

were received, participants received detailed emails advising them of the process to complete the presurvey demographic form. After demographic and presurveys were collected, participants were emailed an option of three dates and times to select and join a brief 10- to 15-minute PowerPoint question and answer educational session about birth control and stroke via Zoom (see Appendix F). Once participants completed the informative Zoom session, they emailed a postsurvey to complete the research process.

All participant information was placed on an Excel sheet by their email address in which their progress was tracked for completion of the consent, demographic, pre- and post-survey, and educational session. Participants were selected based on their ages (20–40) and being African American females using or having used oral contraceptives (both estrogen and progesterone), without use for hormonal replacement therapy, and no previous history of stroke. Interested participants meeting these criteria were then emailed the SurveyMonkey link for the prequestionnaire. Random numbers starting with 1–70 were assigned to participants as consents were received; this was used to track participants, and names were replaced to maintain confidentiality. Settings were also set in SurveyMonkey to omit participants' names and contact information as results of the questionnaires were returned to me to prevent bias of survey results. Participants were given 48 hours from the date of receipt to complete all surveys, and they received daily reminders.

After completing the prequestionnaire, participants were sent a link to vote on the date and time to attend the educational session via Zoom. Once the participants selected their Zoom presentation date and time, a link was emailed to them to dial in for the audio and visual presentation of my educational content. I set Zoom settings so no participants were visible. The educational presentation took 15 minutes, and after the presentation, participants were given time

to ask questions. In each link, and during the presentation, participants were reminded of their ability to withdraw at any time without any penalty or affecting their healthcare. Once all questions or concerns were addressed, participants were emailed the link for their final posttest in which they were given 24 hours to complete, and they were sent a reminder email at the 12-hour mark.

All questionnaires took no longer than 15 minutes to complete. Data collection consisted of participants receiving a presurvey of 16 questions regarding the mechanism of action, use, side effects, and risks associated with oral contraceptive use. There were no changes in the postsurvey questions that participants received immediately after completing their educational sessions. Pre- and posttest questions were scored utilizing a Likert scale with one point for each question. The highest possible score participants could receive was a 16 for the pre- and post-surveys. Based on the results, there were improvements noted in the participants' knowledge as it relates to oral contraceptives and stroke.

I did six random drawings throughout the study utilizing participants' randomly assigned numbers for \$10 Amazon e-cards, which were emailed to the winners. All data were input into an Excel sheet and saved on a secured drive. Only numerical data and results without the participant's identity were shared for analysis with the statistician. All data collected are stored in a secure university Google drive.

The research's structure was based on a quantitative research design and a *t*-test research statistical analysis. This was performed to understand how the independent variables impact the dependent variables. The goal was to determine if implementing an educational session would enhance the participants' knowledge of oral contraceptive use, risks, and benefits. The use of this *t* test provided analysis to determine the effectiveness of the educational course and any

knowledge gaps (Kellar & Kelvin, 2013). In this case, the study examined the knowledge of pre- and posteducation on oral contraceptive use, risks, and side effects.

The sample size of 70 was selected and calculated by the statistician based on the expected odds ratio of ischemic stroke. Currently, no previous research reported standard deviations. I sought a sample size of $N = 70$ to allow for a standard deviation of approximately 4.0 or less.

Methodology Appropriateness

A quantitative research design was implemented for this project. There was no control group. Comparison was done with the participants' pre- and postdata. Data analysis was performed utilizing the *t* test to compare oral contraceptive (OC) knowledge pre- and posteducational sessions using SPSS version 26. Permission was granted via email (see Appendix E) to use the OC knowledge questionnaire that was modified to use 16 questions and was given in one setting over a two-hour period before and after the educational session. The participants signed the consent form agreeing to participate, and these were collected. Participants were informed they could withdraw consent and or participation at any time without penalty.

Feasibility and Appropriateness

I currently practice in an educational and occupational health setting. Although I do not specialize in hematology, clots and strokes associated with oral contraceptive use is a concern for this patient population. Participants were recruited using social media (i.e., Facebook and Instagram) by posting a flyer and by word of mouth. The intervention provided education to participants regarding the use, risks, and benefits of oral contraceptives as it pertains to stroke. The IRB granted the flyer's approval and the use of social media as a means of recruiting

participants (see Appendix E). Six random drawings occurred throughout the research process for a \$10 Amazon gift card. I assumed all administration material such as paper envelopes, ink cartridges, Wi-Fi, and gift cards, which was absorbed through a scholarship through the Tennessee Nurses Association.

Institutional Review Board Approval and Process

Abilene Christian University requires students to obtain IRB approval before implementation of DNP projects. Ethics CORE was completed in September 2019. The IRB requires this training to be completed by investigators and all committee members, administrators, and those involved with advising me on this project. The ethics CORE training courses covered information, including subjects' rights, consent, withdrawals, risks, benefits, confidentiality, and research funding (ACU Office of Research & Sponsored Programs, 2019). The IRB approval was begun in April 2020 and granted on May 15, 2020 (see Appendix E). Revisions were granted to increase the age and inclusion criteria of African American women ages 20–40 that have ever taken oral contraceptives. Approval was granted for an exempt research project.

Interprofessional Collaboration

I am a DNP student practicing in an occupational clinic setting. Healthcare providers are vital stakeholders in this POI. Other stakeholders are participants of the study. Once the project was ready to implement, I assisted in recruiting participants by advertising via social media, email, and word of mouth. Obtaining the right sample size was imperative, and those interested were referred to me. I determined if participants met the inclusion criteria. The subjects relied on me to provide accurate information as it pertains to oral contraceptive use. The IRB approved the request to proceed with the study while protecting human subjects (see Appendix E).

Before participation in the study, consent was obtained by the participants and verification of inclusion criteria was performed. Interprofessional collaboration with participants was completed with the inclusion of medical health professionals (i.e., obstetrician, emergency room, and women's health) and a statistician for data accuracy and validity. Weekly reviews of the data provided a useful communication tool to address and rectify any issues before proceeding.

Practice Setting

This research's location was completed virtually in my home and the homes of participants for purposes of the COVID-19 pandemic and meeting social distancing health department guidelines. Qualified participants were provided with the 16-question knowledge-based questionnaire. This information was then examined to determine the patient's knowledge base of oral contraceptive use, risks, and side effects. Participants were recruited via social media through the use of Facebook, Instagram, and word of mouth. Participants were given the option to contact me if they had questions once reading the criteria on the flyer that was circulated on social media. This setting was selected as the safest recruiting means due to the pandemic and to obtain the most interest. I continued to use electronic means of communicating with participants through email for consents, demographic forms, and surveys.

Target Population

The target population for this POI was African American women ages 20–40 using or having used oral contraceptives. The women had no history of clots or strokes. The reasoning for oral contraceptive use was not limited to family planning. Participants qualified if they were using oral contraceptives for alternative reasoning such as acne and menstrual regulation. Any inclusion and exclusion criteria were necessary to maintain the efficacy and accuracy of the

research process. The demographic of the participants focused on African American women in childbearing ages 20–40. These participants were currently utilizing oral contraceptives or have used them in the past with no specific reasoning in mind. Inclusion criteria consisted of African American women ages 20–40 that have ever used oral contraceptives. Exclusion criteria for this quality improvement project included the following:

- Non oral contraceptive use,
- history of a previous stroke,
- ethnicity other than African American,
- <20 years of age,
- >40 years of age, and
- currently on hormonal replacement therapy.

Risks and Benefits

The risks of this study were participant involvement, privacy, and environmental. Since participants are currently on oral contraceptives or have taken them in the past, some knowledge can be assumed; however, accuracy and understanding are crucial to closing the gap. The risk was minimized with measures such as ensuring that information was kept securely, and conversations held in a secure environment. The data were collected and analyzed as efficiently as possible with the aid of research Excel sheets to keep organized.

Collecting and analyzing this data provided evidence of the importance of educating patients and understanding that participants are at more risk by a lack of knowledge of oral contraceptive use, risks, and side effects. Essentially, the goal of this POI was to bring awareness, to educate, and to decrease the incidence of stroke-related symptoms from using oral contraceptives.

Conflict of Interest

I am an ambassador volunteer with the local Mid-South American Heart and Stroke Association. I did not review any participants' Health Insurance Portability and Accountability Act (HIPAA) related information.

Timeline

The timeline of this study is outlined in an appendix (see Appendix G). The scholarly project was initiated at the DNP program start (May 2018) and carried on through program completion (anticipated no later than October to December 2020).

Chapter Summary

This quantitative design aided in determining the effectiveness of educating patients on oral contraceptive use, risks, and side effects as it pertains to stroke. This method was most appropriate as it focuses on preventative measures. Awareness and education are vital components to ensuring safe prescribing practices are being implemented into practice. This tool enabled patients with the ability to understand better the use, risks, and side effects of oral contraceptive use as it pertains to stroke. Statistical analysis was performed utilizing a *t* test to determine if the implementation of an educational session would increase the participants' knowledge base of oral contraceptive use, risks, and side effects as it pertains to stroke (Kellar & Kelvin, 2013). Obtaining approval to perform this study was done through ACU with IRB ethical procedures in place.

Chapter 4: Results

The research was successfully implemented; however, the time frame varied with some changes for recruiting purposes. I successfully disseminated educational information to participants and obtained consent, demographic data, and pre- and postquestionnaires electronically, as previously stated. Obstacles occurred out of my control, and changes were made accordingly with appropriate IRB approval. One change was extending the age range from 30–40 to 20–40. During recruitment, it was identified that many women were no longer on oral contraceptives; however, they had previously used and were currently using other forms of contraceptives such as an intrauterine device and a Depo-Provera injection. The inclusion of this patient population was also approved by the IRB to capture the required participants. A strength of this quality improvement project was the ability to determine knowledge deficits in this high-risk population. The study also gives healthcare providers insight into the importance of relying on the information before medication administration. The study's weakness would be the amount of time it took to gather data from participants with sending multiple emails. Another weakness would be biases in the results as I am a stroke survivor. It is recommended for future research to utilize technology as a means for recruitment and capturing participants. Although it was not initially the planned option of recruiting participants, technology was convenient for both the participants and me. Evolving healthcare and technology requires an innovative edge to stay current with research. Utilizing technology for recruiting and data collection will also expedite the dissemination of evidence-based practices at the bedside.

One limitation of this quality improvement project's scope was the onset of the COVID-19 pandemic and the inability to recruit in the community as social distancing and lockdown

orders were set in place. The pandemic also created additional stressors for the participants, such as loss of work and illness, which decreased interest in participating in the study.

Purpose of the Project

This research aimed to bring awareness of risk factors about clots and strokes related to oral contraceptive use. It was also intended to enhance participants' knowledge while providing them with education and awareness of risk factors, signs, and symptoms of a stroke. This educational intervention was created to prevent the subsequent incidence of blood clots or stroke from oral contraceptive use.

Discussion of Demographics

Demographics were initially based on African American participants, ages 30–40, using oral contraceptives. However, the criteria had to be later changed to include a broader age range. Once recruitment began, it was found that many participants were not in this 30–40 age range or currently taking oral contraceptives. Today's world of medicine offers women many contraceptive options, and many women have opted to utilize implants and injections as a form of contraceptive. To meet the required sample size and deadlines and with IRB approval, the age range was increased to African American women ages 20–40 and those who have used oral contraceptives. Participants were given an eight-question demographic form to complete. The demographic form questions consisted of age (see Table 1), education, number of pregnancies, type of oral contraceptive use, length of time, the rationale for using an oral contraceptive, smoking, and stroke history. With the increased sample criteria, the average age of participants was 32. Out of the 69 participants, most hold graduate degrees, followed by a bachelor's degree with the least amount having associate degrees (see Table 2). Of the participants, 33.3% had never been pregnant, and 23.2% have been pregnant at least once or twice (see Table 3).

Precisely 44.9% of the participants are currently using estrogen- or progesterone-based oral contraceptives and only 6% on progesterone-only (see Table 4). Most participants stated they used oral contraceptives for six or more years (see Table 5). The primary use for oral contraceptives was for family planning purposes with regulating the menstrual cycle as the second most selected reason (see Table 6). There were two smokers with no history of stroke reported by participants (see Table 7).

Demographic Results

Table 1

Age of Participants

	<i>N</i>	Minimum	Maximum	<i>M</i>	<i>SD</i>
Age	69	20.0	40.0	31.877	6.0015

Table 2

Education of Participants

Education	<i>f</i>	%	Cumulative %
High school	17	24.6	24.6
Associates degree	4	5.8	30.4
Bachelor's degree	20	29.0	59.4
Graduate degree	28	40.6	
Total	69	100.0	100.0

Table 3

Number of Pregnancies

Number of Pregnancies	<i>f</i>	%	Cumulative %
0	23	33.3	33.3
1	16	23.2	56.5
2	16	23.2	79.7
3	1	1.4	81.2
More than 3	13	18.8	
Total	69	100.0	100.0

Table 4*Use of Contraceptives*

Contraceptive Type	<i>f</i>	%	Cumulative %
Estrogen only	11	15.9	15.9
Progesterone only	6	8.7	24.6
Estrogen or progesterone	31	44.9	69.5
Don't know	21	30.4	
Total	69	100.0	100.0

Table 5*Length of Time Using Contraceptives*

Years	<i>f</i>	%	Cumulative %
1-2	20	29.0	29.0
3-4	10	14.5	43.5
5-6	10	14.5	58.0
More than 6	22	31.9	89.9
Don't know	7	10.1	
Total	69	100.0	100.0

Table 6*Reasons for Using Contraceptives*

Reasons	<i>f</i>	%	Cumulative %
Acne	2	2.9	2.9
Family planning	42	60.9	63.8
Regulating cycle	20	29.0	92.8
Other	5	7.2	100.0
Total	69	100.0	100.0

Table 7*Smoking History of Participants*

Number of Years	<i>f</i>	%	Cumulative %
3	1	1.4	1.4
10	1	1.4	2.9
Never smoked	67	97.1	
Total	69	100.0	100.0

Note. No participants reported a history of stroke.

Data Analysis

The analytic method used for this outcome research project did not deviate from its original plan. Participants received presurveys, educational sessions, and a posttest. A descriptive statistic (see Tables 8 and 9) was performed for the pre- and postsurveys regarding the use, side effects, risks, and benefits of oral contraceptives and the risk factor signs and symptoms of a stroke (Kellar & Kelvin, 2013).

Table 8

Pretest and Posttest Descriptive Statistics of Oral Contraceptive Knowledge Questionnaire

	<i>N</i>	Minimum	Maximum	<i>M</i>	<i>SD</i>
Pretest score	69	0	16	9.03	3.185
Posttest score	69	0	13	10.80	2.019

Table 9

Overall Paired Sample t Test for Pre- and Post- Oral Contraceptive Knowledge Questionnaire

Results

	Mean Difference	<i>SD</i>	95% Confidence Interval of the Difference		<i>t</i>	Sig. (two-tailed)
			Lower	Upper		
Posttest score Pretest score	1.768	2.573	1.150	2.386	5.707	.000

The results proved there was a significant improvement in knowledge after oral contraceptive and stroke education. The noted areas with the most increase included blood clots, stroke, and heart attack while taking oral contraceptives (Kellar & Kelvin, 2013).

This method was most appropriate in examining the data before and after education to determine the potential knowledge deficits. The original, which required 70 participants, was not met due to recruiting changes because of the limited ability to go into public facilities due to the

COVID-19 pandemic and to meet deadlines. Initially, 73 participants were successfully recruited; however, they could not complete the entire research process. One participant was disqualified as she had a stroke history, which was one of the exclusion criteria. Another participant expressed interest and signed consent, but did not complete the process. Three other participants also expressed interest via email, signed the consent, completed the demographic and presurvey, but failed to respond to email correspondence to complete the Zoom educational session or postsurvey. As a result, there were a total of four withdrawals.

Approval was granted by Dr. Hall, the original author of the oral contraceptive knowledge questionnaire tool, using 19 questions versus the original 40. A professional healthcare panel also reviewed the questions for this research topic's appropriateness. Three of the questions were fill in the blank definition questions regarding blood clots, heart attack, and stroke and were not included in the scoring. Performing a data analysis is a vital component to ensuring the accuracy of data collected.

This quantitative research utilized descriptive statistics to determine the effectiveness of the educational sessions provided to the participants (Kellar & Kelvin, 2013). A power analysis was performed of the research data, and a difference between means was 1.77, the standard deviation was 2.6665, the sample size group was 69, the alpha level was 0.05, and the power (two-tailed test) was 0.972. Ultimately, the power for the data was 97.2%, and the accepted power is 80% or higher.

A chi-square test of independence was performed to examine whether a correct answer for Question 1 was independent of when a respondent completed the survey (before or after the intervention). The results of the chi-square test revealed a significant relationship between a correct answer for Question 1 and when a respondent completed the survey, $\chi^2 (1, N = 69) =$

11.739, $p = .001$. Tables 10 and 11 display the results of the cross-tabulation and the chi-square test for Question 1. The results of the chi-square revealed a significant relationship between whether a participant provided the correct answer and whether the participant had received the intervention.

Table 10

Contingency Table for Responses to Question 1: Cross-Tabulation

	Incorrect	Correct	Total
Pretest	19	50	69
Posttest	4	65	69
Total	23	115	138

Note. Question 1 was true or false response if the pill has either a combination of estrogen or progestin only.

Table 11

Contingency Table for Responses to Question 1: Chi-Square Tests

	Value	Asymptotic Significance (two-sided)	Exact Sig. (two-sided)	Exact Sig. (one-sided)
Pearson chi-square	11.739	.001		
Fisher's exact test			.001	.001

Question Guiding the Inquiry

The PICOT question was, Will an evidence-based educational session assist with increasing awareness of stroke with oral contraceptive use in African American women ages 20–40? Results showed a mean of 9.03 and a standard deviation of 3.185 for the pretest score and the posttest had a 10.80 mean with a 2.019 in standard deviation. The posttest is the difference between the pre- and posttest, which was 1.768 with a 2.573 overall standard deviation. The test was set at a 95% confidence interval of 2.386 (see Table 9).

Reliability and Validity

This study used previous research questions as the intervention. Contingency tables were used to show relationships between the pre- and post-survey responses. A chi-square and Fisher's exact test analyzed the data and ensured the smaller sample size's accuracy. The Fisher's exact was most appropriate to ascertain that the posttest results were not by chance. The questions used were also reviewed by a panel of three healthcare professionals to determine the appropriateness for purposes of this research. With the smaller sample size, the confidence interval states the results are 95% true (Kellar & Kelvin, 2013).

Interpretation of Findings and Inferences

Overall, the $N = 69$ sample size was sufficient to determine the effectiveness of the intervention. Participants scored highest in the risk-related questions for taking oral contraceptives, specifically relating to questions of blood clots, stroke, and heart attack that saw the most improvements. The results also aligned with previous research, which showed gaps in cardiovascular disease preventative efforts in young women (Chaturvedi et al., 2016). African American women ages 20–40 lack the knowledge of oral contraceptive risks as it pertains to stroke and heart disease. It also showed that despite 40.6% of participants holding a graduate degree (see Table 2), there were still knowledge gaps. The pretest and posttest can infer the training regarding oral contraceptives and stroke prevention did show a significantly positive effect in the participant's overall knowledge of the possible health consequences for using oral contraceptives related to stroke. It can be inferred that participants received knowledge to make more informed decisions regarding the safest birth control based on their risk factors. It can also be inferred African American women ages 20–40 lacked education on stroke and heart disease

and need reinforced education regarding risk factors, signs, and symptoms as a means of prevention.

Chapter Summary

A quantitative research study was performed to determine the effectiveness of an intervention. The intervention was replicated from previous research studies to answer the PICOT question: Will implementing evidence-based education increase awareness of stroke in oral contraceptive use of African American women ages 20–40? A smaller sample size of 69 was confirmed through power analysis and reliable enough to gather necessary data. A Fisher's exact test proved a significant increase in participant knowledge after receiving oral contraceptives and stroke education. A confidence interval of 95% revealed the accuracy of research results (Kellar & Kelvin, 2013). Although most participants held graduate degrees, it was revealed that a knowledge deficit existed as it pertained to oral contraceptive use and stroke.

Chapter 5: Discussion, Conclusions, and Recommendations

The oral contraceptive and stroke education was effectively implemented. There were some changes made with increasing the inclusion criteria to allow those in their 20s and those who have ever utilized oral contraceptive to participate. The goal to increase awareness in this patient population was necessary, as 90% of women have at least one risk factor of heart disease or stroke (ASA, 2020). Previous research assessing participants' knowledge of oral contraception noted an increase in the mechanism of action and effectiveness, whereas this study showed the most improvement with risks such as blood clots, stroke, and heart attack (Hall et al., 2013).

Although there were changes in the sample size, it was appropriate based on the power analysis two-tailed test that proved a difference between means of 1.77, a $SD = 2.665$, and 0.05 alpha, which confirmed 95% accuracy in the data analyzed. The oral contraceptive and stroke education analysis was based on a paired sample t test, which showed a significant difference of 5.707 between the pretest and posttest participants took. This signifies strong evidence and effectiveness of oral contraceptive and stroke education. The data also proved that despite participants' educational attainment, there were gaps in knowledge requiring intervention (Kellar & Kelvin, 2013).

The most significant increases in knowledge noted was in the use of oral contraceptive question number 14, which asked participants if they have trouble breathing would they call their doctor immediately, discuss it at their next visit, or not tell? There was a 124-point increase posteducation with participants knowing the importance of contacting their doctor immediately if exhibiting difficulty breathing (see Tables 12 and 13).

Table 12*Contingency Table for Responses to Question 14: Cross-Tabulation*

	Incorrect	Correct	Total
Pretest	5	64	69
Posttest	2	67	69
Total	7	131	138

Note. Question 14 asked participants if they had trouble breathing would they call the doctor immediately, discuss at their next visit, or not tell?

Table 13*Contingency Table for Responses to Question 14: Chi-Square Tests*

	Value	Asymptotic Significance (two-sided)	Exact Sig. (two-sided)	Exact Sig. (one-sided)
Pearson chi-square	1.354	.245		
Fisher's exact test			.441	.220

Based on the results, participants scored very high in the risk for the blood clots question. The participants showed an increase of 104 points between the pretest and posttest when questioned about the risk for blood clots while taking oral contraceptives (see Tables 14 and 15). There was a score improvement noted in the question regarding oral contraceptives and increases in stroke risk. The risk for stroke knowledge increased by 98 points, proving a better understanding of participant risks of acquiring blood clots and stroke while on oral contraceptives (see Tables 16 and 17).

Table 14*Contingency Table for Responses to Question 8: Cross-Tabulation*

	Incorrect	Correct	Total
Pretest	14	55	69
Posttest	3	66	69
Total	17	121	138

Note. The question asked participants if the pill increases, decreases, or has no effect on the risk of blood clots?

Table 15*Contingency Table for Responses to Question 8: Chi-Square Tests*

	Value	Asymptotic Significance (two-sided)	Exact Sig. (two-sided)	Exact Sig. (one-sided)
Pearson chi-square	8.118	.004		
Fisher's exact test			.008	.004

Table 16*Contingency Table for Responses to Question 9: Cross-Tabulation*

	Incorrect	Correct	Total
Pretest	17	52	69
Posttest	3	66	69
Total	20	118	138

Note. Question 9 asked participants if the pill increased, decreased, or had no effect on the risk of stroke.

Table 17*Contingency Table for Responses to Question 9: Chi-Square Tests*

	Value	Asymptotic Significance (two-sided)	Exact Sig. (two-sided)	Exact Sig. (one-sided)
Pearson chi-square	11.461	.001		
Fisher's exact test			.001	.001

Participants also showed an increase in understanding hormones in the pill and how it affects their bodies. Results revealed a 92 point increase of knowledge in the pill's hormonal content (see Tables 10 and 11). The 92 point increase of knowledge noted in understanding hormones in the pill are like those made in a woman's body (see Tables 10 and 11). The oral contraceptive and stroke education provided participants with an enhanced knowledge of what they are taking or have taken in the past.

Participants were also noted to have an increase in knowledge regarding the use of oral contraceptives. There was an 86 point increase in scores regarding leg pain and swelling. The women showed a better understanding of notifying their provider when they are exhibiting leg pain or swelling (see Tables 18 and 19).

Table 18

Contingency Table for Responses to Question 12: Cross-Tabulation

	Incorrect	Correct	Total
Pretest	19	50	69
Posttest	7	62	69
Total	26	112	138

Note. Question 12 asked participants if they had leg pain or swelling, what would they do?

Table 19

Contingency Table for Responses to Question 12: Chi-Square Tests

	Value	Asymptotic Significance (two-sided)	Exact Sig. (two-sided)	Exact Sig. (one-sided)
Pearson chi-square	6.824	.009		
Fisher's exact test			.015	.008

Implications of Analysis for Leaders

Regardless of the patient's educational attainment, the research proves previous or current use of oral contraceptives that participants lack the knowledge of the mechanisms of action, use, risks, and benefits. Healthcare providers have due diligence in ensuring that patients are informed adequately before prescribing medications. Also, providers must be looking at the patient. Holistically viewing the patient would include taking time to review risk factors and working with the patient to make informed decisions on safely using oral contraceptives.

As a secondary prevention measure, providers and patients would benefit from ensuring that adequate information is disseminated to women upon prescribing oral contraceptives. Providing appropriate education for patients could decrease risk factors and improve stroke incidence in this population. With 80% of strokes being preventable, the oral contraceptive stroke education session could reduce the incidence of stroke (ASA, 2020). Educating this high-risk population will aid in promoting health and wellness. This will also empower African American women to not only get involved in their care but also advocate for themselves when they are experiencing any symptoms. These are all vital elements of implementing Martha Rogers' unitary theoretical framework at the bedside. Incorporating this theoretical framework will address the knowledge gaps noted in the research while providing holistic and competent patient-centered care (Nursing Theory, 2016).

Essentials of Doctoral Education for Advanced Practice Nurses

Essential I: Scientific Underpinnings

Stroke among African American women is a significant concern. It is concerning because most African American women are not aware of their risk factors. In doing this research, it was noted that this patient population lacked the knowledge requiring them to make informed health

decisions. The results also indicated a lack of holistic patient-centered care. As a DNP graduate, it is key to ensure the development and implementation of policy into practice, incorporating Rogers' unitary health model. Providers viewing the patient holistically and inclusive of their healthcare are necessary to mitigating healthcare disparities (Nursing Theory, 2016). Patient care is not to be limited to assessing, diagnosing, planning, implementing, evaluating, and educating—holistic patient care is inclusive in educating and collaborating efforts between the provider and patient.

Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking

Improving quality patient care can be done through the utilization of evidence-based research. Performing ongoing research will be crucial to improving quality care and specifically those in high-risk and underserved populations. This quality improvement project was created based on my personal experiences and the need to educate and advocate for African American women. Understanding the risk African American women ages 20–40 have as it pertains to stroke and the risks of oral contraceptive use was limited in the research and would require ongoing investigation. Developing a risk factor algorithm for this patient population based on past evidence-based research could be pivotal for providers and patients.

Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice

The research results acquired in this project can aid in improving prescribing practices. Providers can utilize this evidence-based data to enhance their prescribing techniques to include more education of medications, including use, risks, and benefits. Doctor of Nursing Practice graduates performing evidence-based outcome projects can enhance the practices at the bedside.

The analyzed data can also guide the necessary policy change to practice while improving health disparities among high-risk populations.

Essential IV: Information Systems, Technology, and Patient Care Technology for the Improvement and Transformation of Health Care

Since the wake of the COVID-19 pandemic, healthcare has seen a shift in patient care delivery. Technology has taken the forefront in implementing patient care. The most common format would be utilizing telecommunication, such as Zoom conferencing, to educate and disseminate information. Teleconferencing was most effective for disseminating information and reaching participants in a timely fashion. This was the most beneficial and effective for this quality improvement project. It was also a convenient means of capturing this high-risk patient population. Evolving healthcare requires DNP graduates to stay up to date with technological advances to provide safe, quality patient care.

Essential V: Healthcare Policy for Advocacy in Healthcare

Results from this quality improvement outcome project indicated the need for educating patients on the mechanisms of action, use, and risks of oral contraceptives. It also showed the need to implement additional measures, such as risk factor algorithms, to identify those at high risk. As a nursing leader, a DNP graduate will have the ability to create and implement this necessary tool at the bedside to reduce risk factors and the incidence of stroke in this patient population.

Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes

Doctor of Nursing Practice graduates work collaboratively with other healthcare professionals to improve the patient's quality of care. This quality improvement project required

a collaborative effort between me, nursing faculty, statistician, and participants. The leadership skills acquired as DNP graduates will enable one to work in this evolving world of healthcare. Nursing leaders can provide patient-centered care and improve outcomes by disseminating more quantitative research projects such as this.

Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health

Stroke carries a heavy burden on patients and families. It has become more prevalent among young adults and accounted for \$17.9 million in one year (Tong et al., 2019). Knowledge and preventative care will be vital in addressing the two to three times higher incidence of stroke in African American women (ASA, 2020); knowledge preventative care is vital. To address the disparities, it will require DNP graduates to utilize their knowledge of epidemiology and statistics to understand disease processes better as it pertains to the community and population's health. Doctor of Nursing Practice graduates are trained to be diverse in their learning and clinical practice. Providing disease prevention through education and screenings can bridge the knowledge gaps and healthcare disparities in African American women.

Essential VIII: Advanced Nursing Practice

Competent nursing leaders in specialty areas such as community health settings are necessary to provide reasonable, safe patient care. Collecting and analyzing data can guide practitioners in designing protocols based on evidence-based practice. Implementation of quality outcome projects into practice will guide and advanced practitioners to make appropriate clinical judgments. Implementing necessary policy changes such as risk factor algorithms can address knowledge gaps and improve patient outcomes.

Recommendations for Future Research

Women use oral contraceptives for a variety of reasons. Reasons can range from family planning, hormone regulation, to menstrual pain. On average, more than 50% of women using oral contraceptives are African American (Daniels & Abma, 2018). With such a large portion of this high-risk population utilizing oral contraceptives, they still face a knowledge deficit. African American women ages 30 and up are the number one cause of death related to heart disease and stroke (ASA, 2020). The mean age of participants completing this research was 31; this is alarming as 80% of strokes are preventable (ASA, 2020). Our patient's health is at stake and needs intervention to rectify and mitigate further health disparities. Future research would be necessary to understand why African American women ages 20–40 are being prescribed oral contraceptives without proper education. More research should be done to understand better how providers are prescribing oral contraceptives. Additionally, performing research to include providers and understand why these women are not adequately educated before prescribing oral contraceptives would be warranted based on this study's results. Implementing a brief educational session upon prescribing and reinforcing usage at subsequent visits may be beneficial.

Additional research needs to be completed on stroke as it relates to contraceptives. The knowledge deficit identified in this research proves there is a need for future investigation on the topic. Roughly 90% of women have at least one risk factor for heart disease or stroke (ASA, 2020). A recommendation for implementing an evidence-based algorithm of risk factors to determine if a woman would be the right candidate for oral contraceptives would be beneficial in not only educating but also decreasing incidences. Current prescribing recommendations are based on blood pressure, diabetes, age, and smoking. Reviewing the patient holistically and

understanding her reasoning for oral contraceptive use would benefit both the patient and provider. Doctor of Nursing Practice graduates can provide evidence-based outcomes research to implement at the bedside to enhance knowledge and improve health disparities while reducing incidence.

Implementing this research into evidence-based practice would allow providers to capture those knowledge deficits about oral contraceptive use. Patients could become more involved with their care and have mutual partnering with their providers to make informed decisions. It will also increase awareness of increased risk factors in this patient population for providers to focus on alternative contraceptives. Clinical practice may need to include lab testing of hormone levels (i.e., estrogen and progesterone) as it has been found that combination hormone therapy poses the highest risk of blood clots, stroke, and heart attack (Schuiling & Likis, 2013).

Incorporating lab testing of estrogen and progesterone levels before prescribing may mitigate the increased risk of vascular incidents in this high-risk population. Another lab test to consider is the inclusion of D-dimer as a predictor test for women using oral contraceptives. D-dimer is a lab test for clot formation. Research has shown it to be a coagulation biomarker and higher in African Americans (Raffield et al., 2017). Research data would need to include contraceptives of all types to determine any knowledge deficits or stroke incidence (Camara et al., 2017). Including other contraceptive use and stroke would give a more concise picture of overall contraceptive knowledge and its effects. Other research data noted gaps in preventative efforts for cardiovascular disease in young women. It was also suggested to implement the cardiovascular index risk factor indicator as a vascular disease prevention assessment tool when prescribing oral contraceptives to this patient population (Chaturvedi et al., 2016).

Chapter Summary

Despite the smaller sample size $N = 69$, the oral contraceptive knowledge tool pretest showed participants were deficit in the necessary information on understanding oral contraceptive use, side effects, and risks. Utilizing the Fisher's exact test for reliability was most effective in obtaining accurate pretest and posttest results (Kellar & Kelvin, 2013). The oral contraceptive stroke education session was proven to be a positive intervention. There was a knowledge increase noted with the most improvements in two areas: risk and use of oral contraceptives.

Participants are now more aware that oral contraceptives can cause blood clots, stroke, and heart attacks and are aware of their signs and symptoms (see Tables 10, 12, 14, 16, 18, 20, and 21). Participants also have a better understanding of what oral contraceptives contain and how it affects their bodies. The intervention can enable African American women ages 20–40 to make more informed decisions about oral contraceptives. Providers will need to be vigilant with incorporating more education before prescribing oral contraceptives. Reiteration of risk factors as it pertains to oral contraceptives and stroke may also be necessary. Additionally, incorporating hormone-level testing before prescribing oral contraceptives is another vital component. These secondary prevention tools can guide providers in reducing the incidence of stroke in this high-risk population. To improve patient outcomes, providers will need to continue to educate themselves and patients. Healthcare professionals can be collaborative with patients by empowering them with an adequate education. The use of technology in research can help reach patients at all levels and specifically those in the high-risk populations. Ongoing research will be necessary for policy change and implementation for the enhancement of care at the bedside.

Table 20*Contingency Table for Responses to Question 10: Cross-Tabulation*

	Incorrect	Correct	Total
Pretest	25	44	69
Posttest	7	62	69
Total	32	106	138

Note. Question 10 asked participants if the pill increases, decreases, or has no effect on the risk of heart attack.

Table 21*Contingency Table for Responses to Question 10: Chi-Square Tests*

	Value	Asymptotic Significance (two-sided)	Exact Sig. (two-sided)	Exact Sig. (one-sided)
Pearson chi-square	13.182	.000		
Fisher's exact test			.000	.000

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Appendix A: Permission to Use Questionnaire

Article I. Permission to use the tool

Dec 19,
2018, 3:35
PM

To Kelli

Dr. Hall,

Thanks for your speedy response. I am referring to your 2013 research in which you utilized the 41-item knowledge questionnaire. My focus would be more on MOA and side effects. I would also like to implement the educational text messaging or email as a tool to determine pre and post education for participants.



Article II. Hall, Kelli < >

Dec 19,
2018, 4:50
PM

To me

Thanks for clarifying! Sure you have my permission. Good luck with your project!
Kelli

Sent from my iPhone

Appendix B: Stroke Prevention and OC Knowledge Questionnaire

1. The pill has either a combination of estrogen and progestin or progestin only.

True

False

Don't know

Not related

2. The pill contains hormones that are very different from those made by a woman's body.

True

False

Don't know

Not related

3. Please select whether you think the pill makes each symptom better, worse, or has no effect.

ACNE

Better

Worse

No effect

Don't know

Not related

4. Please select whether you think the pill makes each symptom better, worse, or has no effect.

Menstrual cramps

Better

Worse

No effect

Don't know

Not related

5. Please select whether you think the pill makes each symptom better, worse, or has no effect.

Irregular periods

Better

Worse

No effect

Don't know

Not related

6. Please select whether you think the pill makes each symptom better, worse, or has no effect.

Heavy periods

Better

Worse

No effect

Don't know

Not related

7. Please select whether you think the pill makes each symptom better, worse, or has no effect.

Weight gain

Better

Worse

No effect

Don't know

Not related

8. Please describe what you think each of the following conditions is in your own words. Then select whether you think the pill makes each condition increase, decrease, or has no effect.

Blood clots are...

9. The pill increases, decreases, or has no effect on the risk of blood clots?

Increases

Decreases

No effect

Don't know

Not related

10. Stroke is...

11. The pill increases, decreases, or has no effect on the risk of stroke?

Increases

Decreases

No effect

Don't know

Not related

12. Heart attack is...

13. The pill increases, decreases, or has no effect on the risk of heart attack?

Increases

Decreases

No effect

Don't know

Not related

14. For each health problem, select what you would do about taking the pill (stop or continue) and about telling your doctor (call immediately, discuss at next visit, or not tell).

Leg pain or swelling

Stop taking

Continue taking

Don't know

Not related

15. If you have leg pain or swelling, what would you do?

Call my doctor immediately

Discuss at next visit

Not tell

Don't know

Not related

16. If you have trouble breathing, would you...

Stop taking

Continue taking

Don't know

Not related

17. If you have trouble breathing, would you...

Call my doctor immediately

Discuss at the next visit

Not tell

Don't know

Not related

18. If you had chest pain, would you...

Stop taking

Continue taking

Don't know

Not related

19. If you had chest pain, would you...

Call your doctor immediately

Discuss at next visit

Not tell

Appendix C: Permission to Use Questionnaire Tool

Article III. Permission to use partial tool

Fri, Mar 6,
1:01 PM

To Kelli

Dr. Hall,

I was wondering if I could get permission to utilize 13 of your questions (78 c, g, I; 79 a, b, c, d, & e; 80 b, d, h, I; 81 b, c, e. My PICO is Stroke Prevention in AA women ages 30–40 using oral contraceptives, and I am trying to narrow the questions down to my specific topic. I have a statistician that will run the reliability of using fewer questions but wanted to get your permission. Would you be okay with my utilizing the questions that pertain to stroke/heart disease?

Respectfully,

[Ashanti L.N. Coleman, MSN, APRN,FNP-c](#)

Fri, Mar 6,
1:13 PM

To me

Yes

Appendix D: Expert Review

On March 11, 2020, three experts reviewed questions from the original oral contraceptive knowledge questionnaire, and based on clinical expertise, agreed the 13 questions selected were the most appropriate for this research project. These have been approved by Dr. Katosha Muse, a primary care and obstetrician in her own practice in Memphis, Tennessee, Dr. Karen Green an emergency room physician in a local hospital in Ohio, and Crystal Shotwell, APRN FNP-c, a women's health physician in labor and delivery at a facility in Memphis, Tennessee. Contact information is available upon request.

Appendix E: IRB Approval

ABILENE CHRISTIAN UNIVERSITY

Educating Students for Christian Service and Leadership Throughout the World

Office of Research and Sponsored Programs
320 Hardin Administration Building, ACU Box 29103, Abilene, Texas 79699-9103
325-674-2885



May 15, 2020

Ashanti Coleman
Department of Nursing
Abilene Christian University

Dear Ashanti,

On behalf of the Institutional Review Board, I am pleased to inform you that your project titled "Stroke Prevention in AA Women Ages 30-40 Using Oral Contraceptives",

(IRB# 20-057) is exempt from review under Federal Policy for the Protection of Human Subjects.

If at any time the details of this project change, please resubmit to the IRB so the committee can determine whether or not the exempt status is still applicable.

I wish you well with your work.

Sincerely,

Megan Roth

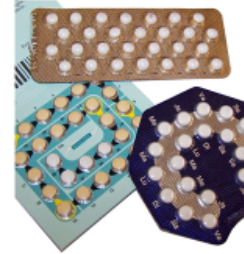
Megan Roth, Ph.D.
Director of Research and Sponsored Programs

Appendix F: Stroke Prevention Educational Session (PowerPoint Presentation)

Stroke Prevention educational session.pptx

Stroke Prevention in AA Women ages 20-40 using oral contraceptives

Ashanti L.N. Coleman, MSN, APRN,
FNP-c, DNPS



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Appendix G: Study Timeline

Task Date	Task
May 2018	Engage facility site to coordinate affiliation agreement
May 2018	Develop theoretical framework
May 2018	Choose study measurement tool; validate permission to use (in writing)
July 2018	Develop PICOT question
December 2018	Select project chair and engage in first meeting
July 2019	Deadline for obtaining official support letter from facility. Upload to NURS 755
March 2019	Secure chair and committee members, finalize formation of committee form and upload to NURS 755
April 2019	Complete Chapter 1 of scholarly project and provide to committee for feedback
January 2019	Complete Chapters 2–3 of scholarly project
August 2019	Revise and finalize chapters one through three. Submit to committee for final approval
October 2019	Coordinate proposal defense date with committee and submit formal defense form
October–November 2019	Mid program review: ensure compliance with e-portfolio regulations, clinical log review, prepare for proposal defense
August–September 2019	Continue preparation for proposal defense
September–October 2019	Proposal defense
November–December 2019	Work on IRB proposal and edits required
January–February 2020	Working on IRB proposals and edits
April–May 2020	IRB approval

May–July 2020	Implementing project to recruit participants
June–July 2020	Participants engage in study
July–August 2020	Submission of data to statistician for assistance with Excel formatting, upload data to SPSS for analysis
August–September 2020	Continued revisions of Chapters 1–3 and draft of 4–5
October–December 2020	Editor review of final draft of Chapters 1–5 through. DNP final defense