

**Improving Cervical Cancer Screening Rates and Utilization of Evidence-Based Treatment**

**Guidelines at a Rural Primary Care Clinic**

THE DNP SCHOLARLY PROJECT  
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## **Abstract**

Cancer is the second leading cause of death in the United States, exceeded only by heart disease; one of every four deaths in the United States is due to cancer (Center for Disease Control and Prevention, 2018). Cervical cancer is the fourth most common cancer in women, leading to an estimated 528,000 cases and 266,000 deaths worldwide in 2012(Campos et al., 2016). Cervical cancer screening through the Papanicolaou (Pap) test is an effective means of detecting precancerous cell changes within the transformational zone of the cervix and reducing the incidence of cervical cancer in the asymptomatic stage (Everett et al., 2014).

**Purpose & Objective:** This quality improvement project is intended to increase the rate of cervical cancer screening by introducing a home human papilloma virus (HPV) testing option with increased patient education and to standardize the utilization of the 2019 American Society for Colposcopy and Cervical Pathology (ASCCP) guideline in a primary care setting.

**Method:** Evidence-based interventions implemented included providing an option for home HPV testing with augmented teaching and a workflow change to ensure ASCCP guidelines are followed to manage abnormal results. Data analyses were done utilizing a run chart, descriptive statistics, and a Chi-square test to analyze changes in pre-and postintervention outcomes.

**Result:** Findings showed a 46% increase in postproject cervical cancer screening rates at the facility compared to the preintervention phase of the project. Increased providers' adherence to ASCCP guidelines in managing abnormal cervical cancer screening result noted postintervention.

## **Improving Cervical Cancer Screening Rates and Utilization of Evidence-Based Treatment Guidelines at a Rural Primary Care Clinic**

### **Section 1: Introduction to the Problem**

Cervical cancer is the fourth most common cancer in women, leading to an estimated 528,000 cases and 266,000 deaths worldwide in 2012 (Campos et al., 2016). In 2018 the CDC reported 12,733 cervical cancer diagnoses and 4,138 deaths in the United States (CDC, 2018).

Approximately 85% of cases and deaths occur in low-income countries and communities, often affecting middle-aged women and varying by social and economic stability (LaVigne et al., 2017). Women living in medically underserved communities are experiencing disparity in cervical cancer occurrence and death, mainly due to inadequate compliance with timely cervical cancer screening.

Although increased awareness of early cervical cancer diagnosis and perception have reduced this disease's incidence, prevalence, and mortality rate among US women, incidence and mortality rates remain high in specific population subgroups (CDC, 2016). Poor compliance with cervical cancer screening among medically underserved populations has resulted from lack of insurance, healthcare inaccessibility, lack of knowledge, and cultural belief regarding disease prevention (Bharel et al., 2015).

Cervical cancer screening through Papanicolaou (Pap) testing is an effective means of detecting precancerous cell changes within the transformational zone of the cervix and detecting cervical cancer in the asymptomatic stage (Everett et al., 2014). The target of Healthy People 2030 is to increase the cervical cancer screening compliance rate from 80% as of 2020 to more than 85% by 2030 (US Department of Health and Human Services, 2020).

## **Practice Setting**

This DNP project's setting was a privately-owned primary care practice located in a rural community in Houston, Texas. The practice sees about 60 patients daily, from pediatrics to geriatrics. More than 90% of the patient population comprises minorities of low socioeconomic status. There are two providers at the facility, including the nurse practitioner, and each sees a certain number of patients each day.

## **Target Population**

The target population for the project consists of female patients aged 21-65 years who routinely sought care at the facility within the project timeframe and qualify for cervical cancer screening based on the US Preventive Services Task Force (USPSTF) guidelines. A previous history of cervical cancer excluded patients from the study.

## **Needs Assessment**

In 2016, 76% of Texas women ages 21-65 years self-reported receiving a Pap test in the past 3 years, which was less than the self-reported screening rate for the US overall (80%). In 2019, it was estimated that 1,395 new cases of cervical cancer would be diagnosed in Texas (Texas Department of State Health Services, 2019). Women living in rural communities tend to experience barriers to optimal cervical cancer prevention, early detection, and treatment. Overall, cervical cancer incidence and mortality rates are higher in rural and nonmetropolitan areas than in metropolitan areas, with studies demonstrating lower use of screening services in rural communities (Caldwell et al., 2016).

After a detailed review of the facility's charts and the Healthcare Effectiveness Data and Information Set (HEDIS) measurement score report, it was noted that the facility was at a 23% compliance rate, which is far below the 76% reported for Texas. The in-house survey study and

need assessment indicated that several barriers were responsible for inadequate cervical cancer screening compliance among this patient population. The HEDIS consists of sets of quality performance measures determined by the National Committee for Quality Assurance (MacLeod et al., 2018).

## **SWOT Analysis**

### ***Strengths***

#### **Increased Coverage Rate Through Medicaid for Women Living in the Community.**

About 90% of women living in the community either do not work or do not make enough income, thereby qualifying them for Medicaid (Blanchard, 2014). Medicaid is a federal system of health insurance for those requiring financial assistance. This eliminates the challenges of paying for cervical cancer screening out of pocket for women who have Medicaid living in the community.

#### **Availability of More Appropriate Screening Supplies at the Clinic.**

The Pap smear (cytology) is the screening test that has been shown to reduce the incidence of cervical cancer and its associated mortality. In recent years, screening equipment has improved to include the HPV DNA test and other sexually transmitted diseases. Evidence from randomized clinical trials (RCTs) and decision modeling studies suggest that the cytology screening alone is slightly less sensitive for detecting cervical intraepithelial neoplasia grade 2 and 3 than screening for high-risk human papillomavirus (Melnikow et al., 2018).

#### **Availability of Female Providers to Perform the Cervical Cancer Screening Test.**

At the project facility, the lone provider before the DNP project leader joined the practice was a male, and it was noted that most women do not feel comfortable having a male provider perform their Pap smear. This was one of the reasons some of the reported for not being up to date with their cervical cancer screening in the past 5 years. A woman joining the practice became an avenue to improve cervical cancer screening metrics at the clinic. Most women interviewed indicated a willingness to have a female provider perform their Pap smears. In other studies, most women have expressed a preference for a female provider irrespective of their ethnicity, as they were more comfortable discussing a Pap test and having an examination with a female provider (Ferdous et al., 2018).

### ***Weaknesses***

#### **Lack of Funding for the Uninsured.**

One of the weaknesses associated with decreased compliance with cervical cancer screening at the practice facility was the lack of government funding to cover patients without medical insurance. The clinic does not receive financial support or funding from the government; thus, it is impossible to offer free cervical cancer screening to women without insurance. The current screening rate for insured patients was 86.9%, while the rate for uninsured women was 68.2% (Price et al., 2020).

#### **Inadequate Patient Education and Sensitization on the Importance of Cervical Cancer Screening.**

Due to the volume of the clinic workflow, most women reported lack of time to receive extensive education on the benefits and importance of cervical cancer screening. This indicates

that women between the ages of 21-65 years do not get adequate education and sensitization regarding cervical cancer screening.

### **Lack of Female Healthcare Provider**

The clinic has lacked female providers in the past 10 years that it has been operational. This was noted as one of the contributory factors leading to decreased cervical cancer screening compliance among women aged 21-65 living in the community. Most women expressed a preference for a female provider irrespective of their ethnicity, as they were more comfortable discussing a Pap test and having an examination with a female provider (Ferdous et al., 2018).

### **Equipment/Staff Shortages.**

Equipment and screening supplies shortages also posed a threat to providing cervical cancer screening. The ongoing COVID-19 pandemic caused a supply chain delay and shortage of most medical equipment and supplies. Unpredictable staff absences were another threat noted; when the facility is not well staffed, most of the scheduled screenings were canceled by the office manager and rescheduled for a later date.

### **Male Providers' Reluctance to Screen.**

During the analysis, it was noted that male providers in the clinic were not comfortable performing Pap smears due to personal beliefs and preferences. This led to inadequate recommendations for the screening test for women aged of 21- 65 years.

### ***Opportunities***

#### **Clinical Implications for Education and Awareness.**

The noted CCS gap exposed the need for patients' engagement and education, which will help create awareness among women living in the community, thereby increasing their cervical cancer screening compliance rate.

### **Improve the Rate of Early Diagnosis and Treatment of Cervical Cancer.**

Timely cervical cancer screening for women living in medically underserved communities will improve the rate of early diagnosis and treatment of cervical cancer. With appropriate implementation of the 2019 ASCCP guidelines, cervical cancers can be detected at an early stage for a better treatment outcome, thereby reducing the financial and emotional burden associated with late diagnosis and treatment of cervical cancer. The critical responsibility of a community family practice is to provide essential healthcare services, including disease prevention, healthcare, and health education (Castrucci, 2021).

### **Increase Awareness of the Importance of Cervical Cancer Screening.**

A noted lack of adequate knowledge of cervical cancer screening among the female patients interviewed created an opportunity for community outreach and awareness of timely cervical cancer screening benefits. With acquisition of knowledge, patients are empowered to ask pertinent questions related to cervical cancer prevention (Limmer et al., 2014). The educational need noted in this project was addressed by placing CCS information posters at the waiting area and exam rooms and providing CCS education to female patients during every encounter at the project site.

### ***Threats***

#### **Cultural and Religious Beliefs Impacting Compliance.**

Most of the female patients interviewed stated that they did not feel comfortable being exposed during the examination and Pap process due to their cultural and religious beliefs. The female patients believed that CCS somehow intrudes upon their privacy and dignity as women.

#### **Outbreak of COVID-19 Influenced Patient Compliance.**

Due to the outbreak of COVID-19, most women were scared to visit the doctor's office for their screening test for fear of contracting the infectious disease, which led to decreased compliance for most women living in the community. With the COVID-19 pandemic, many preventive screenings were canceled or postponed, leaving many patients without access to recommended healthcare services (Cancino et al.,2020).

#### **Low Socioeconomic Status and Income Among Women living in the Community.**

Despite the Medicaid coverage for cervical cancer screening for most women living in the community, most women still found CCS costly due to the incidental expenses and difficulties of transportation and childcare. Most female patients from this socioeconomic background earn their income from hourly wages; therefore, time off work to visit healthcare provider for screening results in loss of income.

#### **Low Level of Education Among Women living in the Community.**

Due to their level of illiteracy, the patients' lack of adequate knowledge and understanding of CCS posed a significant challenge to compliance within the community. Some of the patients were not able to fluently communicate their concerns about the CCS due to their low educational level.

Overall, the analysis of the need assessment findings among women aged 21-65 at the project site indicated that adequate CCS compliance can be influenced by internal factors (strengths and weaknesses) and external factors (opportunities and threats). However, to improve CCS within the community of study, multistrategy action needs to be considered to build up advantages, utilize opportunities, mitigate weakness, and face flaws. These could be achieved through routine patient education, collaboration with all providers, and a system in which where every female patient between the ages of 21 and 65 has a Pap smear every 3 years.

### **Inquiry Question**

Among women aged 21-65 presenting to a primary care clinic, how does a standardized CCS workflow process, and the addition of a home HPV testing option with augmented patient education, impact CCS rates and referrals for definitive management per the ASCCP guidelines, compared to the current practice?

### **PICOT Question**

PICOT is an acronym for population (P), intervention (I), comparison (C), outcome (O) and timeframe (T). The PICOT method helps guide, articulate, and narrow project practice transformation and delivers the timeline for a short-term project (Melnyk et al., 2019).

- **Population:** Female patients aged 21- 65 years presenting for healthcare services at a rural primary care clinic
- **Intervention:** Standardizing the CCS workflow process and use of 2019 ASCCP treatment guidelines, with the addition of a home HPV testing option and increased patient education

- **Comparison:** Current practice includes inconsistent utilization of ASCCP 2019 guideline; and no home HPV testing option
- **Outcome:** Increased cervical cancer screening rates, and number of referrals for treatment or colposcopy
- **Timeframe:** Over 3 months

### **Purpose/Aim(s)**

The project is intended to increase the rate of CCS among female patients aged 21- 65 and standardize the workflow process utilizing 2019 ASCCP guidelines in a primary care setting. The home testing option should increase patient education and utilizing 2019 ASCCP guidelines should increase the opportunity for early detection, improve the quality of health for women living in the community, and improve organizational quality measures. A secondary goal is to improve the facility's quality compliance indicators with preventive screening, specifically cervical cancer screening rates.

### **Theoretical Framework: Nola Pender's Health Promotion Model**

The theoretical framework and concept used for the project are Pender's Health Promotion Model (HPM), a nursing model that assists in predicting health behavior and how it correlates with the early detection and prevention of disease (Nursing Theory, 2016). The focus of this model is to increase patients' well-being by improving healthy lifestyles and detecting critical components related to health behaviors. This HPM describes how humans interact with their environment to meet health goals and three groups that determine health behavior. These groups include individual characteristics, behavior-specific cognitions, and immediate behavioral

contingencies. The HPM makes four assumptions: individuals seek to regulate behavior; individuals interact with and transform their environment; health professionals are a part of the interpersonal environment, which influences people throughout life; and self-initiated reconfiguration of person-environment interactive patterns is essential (Nursing Theory, 2016).

### ***Application to practice change***

The third assumption of the HPM model is that health professionals influence patients' behavior throughout life by mediating their interpersonal environment. Using this theory for the DNP project is intended to increase health promotion screening, which will improve the patients' overall well-being. This statement and assumptions are the foundation of this DNP project because healthcare providers' interventions will improve women's health outcomes through increasing patient awareness about cervical cancer screening and create an opportunity for early detection of cervical cancer through timely referral of abnormal CCS results for definitive diagnosis.

## **Section II: Presentation of the Evidence and Literature Review**

### **Search Strategy**

The literature review of the problem consisted of database searches including PubMed, EBSCO, and CINAHL. The keywords were related to CCS compliance among women living in underserved communities. The specific search words are "*uterine neoplasm,*" "*increased adherence,*" "*underserved population,*" "*cervical cancer screening,*" "*underserved areas,*" and "*abnormal result management guidelines.*" These search keywords provided several general articles, and limiters were used to filter and streamline the search. The search strategy and results were analyzed based on the databases used.

In the CINAHL database, the term "*cervical cancer screening*" yielded 910 results. When the "*underserved community*" was added "*cervical cancer screening*," 9 results were found. When "*ASCCP guideline adherence*," was added, it produced 28 results.

An advanced search in the PubMed database was used, and the MESH terms field was selected. Using the terms "*uterine neoplasm*" alone yielded 1307 results, and when added with the phrase "*screening adherence*," it generated 822 results. When changed from "*underserved areas*" to "*uterine neoplasm*" AND *screening adherence*," all together yielded a total of 22 results.

Using the term "*cervical cancer screening*" alone yielded 83 results in the EBSCO database. When the search term "*evidenced-based interventions*" was added to the initial search term of "*cervical cancer screening*," it generated 12 results. When added the "*underserved population*" search term to "*cervical cancer screening*" and "*evidence-based intervention*," altogether yielded seven articles.

Overall, 13 articles relevant to the project topic were selected and used for the project.

### ***Inclusion and exclusion criteria***

Inclusion criteria were articles in English, dated 2013- 2021, that were peer-reviewed with evidence-based data. Academic papers and research articles, clinical guidelines, and national guideline recommendations were included. Exclusion criteria were articles in a language other than English, dated before 2013, having poor quality of evidence, and/or not articles not specific to cervical cancer screening.

## **Levels of Evidence**

Thirteen studies met the criteria for best evidence on the project topic. Each article was appraised using two John Hopkins Nursing Evidence-Based Practice (JHNEBP) appraisal tools and the Hierarchy of Scientific Evidence model, which ranks study types based on the strength and precision of their research methods (Murad et al., 2016); see Appendix D). These tools were used based on their direct and specific applicability to numerous research and nonresearched evidence types. All the articles were reviewed using the JHNEBP appraisal tools and received strength-of-evidence and quality rating scores. The JHNEBP evidence appraisal tool categorized evidence into five strata. The first level constitutes the most substantial level of evidence and includes randomized controlled trials or meta-analyses of randomized control trials. The second level comprises quasi-experimental studies whereby independent variables are manipulated. The third level is composed of nonexperimental and qualitative analyses and meta-syntheses of qualitative research. Level four includes systematic reviews, which summarize research studies about a specific topic. Level four also contains clinical practice guidelines that synthesize research and clinical practice data. The fifth level comprises organizational studies for quality improvement or financial analysis and includes expert opinions, literature reviews, and case studies that are nonresearch-based.

## **Critical Appraisal**

The DNP student critically analyzed and appraised each of the 13 articles chosen. Based on their evidence level, the critical evaluation showed four systematic review articles (level I), seven randomized control trials articles (level II), and two qualitative & pilot study articles (level III).

## **Synthesis of Literature**

Based on the keywords used in the search databases, the selected articles showed evidence-based outcomes on interventions that have led to increased cervical cancer screening compliance among women living in underserved communities. The interventions used in the studies/articles showed similarities to the proposed project's intervention strategies. These interventions include introducing home HPV testing with augmented patient education and implementing the 2019 ASCCP guidelines.

Out of the 13 selected articles, eight (Arbyn et al. 2014; Brandt et al. 2015; Carrasquillo et al., 2018; Chatzistamatiou et al., 2017; Madzima et al. 2017; Racey et al. et al. 2016; and Vanderpool et al., 2014) showed that home-based HPV self-sampling for cervical cancer screening is an acceptable intervention within underserved communities and has contributed to increased cervical cancer screening compliance. This strategy has also been noted to eliminate specific barriers such as privacy, lack of access to primary care providers, and certain religious/cultural beliefs that have hindered women living in rural communities from adhering to timely cervical cancer screening.

Five articles, including those by Ebu et al. (2019), Limmer et al. (2014) and Richard et al. (2020), evidenced that increased patient knowledge and awareness are crucial to improving cervical cancer screening compliance among women living in underserved communities. Despite multiple issues affecting patient adherence, interpersonal communication between healthcare professionals and patients has shown to be a significant factor in improving CCS compliance, especially within underserved communities (Chichirez & Purcarea, 2018; Lee & Duran, 2017).

Two of the articles showed evidence that adequate utilization of ASCCP guidelines improves early detection of cervical cancer screening (Demarco et al., 2020; Perkins et al., 2020).

The articles provided sufficient and consistent evidence to support a home HPV self-sampling strategy with increased patient education and adequate utilization of ASCCP guidelines in improving CCS compliance and early detection of cervical cancer.

### ***Strengths***

The studies' primary strengths lie in women's unique experiences using the home HPV self-screening and the related impact on the uptake of cervical cancer screening compliance. This exploration provided insight into the social, environmental, and personal dynamics related to timely cervical cancer screening among women living in underserved communities. Carrasquillo et al. (2018) performed a randomized control trial in which 160 of 207 (77%) of women in the self-swab option group completed cervical cancer screening versus 57 of 182 (31%) in the outreach group. Bharel et al. (2015), Brandt et al. (2019), and Chatzistamatiou et al. (2017) identified similar findings: more than 80% of women chose home self-sampling over clinician sampling. Lea et al. (2019) and Madzima et al. (2017) used multivariate logistic regression to assess the predictors of delay in CCS completion among women in the rural community, which primarily indicated a lack of patient knowledge and cost of travel to clinicians as predictors. With the use of home HPV self-sampling, it was noted that home-based HPV self-collection represents an opportunity to re-engage infrequently screened women into preventive screening services.

Bharel et al. (2015), Ebu et al. (2019), Limmer et al. (2014), Richard et al. (2020), and McDermott et al. (2020) offered a diverse array of interventions that demonstrated improvement

to increase cervical cancer screenings. These interventions included providers and patients' education. Furthermore, Madzima et al. (2017) performed a systematic review of studies that focused on HPV self-tests from a full search of relevant literature published in English between 1997 and 2015 using PubMed and EMBASE databases, revealing a substantial body of evidence that supported the usefulness of HPV self-sampling in increasing the participation of hard-to-reach women in screening programs.

## **Evidence Synthesis**

### ***The Barrier to Having Cervical Cancer Screening***

The reviewed studies indicated that a low access to healthcare, knowledge deficit, low educational attainment, negative attitude, and cultural beliefs were the main barriers behind decreased CCS in rural communities (Arbyn et al. 2014; Vanderpool et al. 2014)

### ***Benefits of Timely Cervical Cancer Screening***

Regular screening for cervical cancer with the Pap test in an appropriate population of women reduces mortality from cervical cancer (Arbyn et al., 2014).

### ***Education***

Acquisition of knowledge empowers women to ask pertinent questions relating to cervical cancer prevention. Extending education to a broader circle of influence supports individual cervical screening by removing misconceptions that hinder screening behaviors (Fong, 2013; Richard et al., 2020; Ebu et al. 2019 & Bharel et al., 2015).

### ***Enhanced Access to Screening***

Home HPV testing gives patients enhanced access to screening which includes limiting financial costs or transportation barriers (Corcoran & Crowley, 2014; Fong, 2013). Most of the

female patients at the project site community earn their income from hourly wages. Therefore, time off from work to visit healthcare providers for screening tests results in loss of income.

### ***Comparison of Clinician Completed Screening vs. Home HPV Self-Sampling***

The specificity of self-collected Pap smears was almost identical to that of clinician-collected samples (Singla & Komesaroff, 2018). This indicated that tissue samples collected by patients in the comfort of their own homes are similar to what is collected at the clinic by a clinician. Self-collection of Pap smears was noted to be an effective and acceptable alternative to clinician-collected samples and may provide a strategy for improving compliance with cervical cancer screening.

### ***Implementation of ASCCP Guidelines***

Adequate utilization of the 2019 ASCCP guidelines helps in the prompt detection of abnormal cervical cancer screening results with a corresponding referral for definitive diagnosis, thereby increasing the opportunity for the early diagnosis of cervical cancer. This implies that appropriate and timely follow-up of abnormal results is essential in the outcomes of cervical cancer treatment. (Demarco et al., 2020; Perkins et al., 2020).

### **Themes**

Increased uptake of CCS resulting from Home HPV self-sampling intervention within the underserved community.

Home self-sampling eliminates specific barriers such as privacy, PCP inaccessibility, and religious/cultural beliefs.

The specificity of self-collected Pap smears was almost identical to that of clinician-collected samples.

Focus on empowering the individual by acquiring knowledge is key to increasing CCS compliance.

Compliance with follow-up remains a severe issue that needs to be addressed.

Self-sampling screening can reduce social inequalities in access to screening in the underserved community.

Adherence to the 2019 ASCCP guidelines improves outcomes.

Appropriate and timely follow-up for abnormal results is essential to the outcomes of cervical cancer treatment.

### **Utility/Feasibility**

From the needs assessment completed at the project site, it was noted that some of the barriers to achieving timely CCS for most women living in the underserved community include a loss of income due to time off from work, inability to pay for daycare time to go to their primary care physician, discomfort in undressing before a provider, and the fear of going to the clinic now for fear of contracting Covid-19. Many of the patients interviewed indicated willingness and acceptability of home self-sampling for HPV due to its convenience, comfort, privacy, and ease of performance. With this information at hand, the project team agreed to mail home HPV self-sampling kits to qualifying women aged 21- 65 years who are yet to complete their CCS upon project plan approval.

## **Section III: Methodological Framework**

### **Restatement of Inquiry Question**

Among women aged 21-65 years presenting to a primary care clinic, how does a standardized CCS workflow process, and the addition of a home HPV testing option with

augmented patient education, impact CCS rates and referrals for definitive management per the 2019 ASCCP guidelines, compared to current Practice?

### **Project Design**

This is a quality improvement project aimed at implementing a standardized CCS and abnormal result management workflow by identifying and screening women aged 21-65 years who are not up to date with their CCS, providing the option for home HPV testing versus in-clinic screening, and managing abnormal Pap-smear results using 2019 ASCCP risk-based management guidelines. The project is designed to provide augmented patient education during the project period. Patients with cervical cancer were excluded from the project, and screening was done five days a week, with Thursdays set aside as Pap smear day.

### **Project Intervention Plan/System Change**

Implementing an evidence-based practice change in an organization entail engaging the stakeholders, securing administrative support, and preparing for the project's kick-off (Gallagher-Ford et al., 2011). For this project, the stakeholders comprised the patients and the project team, including all staff and providers working at the Clinic. The project's main objective is to increase compliance with CCS among women aged 21-65 years living in the community who routinely seek care at the Clinic. The critical interventions implemented were new to the current clinic practice protocol, including the addition of a home HPV self-sampling option with augmented patient education. The concept of cervical cancer screening guidelines was per the USPSTF 2012 standard guideline.

### ***Home HPV Self-screening Sampling***

This was conducted by mail, with sampling kits delivered to women aged 21-65 years who were not up to date with their cervical cancer screening. With this, patients collected their vaginal samples in the comfort of their homes following the kit's attached instructions and guide. Each individual then sent the sample collected to the laboratory with the returned slip to the for testing, and the test results were reported to the clinic for follow-up with patients.

### **Potential Benefits**

Self-sampling for cervical cancer screening might offer several advantages, especially for women with low socioeconomic status living in rural areas. Self-sampling might encourage screening participation in underscreened populations (AMA Journal of Ethics, 2020). It has been reported that the lack of privacy for women is one of the crucial reasons behind forgoing screening. Another benefit is that HPV testing (especially polymerase chain reaction-based assays) was accurate on the self-collected specimen and clinician-collected samples (Arbyn et al., 2018).

### **Potential Limitation**

Due to the high sensitivity of HPV testing, there was concern that it might lead to the over detection of cervical dysplasia and thus unnecessary interventions for both transient HPV infections and less severe cervical lesions that would otherwise resolve on their own, subjecting those affected to undue physical and mental burden (Hoste et al. 2013).

### ***Increased Patient Education***

This intervention was conducted by having culturally and linguistically appropriate posters on CCS information placed at the lobby where patients wait before being taken to exam rooms to prompt proper decision making; one-on-one patient teaching during patient encounters; having the waiting area TV programmed to CCS advertisements every 10 minutes and assigning every Thursday as a Papanicolaou test day.

### ***Implementation of 2019 ASCCP Guidelines***

The implementation of the 2019 ASCCP Guidelines was completed by updating organizational protocols to screen and manage abnormal results. There will be continuous training and in-service of staff on the organizational updated guidelines and screening protocols. The ASCCP algorithm charts were laminated and placed in women's health exam rooms and on clinician charting desks to remind the providers of the guidelines.

Based on the proposed intervention strategies, the evidence-based interventions specific to the project aimed to improve the system. The project practice site implemented the intervention strategies into the organization's standards of practice upon completion. The project team deliberated on the usefulness of home HPV self-sampling to women living in the rural community and agreed to the monthly mailing of home HPV self-sampling kits even after the project was completed. There will be continuing education sessions focused on the principles of interpersonal staff-patient relationships and application for enhancing communication skills to overcome the unique barriers experienced by women regarding cervical cancer screening.

### **IRB Approval Process**

Approval by the Institutional Review Board was not required for this project because it did not involve research on human subjects as a quality improvement project. However, an IRB approval letter was obtained from the TWU IRB board before implementing the project (See Appendix F).

### **Interprofessional Collaboration**

Several team members participated in this DNP project. The site project coordinator was the office manager responsible for ensuring adequate access to baseline data and providing sufficient requisition forms for home HPV self-sampling kits for the project. The office manager was the project coordinator who worked with other project team members during the process and monitoring of the project implementation outcome as it related to the organizational goal of improving scores on HEDIS as well as meeting the corporate goal of improving health outcomes for the patient population living within the community. Other team members include the DNP student who is the team lead with the role of analyzing data, providing patient education, and ensuring that scheduled screening exams are performed. The front desk staff was saddled with the responsibility of ensuring that cervical cancer screening questionnaires were completed correctly. The providers had the obligation to ensure that every woman aged 21-65 years who sought care at the clinic understood the importance of timely cervical cancer screening and the responsibility of communicating the screening results to the patients with an adequate referral for colposcopy. Medical assistants helped in setting up the cervical cancer screening rooms on time without having the patients wait for a long time for the screening at the Clinic.

## **Implementation/Improvement Model for the Project**

The model for improvement was designed to improve processes within a complex system or organization that is made up of several moving parts (Crowl et al., 2015). The model focuses on making minor changes to these processes, and rapid improvement can be achieved without significant organizational resources and time (Crowl et al., 2015).

The evidenced-based practice model of implementation used for the project was the IOWA Model. The Iowa Model can help healthcare providers translate research findings into clinical practice while improving outcomes for patients (Brown, 2014). We chose this model for the DNP project because it focuses on the importance of considering the entire organizational healthcare system from the provider to the patient to the infrastructure, using research within these contexts to guide practice and to improve quality of care within a system (Correa-de-Araujo, 2016).

### **IOWA Model Steps**

#### ***Step 1: Identify a problem***

A quality care gap was identified at this stage, which indicated that more than 60% of women living in the community have not been up to date with cervical cancer screening guidelines. A score of 23% on the Healthcare Effectiveness Data and Information (HEDIS) measures confirmed inadequate cervical cancer screening rates at the project site. With this gap in the quality of care, the need to increase cervical cancer screening compliance and improve the quality of health for women living in the community was identified.

#### ***Step 2: Determine whether the problem is a priority for the organization.***

The organizational goal is to improve the quality of care for patients living in the community. However, with low rates of CCS, women in the community are at higher risk of

having undiagnosed cervical cancer or being diagnosed late, negatively impacting their quality of life. Based on the organization's objectives, the need to increase compliance with cervical cancer screening becomes a priority for the organization and the community in general.

***Step 3: Form a team and implement the EBP change.***

With the care gap identified and determined to be a priority, the interprofessional project team was formed to include all clinical and nonclinical staff of the organization that would help in developing intervention plans and implementation strategies geared towards improving cervical cancer screening for women aged 21-65 years living in the community that routinely seek care at the project site.

***Step 4: Gather and critique relevant research related to the desired practice change.***

In this step, an inquiry question was formulated, and a literature search was conducted to ascertain evidence-based interventions that have increased cervical cancer screening for women living in an underserved community.

***Step 5: Critique the available studies to determine whether the survey with the tested intervention is scientifically sound.***

At this step, the available studies were analyzed for whether the tested interventions were scientifically sound, dependable, and generalizable.

***Step 6: Implement the intervention in a pilot practice change.***

Finally, the project team determined that mailing home HPV test kits to qualified patients and increasing patient education to increase their knowledge and awareness of the importance of timely CCS would be implemented.

### **Data Collection Plan**

Data were exported from the HEDIS measures report and the clinic's EMR on the number of patients who had not met the requirement of CCS per the U.S Preventive Service Task Force (USPTF) guidelines. The data gathered identified the number of women who qualified for screening over the duration of the project. All data and information collected for the project were identified pre- and postproposed intervention implementation to measure the outcome effectively.

### **Data Analysis Plan**

The evaluation tool assessed the number of cervical cancer screenings scheduled and completed either in-clinic or via a home self-sampling kit during the period of intervention implementation. Charts were evaluated to determine the percentages before implementing the intervention tool for practice cervical cancer screening. The preimplementation data was compared to the post-implementation data to determine the outcome.

The cervical cancer incidence rate was calculated using the following formula:

$$\text{Baseline Cervical Cancer Incidence Rate (\%)} = 100m/(q-r)$$

$$\text{Pre- and Postintervention Implementation Cervical cancer incidence Rate (\%)} = 100m(q-s)$$

Numerator: Number of women aged 23-64 years who received a pap smear during the measurement period(m).

Denominator: Number of women aged 23-64 with a medical visit during the measurement period(q)

Denominator exclusion:

- a. Women who received Pap smears during 2019 & 2020(r)
- b. Women who received Pap smears in 2019, 2020, and 2021 before the measurement periods(s).

The cervical cancer screening incidence rates was calculated rather than the cervical cancer screening rates to accurately represent the proportion of eligible women appropriately screened during the specific measurement period. The baseline data consisted of a HEDIS Measures score and EMR generated data on women aged 21-65 years who were up to date on their cervical cancer screening.

### **Data Evaluation Plan**

For the data evaluation plan of the project, we compared HEDIS scores pre-and postproject for percentages of cervical cancer screenings completed during the annual physical examination. There was a chart review to ascertain the number of women who completed cervical cancer screening within the stipulated project timeline compared to the last year before project implementation.

### **The Proposed Budget**

The success of a project can depend on the resources needed and available to implement changes. The proposed budget lists the vital components for completing the project and only estimates the funds needed over the three months of the project after approval and implementation. The proposed budget for the project was not extensive because the needed resources were already in the clinic and conducted by staff during regular clinic hours, and resources and supplies were already incorporated into clinic office supplies. The training of the project team, mailing of HPV kits, and patient education were also completed within the office

workhour timeframe. Including these costs in the project, the budget provides a framework for the study.

In terms of anticipated revenue, the average number of daily cervical cancer screenings is about six, for which the clinic is reimbursed \$115 per procedure. The facility is open Monday through Friday, so if the average weekly Pap screenings is 30, that would yield \$3450 in weekly revenue to the clinic.

There was no direct cost associated with the mailing of the home HPV testing kits because the project team completed the requisition form and faxed it to the laboratory representative, who then mailed the kits to the patient and the cost of mailing was included in the screening billed to Medicaid.

### **Project Timeline/Gantt Chart**

The project timeline provided an overview of the entire project task and dates from the start to the finish. Table 1 below shows tabulated tasks with their various durations for the project. See appendix G for a Gantt chart illustration of the project timeline.

**Table 1**

*Task/project timeline*

<b>Task</b>	<b>Start Date</b>	<b>End Date</b>	<b>Duration</b>
Information gathering on project topic	9/1/2021	9/15/2021	14
Meeting with medical director/stakeholders on the problem identified	9/16/2021	9/30/2021	14
Project plan/strategy development	10/1/2021	10/20/2021	19

Team collaboration/role assignment	10/21/2021	11/14/2021	24
Drafting of project proposal	11/15/2021	2/5/2022	82
Project proposal presentation	2/6/2022	2/9/2022	3
Data collection & implementation	2/10/2022	3/18/2022	36
Outcome measures	3/19/2022	3/25/2022	6
Final project presentation	3/27/2022	3/31/2022	4

### **Metrics Grid: Outcome Measurement**

For the metric grid, three measures were examined for evaluating QI initiatives: outcome measures, process measures, and balancing efforts (IHI, 2019).

#### **Outcome Measures**

An increase in the number of women aged 21-65 years who completed HPV self-sampling by the end of the project.

An increase in the number of women who scheduled and completed their cervical cancer screening following increased patient education by the end of the project.

An increase in the organizational quality metric score per the HEDIS measure for Medicaid female patients aged 21-65 years by the end of the project.

The sustainability of the project intervention strategies after completing the DNP project.

An increase in referral on abnormal results in cervical cancer screening using the ASCCP guidelines.

### ***Process Measures***

The number of scheduled and completed Pap smears performed weekly for women aged 21-65.

The number of HPV home self-sampling kits correctly completed and returned

Percentage of Medicaid insured women aged 21-65 years who completed their Pap smears by the end of the project.

Home HPV Sampling kits: tracking the number of sample mailings sent.

The number of abnormal results referred out for colposcopy or treatment by the end of the project.

### ***Balancing Measures***

Due to the limited number of female providers available to complete Pap smears and the strategies of increased patient education on cervical cancer screening information, there was an increase in wait time for patients seeking care at the clinic, thereby decreasing patient satisfaction. This barrier was addressed by having Thursdays only as Pap smear days.

## **Section IV: Findings and Results**

### **Characteristics of the Sample**

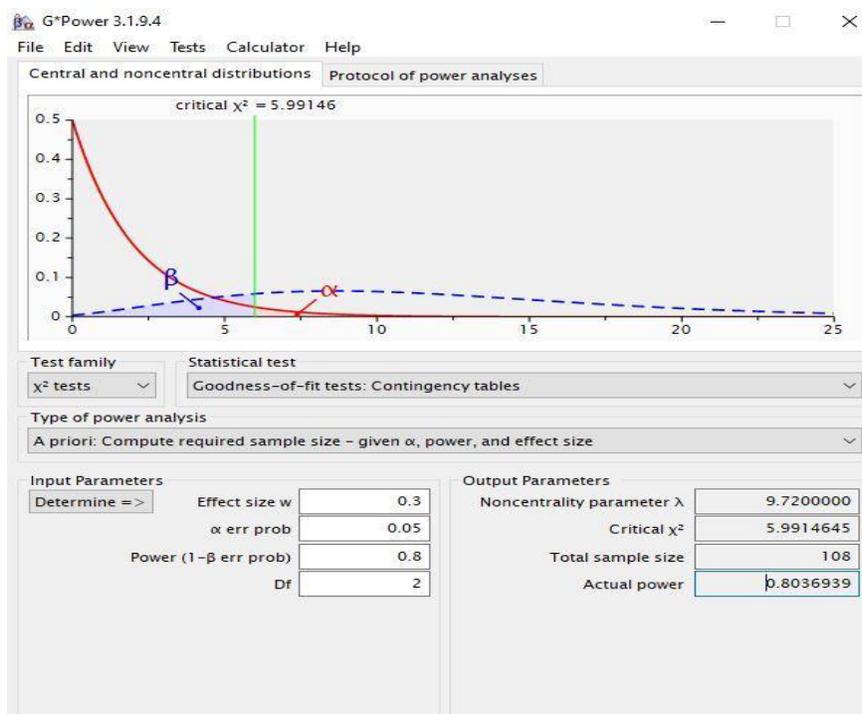
Data collection occurred for patients who routinely seek care at the facility and presented themselves for care within the project implementation timeframe, from January through March 2022. There were 130 patients included in the project. The criteria for inclusion entails that the participant must be female aged 21-65 and must not have completed cervical cancer screening within the last three years. The sample data were extracted from a retrospective chart review and

monthly report on HEDIS score measures. Women aged 21-65 years with a history of cervical cancer were excluded from being part of the project sample population. The initial data were collected using an Excel spreadsheet and was organized, analyzed, and assessed. With guidance from a TWU statistician, the data were evaluated multiple times to eliminate errors and maintain consistency and reliability (For the sample datasheet, see Appendix H).

## Power Analysis for Targeted Sample

### Figure 1

#### *Power Analysis of Sample*



The G-power software program executed a power analysis to determine the ideal sample size (Heinrich-Heine-Universität Düsseldorf, 2020). The intent was to estimate the target sample size for 80% power, p of .05, and medium effect size of .50. The recommended sample size was

49 in each group and 98 minimum for the total sample size based on the assumptions. Figure 1 above illustrates the results for a two-tailed, independent statistical t-test.

## Demographic Variable Characteristics

Table 2

### *Patient's Basic Demographic Characteristics*

<b>Demographics</b>					
<b>Pre-Intervention Group(n=51)</b>			<b>Post-Intervention Group(n=79)</b>		
	<b>M(SD)</b>	<b>Percent</b>		<b>M(SD)</b>	<b>Percent</b>
Age	43.8(11.1)		Age	44.5(11.2)	
Race			Race		93.5%
Black		98.7%	Black		0%
White		0%	White		6.5%
Others		1.3%	Others		
Insurance			Insurance		
Private Ins		2.6%	Private Ins		3.9%
Medicaid		97.4%	Medicaid		96.1%
Uninsured		0%	Uninsured		0%

Table 2 shows the demographics of the project population. For the preintervention group, the median age was 43.8, and 98.7% of the participants were Black or African American, with 1.3% from other races. No white patient participated in the preintervention phase of the project. In terms of insurance coverage, 97.4% of the patients who participated were covered by Medicaid, while 2.6% were covered by private insurance.

For the postintervention group, the median age was 44.5, with 93.5% of the sample population being Black or African American and 6.5% from other races. No white race

participated in the postintervention phase of the project study. In terms of Insurance coverage, 96.1% of the women who participated were covered by Medicaid, while 3.9% were covered by private insurance.

**Outcomes**

**Figure 2**

*Run Chart on Weekly CCS Rate Completed in Clinic/ Number of Home Tests Received*

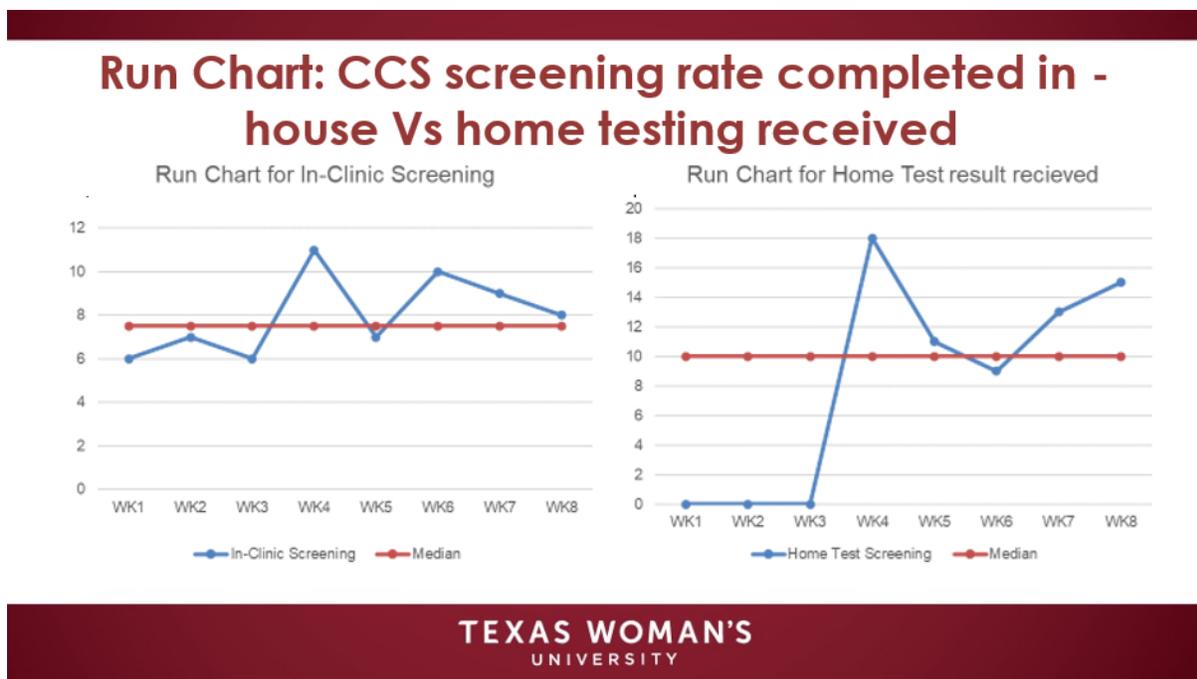
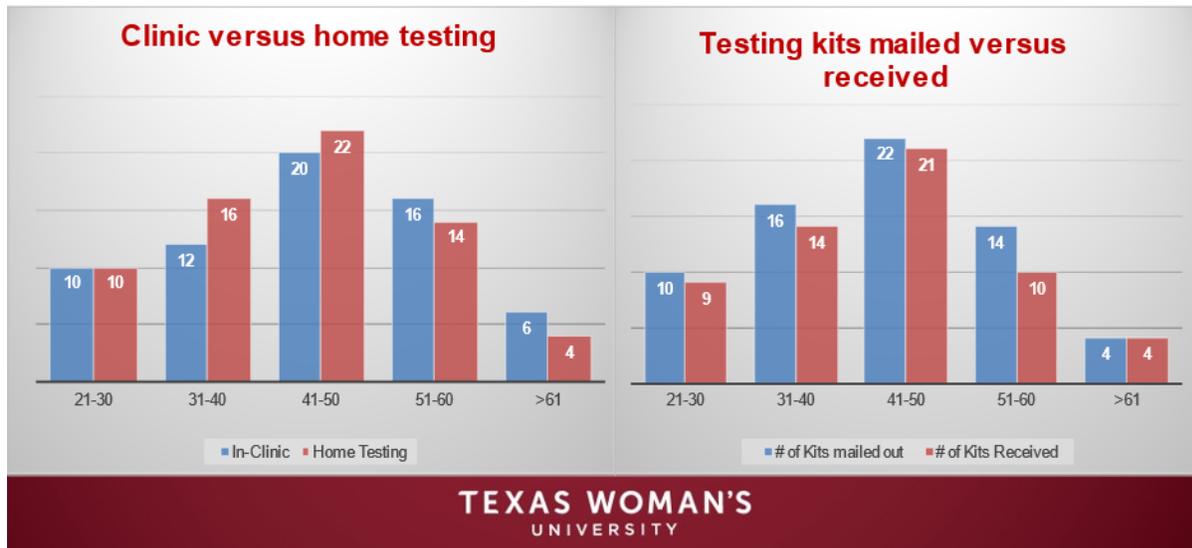


Figure 2 above shows run charts for the weekly number of CCSs completed in clinic, and the number of home test results received. The run chart showed a median rate of 7.5 for in-clinic screening and a median rate of 10 for the home self-test received. This indicated an improvement in screening rates with the addition of a home HPV testing option.

**Figure 3**

*Home Tests Mailed vs. Received and In-clinic vs. Home Test Option*

## Result: Analysis of the Interventions



In terms of age demographic variable analysis, women aged 41-50 years had the highest screening compliance rate for both in-clinic and home completion compared with other age groups during the project timeframe. It was also noted that women more than 61 years of age had the lowest screening rates for both clinic and home testing.

*Chi-Square Analysis of Pre- and Postintervention CCS Rates & Home Test Kit Return Rates*

Figure 4

*Analysis of Screening Rate Pre-/Postintervention*

**Pre=1; Post Intervention=2**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	51	38.6	39.2	39.2
	2	79	59.8	60.8	100.0
	Total	130	98.5	100.0	
Missing	System	2	1.5		
Total		132	100.0		

Based on the results of the frequency analysis displayed in Figure 2 above comparing pre-/postintervention outcomes, there was a 21.2% increase in CCS rate postintervention, compared to the preintervention phase of the project. This implies that the addition of a home HPV testing option contributed to the increase in cervical cancer screening rates among women aged 21-65 who routinely sought care at the primary care facility.

### **Pearson Chi-square Analysis of Pre-/Postintervention CCS Rates vs Home Tests Kits Return Rates**

Figure 5

#### *Pearson Chi-Square Analysis*

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	59.676 <sup>a</sup>	2	<.001
Likelihood Ratio	77.860	2	<.001
Linear-by-Linear Association	3.657	1	.056
N of Valid Cases	130		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.28.

Figure 5 is a Pearson chi-square analysis that shows the association between two independent samples- CCS rates pre-and postimplementation. In this QI project, the Pearson chi-square test result demonstrated the effectiveness of the intervention in increasing the rate of CCS among women living in the practice community. A cross-tabulation using a Pearson chi-square analysis showed 59.6 and p-value of <.001, which is statistically significant. This implies that the addition of a home self-testing option led to an increased cervical cancer screening rate during the project period.

Figure 6

***Cervical Cancer Screening Rate in Clinic and the Home HPV Testing Completed***

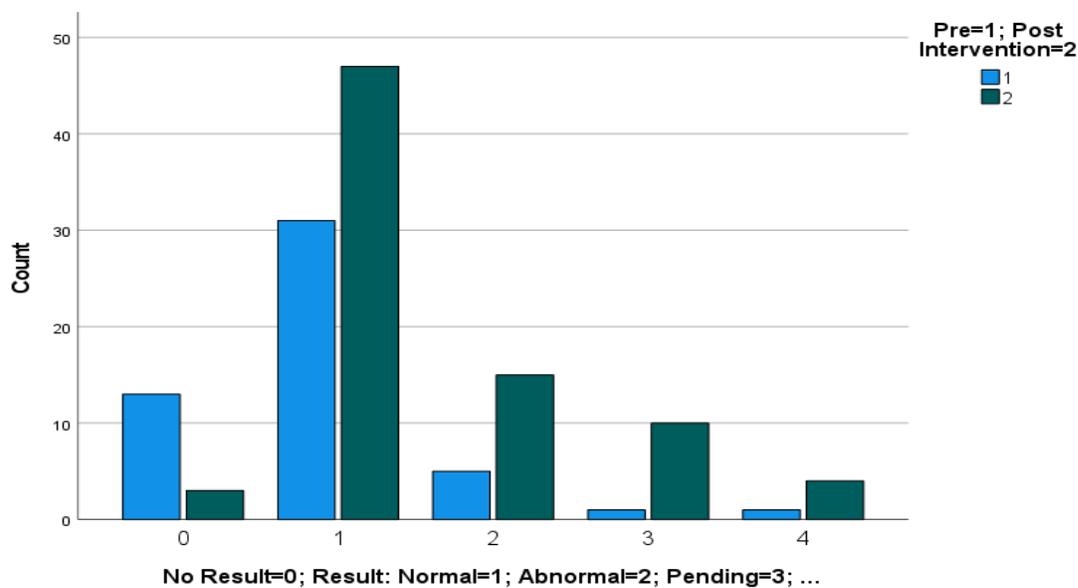
**Crosstab**

Count	Pre=1; Post Intervention=2		Total	
	1	2		
Screening Performed: In-clinic=1; Home Text option=2; No Show=3	1	38	23	61
	2	0	53	53
	3	13	3	16
<b>Total</b>		<b>51</b>	<b>79</b>	<b>130</b>

As shown in Figure 6, 56 home testing kits were mailed during the implementation phase of the project. Of these, 53 were completed, returned, and assessed, and three were pending at the end of the project timeframe.

Out of the 74 in-clinic cervical cancer screens scheduled during the project timeframe, 61 were completed, while 13 of the selected sample population were no-shows or declined the screening. The 13 no-shows for scheduled appointments occurred during the preintervention phase of the project.

Figure 7

***Abnormal Screening Result Analysis for Pre-/Postintervention***

***Y-axis=Number of screenings; X-axis: No result= 0, Normal result= 1, Abnormal result= 2, Pending result= 3, Incomplete= 4***

Due to the increased number of screenings at the postintervention phase, more abnormal results were identified and referred out accordingly for definitive diagnosis.

**Discussion and Conclusion**

The project's primary aim was to increase the rate of cervical cancer screening and standardize the workflow process utilizing the 2019 ASCCP guidelines in a rural primary care setting. The project was able to implement new interventions to increase the screening rate

among the patient population. The organization's stakeholders adopted and supported the DNP project due to its alignment with the organizational goal of improving the quality of health for its patient population.

During the implementation phase of this project, a home testing option with augmented patient teaching and application of ASCCP recommended treatment guidelines were effectively utilized. The outcome evaluation showed a significant increase in the rate of compliance with cervical cancer screening compared with the usual organizational practice.

In terms of adherence to the ASCCP guidelines, the use of the workflow algorithm contributed to an improved and prompt referral of abnormal results for colposcopy or treatment based on patient's risk, thereby increasing the opportunity for early diagnosis of cervical cancer. Exposure to teaching the 2019 ASCCP guidelines before introducing the algorithm influenced the improved outcome post algorithm due to a greater understanding of the guidelines. This enhanced the rate of timely follow-up and referral of abnormal results, which allowed early diagnosis and treatment. The data collected was evaluated based on preintervention and postintervention screening rates. The data analysis supported the critical goal of assessing the change in practice and using the result to improve the care process. There was a statistically significant increase in the rate of cervical cancer screening postintervention implementation compared to preintervention with a Pearson chi-square value of 58.9( $p < .001$ ).

Overall, this quality improvement project supported the hypothesis that home HPV testing improves the CCS rate in women living in rural communities and that adequate utilization of ASCCP guidelines can lead to timely referrals for definitive management of abnormal results, which will allow for early detection and treatment. An evaluation of the implementation phase

showed an increase in cancer screening rates after the implementation project intervention, and more patients were referred out for the management of abnormal results. The project site had a 46% (per HEDIS measures report) increase in the number of cervical cancer screenings completed in this clinic while using the home testing option with increased patient teaching intervention tools. Though this percentage was only over three months at the clinic, it was still arguably an impressive number.

To help continue and sustain improvement, a process of care flowchart was created as a standard and protocol of CCS, approved and adopted by the medical director of the facility. This new care process will serve as a guide and benchmark to improving preventive care at the facility and not just cervical cancer alone.

### **Limitations/Barriers**

The most impactful limitation was the ongoing COVID-19 pandemic, which has created great hesitancy in people about visiting the facility for their scheduled screening test due to the fear of contracting the infectious disease (Alkatout, et al., 2021). Another barrier encountered was the short timeframe for the data collection and intervention implementation phase. The implementation phase was intended to be at least 12 weeks, but it was concluded within 7 weeks due to the limited project timeframe. There was also noted resistance from employees for change because this was the first quality improvement project at the facility. Within the project period, two of the project team members went on a family leave of absence which increased the workload and task of every team member.

However, in all these limitations, the team members were able to pull resources, efforts, and knowledge together to make the completion of the project a success and seeing the positive

outcome in patients' rate of compliance and improvement of the organizational quality measures gave the team members the reason to take credit for their hard work.

## **Section V: Recommendations and Implication for Practice**

### **Recommendations**

Updated EHR software to support automated phone call reminders to the patient on their upcoming preventive screening will help in reducing the number of no-shows for all preventive screenings at the facility. The continued home testing option with increased patients' education at every patient encounter was noted to increase patient's knowledge about CCS. Consistent and effective utilization of ASCCP guidelines by providers will serve as a roadmap for managing abnormal cervical cancer screening results at the facility. Continuous utilization of the cervical cancer screening workflow care process will serve as a guide for every member of the healthcare team at the facility.

### **Implications for Practice**

Improving the quality of health and health outcomes is the focus of every primary care setting. One of the best ways to achieve this is to raise awareness about health issues important to the population being cared for and to educate the community about the importance of preventive care. With adequate and timely preventative care, cervical cancer can be prevented or diagnosed early, thereby improving patient outcomes (CDC, 2016). To meet the Healthy People 2030 goal for CCS of 84.3%, healthcare facilities should evaluate their current rates and incorporate evidence-based interventions in a manner that is adaptable to the healthcare environment's workflow. Adequate training and post training assessment for team members are needed to ensure that everyone understands their roles and responsibility for quality improvement sustainability.

## **Alignment with DNP Essentials**

The DNP Essentials are competencies that provide a foundation for all advanced nursing practice roles (AACN, 2021). It emphasizes the need for DNP students to complete a scholarly project to improve the quality of clinical practice. The DNP Essentials are skills and competencies related to healthcare administration, the clinical aspect of patient care, and the interprofessional collaboration that defines advanced practice nursing. DNP Essentials include 10 domains:

### ***Domain I: Knowledge for Nursing Practice***

The DNP student demonstrated alignment with the DNP Essentials by integrating and applying advanced nursing knowledge into practice and demonstrating the application of nursing science in improving the quality of care for the patient population. This distinguishes the practice of professional nursing and forms the basis for clinical judgement and innovation in nursing practice (AACN, 2021).

### ***Domain II: Patient-Centered Care***

The DNP student demonstrated Domain II by providing care that was culturally sensitive and minimized religious and socioeconomic barriers at the project site. The student also used advanced communication skills to reach out to patients with diverse backgrounds in a coordinated and compassionate manner for health promotion and disease prevention (AACN, 2021).

### ***Domain III: Population Health***

By completing this project, the DNP scholar demonstrated the domain by promoting population health, emphasizing disease prevention, and introducing evidence-based interventions

that have led to increased compliance to CCS among women living in the community (AACN, 2021). With timely diagnosis of cervical cancer, the mortality rate associated with the diagnosis is reduced leading to an improved health outcomes and wellness among the population.

***Domain V: Quality and Safety***

The DNP scholar demonstrated Domain V by improving the quality of care received by the patient population and minimizing the risk of harm for patients and the team members through both system effectiveness and individual performance (AACN, 2021). This was done by developing a workflow change that would ensure that CCSs would not be overlooked, and the evidence-based treatment guidelines would be applied following screening.

***Domain VI: Interprofessional Partnerships***

This domain describes how leaders of interprofessional teams analyze practice and organizational issues and solve problems collaboratively (AACN, 2021). The DNP scholar demonstrated Domain VI by partnering with the interprofessional team at the project setting. Completing the DNP project successfully by embracing the diverse knowledge and input from team members, as well as facilitating improved interprofessional communications that helped optimize care, enhances the healthcare experience, and strengthens outcomes (AACN, 2021).

***Domain VIII: Informatics and Healthcare Technologies***

The DNP scholar demonstrated Domain VIII by using information and communication technology processes to provide care, gather data for the quality improvement project, form information that assisted in deciding on the DNP project, and support team members as they expand knowledge and wisdom for practice (AACN, 2021). Information process was used to

manage and improve the delivery of safe and efficient healthcare services in accordance with best practice and professional regulatory standards at the project site.

### ***Domain X: Personal, Professional, and Leadership Development***

This DNP scholar demonstrated Domain X by engaging in professional and leadership development activities such as attending the insurance stakeholders meeting and monthly quality improvement meeting at the project site. The DNP scholars' participation in activities and self-reflections that foster personal health, resilience, and well-being, which contributed to lifelong learning, demonstrates Domain X of the DNP Essentials.

### **Ethical Considerations**

Before beginning the research, the Institutional Review Board approval was obtained from the TWU IRB board. IRB approval protects the study participants. The most significant ethical consideration with this project was protecting the patients' anonymity. Study participation was voluntary, and there were no repercussions for opting not to have their cervical cancer screening done within the project timeframe. All communications regarding the study and informing participants of the project's purpose and nature were documented with the patient's initial to maintain the Health Insurance Portability and Accountability Act (HIPPA) privacy. The information provided in the study was presented in aggregate form and contained no identifying information for the provider. All data collected from chart audits were free of identifying data for both patients and providers, and no patient data were stored externally outside of the EHR.

### **Self-Reflection**

The DNP academic preparation generally, provided the opportunity to realize that the nursing career is not all about managing patients' disease processes but rather that the profession

necessitates understanding the community in which the healthcare services are being provided. Advocating for the well-being of the practice community and involving in leadership activities helped to improve the quality of care provided to the community.

The DNP scholarly project's initiation, planning, and implementation were critical to the role as a Nurse Leader. The didactic course and required practicum hours have helped in preparing the DNP project leader for the challenges of incorporating evidence-based practice in today's complex and dynamic healthcare setting. The journey through this program has accorded the DNP project leader with additional knowledge and skills to advance in the nursing career and provide advanced and high-quality care to the patients.

### **Next Steps**

The next step will be standardizing the cervical cancer screening process and consistently applying the ASCCP guidelines to the clinics' protocol and care process by educating the staff on the need for quality improvement sustainability and the organizational goal of improving the quality of health patients' populations. The DNP students have recommended converting the project team to a quality improvement team responsible for ensuring that the organization quality measures are improved by (a) providing monthly in-service to staff and providers on the HEDIS expected score across all preventive cares and (b) developing evidence-based interventions capable of increasing the rate of preventive screenings to include breast cancer, colon cancer, and prostate cancer screenings.

### **Project Dissemination**

Disseminating quality improvement outcomes in healthcare is vital to sustaining improvement and sharing outcomes with more channels of experts. This can lead to increased

patient outcomes and satisfaction. This project was the first of its kind at this local facility and, therefore, will be presenting the project outcome to the site employees and the medical director.

The DNP student did present the project process and outcome to TWU faculty and peers.

Following the project completion, the goal is to submit the manuscript and project result to the *American Journal of Nursing* for review and publication so that healthcare providers with similar practices and challenges, especially those in rural communities, can gain insight on ways to improve health outcomes for their patients.

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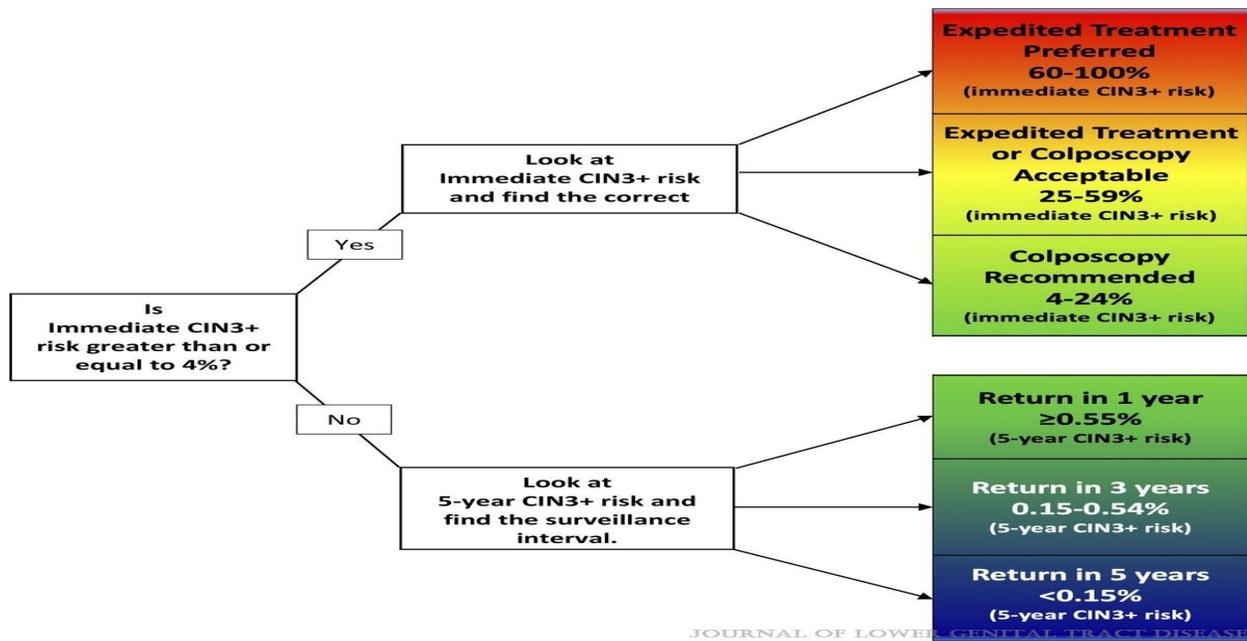
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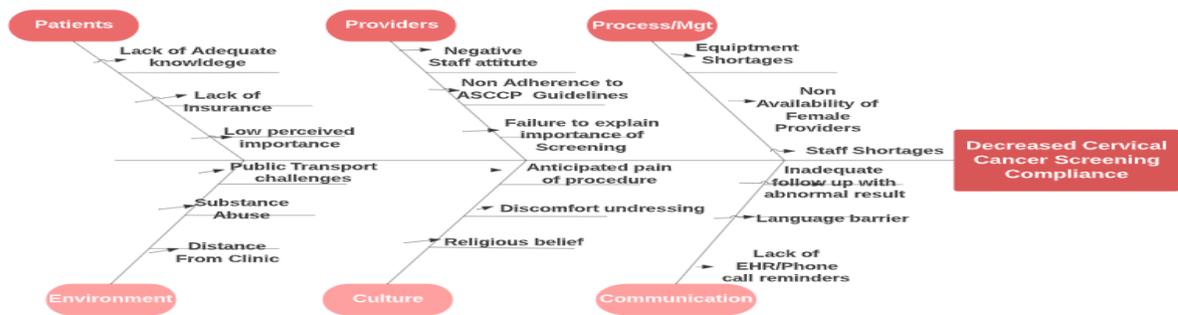
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### Appendix A: 2019 ASCCP Guideline/Algorithm



### Appendix B: Need Assessment: FishBone Diagram



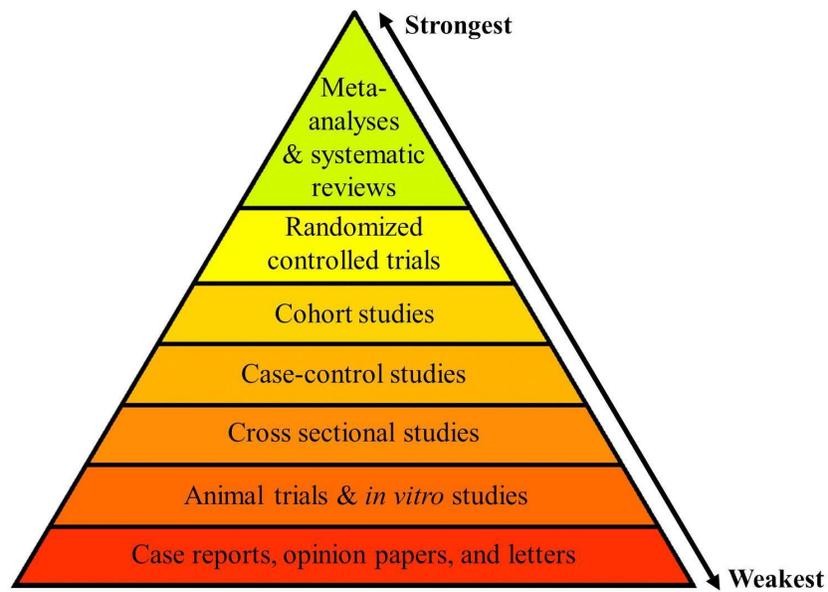
### Appendix C: SWOT Analysis

<p><b>STRENGTHS</b></p> <ul style="list-style-type: none"> <li>▪ Insurance coverage</li> <li>▪ Appropriate screening supplies</li> <li>▪ Female provider availability</li> </ul>	<p><b>WEAKNESSES</b></p> <ul style="list-style-type: none"> <li>▪ Lack of funding</li> <li>▪ Poor education and sensitization</li> <li>▪ Equipment shortages</li> <li>▪ Staff shortages</li> <li>▪ Male providers' reluctance</li> </ul>
<p><b>OPPORTUNITIES</b></p> <ul style="list-style-type: none"> <li>▪ Improve quality measures</li> <li>▪ Increase patients' knowledge</li> <li>▪ Early detection and treatment</li> </ul>	<p><b>THREATS</b></p> <ul style="list-style-type: none"> <li>▪ Cultural and religious belief</li> <li>▪ Outbreak of COVID-19 pandemic</li> <li>▪ Low socioeconomic status</li> <li>▪ No government funding</li> </ul>

<ul style="list-style-type: none"><li>▪ Implementation of 2019 American Society for Colposcopy and Cervical Pathology (ASCCP) guidelines</li></ul>	
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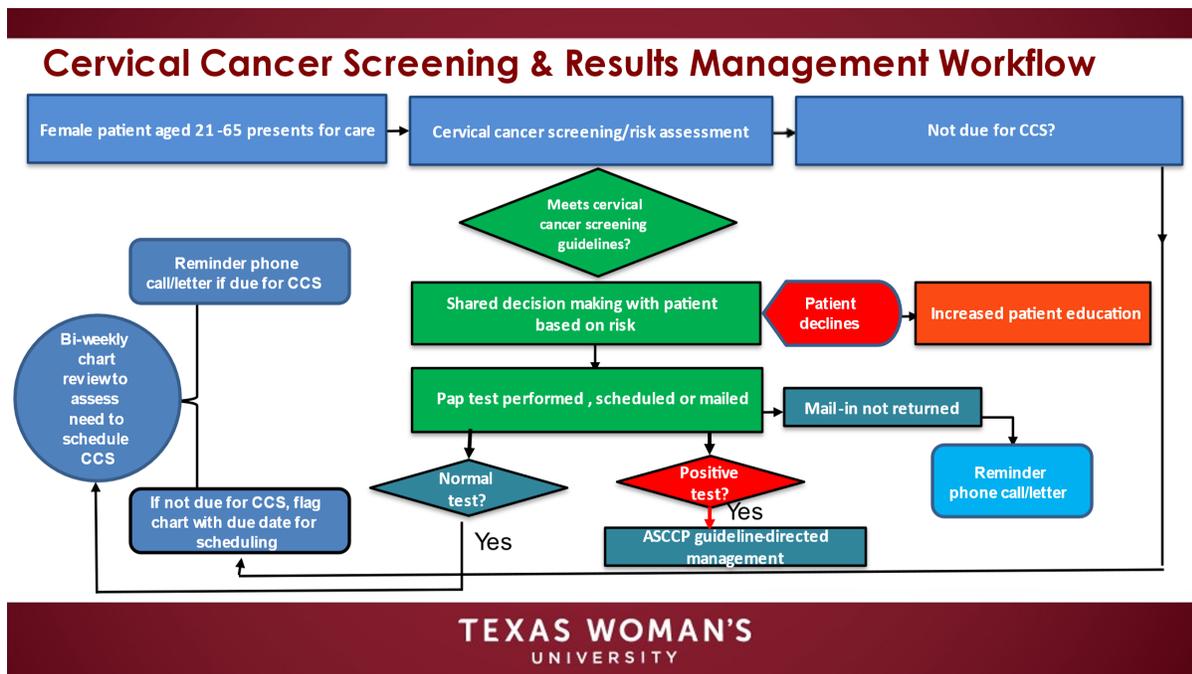
## Appendix D: Hierarchy of Scientific Level of Evidence

### Hierarchy of Scientific Evidence



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Appendix E: DNP Student Created Cervical Cancer Workflow Process



## **Appendix F: Letter From IRB**

December 16, 2021

Ugochi Ugwuegbulam  
Nursing - Houston

Re: IRB Not Required for IRB-FY2022-172 Improving Cervical Cancer Screening Rate in a Private Health Center: A Quality Improvement Project.

Dear Ugochi Ugwuegbulam,

The above referenced project has been received by the TWU IRB - Houston and it has been determined that this project does not require IRB review.

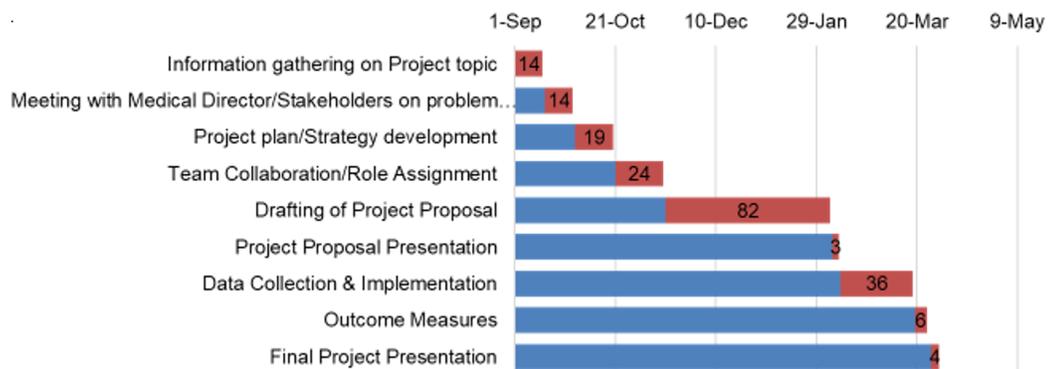
Based on the information provided regarding the description of the project and on the DNP Project IRB Acknowledgement form, the IRB has determined that this study is Quality Improvement and that there is no intent to contribute to generalizable knowledge. Therefore, this study does not require IRB review or approval.

If you have any questions or need additional information, please contact the IRB at [irb@twu.edu](mailto:irb@twu.edu) or refer to the [IRB website](#).

Sincerely,

### Appendix G: Project Timeline/Gantt Chart

## Project Timeline/Gantt Chart



### Appendix H: Sample Data Collection Sheet

## Sample Data Collection Sheet

Participant ID Number	Age (In years)	Race: W=1, AA=2; O=3	Screening Performed: In-Clinic=1; Home Text option=2 No Show=3	Pre-Intervention= 1 Post Intervention=2	No Result=0 Result: Normal=1 Abnormal=2 Pending=3 Incomplete=4

### Appendix I: Evidence Table

Article (APA Citation)	Type of Study/Level of Evidence	Objective	Evidence/Findings	Conclusion/Recommendation
Arbyn et al. (2014)	Meta-Analysis (Level I Evidence)	To assess whether HPV testing on self-collected samples is equivalent to HPV testing on samples collected by clinicians.	Some PCR-based HPV tests showed similar sensitivity on self-samples and clinician-based samples.	However, HPV testing on a self-sample can be an additional strategy for women not participating in the regular screening program.
Bharel et al. (2015)	Randomized Control Trial (Level I Evidence)	To evaluate the effectiveness of increased patient education in improving cervical cancer screening compliance among	This resulted in a significant increase in cervical cancer screening, from 19% in 2008 to 50% in 2013. Compared with national and local cervical cancer	Innovative and straightforward interventions such as patient education proved to be the most effective and practical methods of improving screening.

		the medically underserved population in Boston, United States.	screening trends, BHCHP surpassed improvement rates seen in other vulnerable populations.	
Brandt et al. (2019)	Qualitative Study (Level III Evidence)	To explore perceptions and acceptability of HPV self-sampling-based cervical cancer screening among community members and health professionals in rural northwest Ethiopia and to identify preferences and sociocultural barriers regarding self-sampling to design a suitable high-coverage screening	The self-sampling device was considered acceptable and was supposed to be easy to use for most women.	Home-based self-sampling for cervical cancer screening is a socially acceptable and feasible "task-shifting" method that will increase cervical cancer screening access and coverage in the Ethiopian study community.

		intervention for a rural African setting.		
Carrasquillo et al. (2018)	Randomized Control Trial (Level I Evidence)	To compare a community health worker (CHW)-led HPV self-sampling intervention with standard cervical cancer screening approaches.	Compared to more traditional approaches, HPV self-sampling led to increased cervical cancer screening among ethnic minority women in South Florida.	Self-sampling for high-risk human papillomavirus (HPV) is a promising approach to increase cervical cancer screening among hard-to-reach populations.
Chatzistamatiou, et al., (2017)	Pilot Study (Level III Evidence)	To assess the feasibility and acceptability of HPV self-sampling among women living in an underserved area.	Most women reported non-difficulty and non-discomfort in self-sampling (77.6% and 82.4%, respectively). They would choose self-sampling over clinician-sampling (86.2%), and should self-sampling be available, they would test themselves more regularly (92.3%)	self-sampling is feasible and well-accepted for HPV-based screening and could increase population coverage in underserved areas, helping to prevent cervical cancer successfully.

Ebu et al. (2019)	Randomized Control Trial (Level I Evidence)	To determine the effect of a health education intervention on cervical cancer and screening perceptions of women in the Komenda, Edina, Eguafo, and Abirem (KEEA) District in the Central Region of Ghana.	A comparison of the mean differences between the pre-post-test scores for the intervention and control groups showed a statistically significant difference for knowledge of cervical cancer.	Health education interventions are critical in improving knowledge and perceptions and increasing women's self-efficacy about cervical cancer and screening.
Lea et al. (2019)	Randomized Control Trial (Level I Evidence)	To ascertain the influence of knowledge and attitudes regarding cervical cancer and Pap testing as barriers to timely cervical cancer screening.	Improving awareness and knowledge through education increased cervical cancer screening in underserved women.  Home-based HPV self-collection represents an opportunity to re-engage infrequently screened women into	Increased patient knowledge and awareness are crucial to improving cervical cancer adherence among women in underserved communities.

			preventive screening services.	
Limmer et al. (2014)	A Systematic Review (Level 1 Evidence)	To identify factors that predict the use of cervical cancer screening in U.S women.	Patient education is a significant variable associated with cervical cancer screening adherence.	Providers can target specific at-risk populations to increase screening by educating women about the need for cervical cancer screening and early detection of the disease.
Madzima et al. (2017)	Focused Literature Review (level I evidence)	To provide a detailed review of the literature on the acceptability, feasibility, and uptake of human papillomavirus (HPV) self-sampling among hard-to-reach women.	Convenience, privacy, ease of use, and, likely, the cost-effectiveness of HPV self-sampling are driving forces in its emerging role in cervical cancer screening among hard-to-reach women (Madzima et al., 2017). Mailing of self-sampling kits has been shown to increase participation among hard-to-reach women.	There is a good body of evidence to support the usefulness of HPV self-sampling in increasing the participation of hard-to-reach women in screening programs.

Racey et al. (2016)	Randomized Control Trial (Level I Evidence)	To determine if cervical cancer screening uptake would increase among under-screened women living in rural Ontario, Canada, if at-home self-collected sampling for human papillomavirus (HPV) testing was offered as a primary cervical cancer screening modality, compared to invited Papanicolaou (Pap) testing or routine opportunistic screening.	Women receiving the self-collected HPV kit were 3.7 (95% confidence interval (2.2-6.4) times more likely to undergo screening than the standard of care screening.	Providing self-collected sampling for HPV testing was more effective than sending reminder letters to increase screening coverage in under-screened women.
Richards et al. (2020)	Randomized Control Trial (Level I Evidence)	To implement and evaluate a culturally relevant curriculum	There was a significant increase in Cervical Cancer knowledge	The study concluded that an evidence-based and culturally tailored educational

		to educate Grenadian Lay Health advisors on cervical cancer screening.	among Lay Health Advisors post-training ( $p < 0.05$ ), and Lay Health Advisors had favorable opinions about the intervention.	intervention could significantly improve cervical cancer and HPV knowledge among healthcare workers and patients.
Vanderpool et al. (2014)	Exploratory Study (Level II Evidence)	To determine whether Appalachian Kentucky women would be amenable to self-collecting a cervicovaginal specimen for HPV testing.	Among this sample of Appalachian Kentucky women, self-collecting a cervicovaginal specimen for HPV testing was highly acceptable.	Tailoring alternative cancer screening strategies to meet the complex needs of rural women is likely to lead to reductions in cervical cancer incidence and mortality among this vulnerable population.

