

Increasing Cervical Cancer Screening in a Rural Population through a Multifaceted Educational
Intervention

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Abstract

Background of Review of Literature: Over 14,000 new cases of cervical cancer were diagnosed last year in the United States (National Institutes of Health [NIH], 2021) with over half of those who were newly diagnosed having failed to be screened for cervical cancer in the past five years (Centers for Disease Control and Prevention [CDC], 2020). While there has been a decrease in cervical cancer deaths throughout the United States, women who live in rural communities face screening disparities and disparities in outcomes for cervical cancer. Providing education to healthcare providers regarding recent guidelines surrounding cervical cancer screenings (CCS) with the proper time frame for performing testing and providing reminders for patients has been shown to improve CCS rates in vulnerable populations.

Purpose: The purpose of this quality improvement (QI) project was to design and implement a multicomponent evidence-based educational intervention for the patients and providers in a rural health clinic in Mid-Michigan with the goal of increasing the proportion of CCS performed and increasing the amount of CCS appointments being made in women ages 21-64.

Methods: The QI project was implemented at a rural health clinic in Mid-Michigan. An educational presentation was given to healthcare providers and nursing support staff regarding current CCS guidelines. Both a pretest and posttest were administered to healthcare providers and nursing support staff to gauge knowledge before and after the 30 minute in person PowerPoint presentation. An educational pamphlet regarding CCS and a “Women’s Health Checklist” was filled out by nursing staff then provided to all women ages 21-64 years during the 12-week intervention period.

Implications/Conclusion: The intervention utilizing the educational handout and “Women’s Health Checklist” was not found to increase the percentage of appointments; however, a statistical significance was found in the confidence level of participants of the in-person

presentations regarding understanding of CCS guidelines. Also, most participants agreed and/or strongly agreed that the presentation was helpful, thus showing that provider and staff education is an important component in increasing CCS rates. This highlights that review of guidelines with certain provider groups (especially resident physicians and advanced practice providers) may be most beneficial for future educational interventions.

Key words: Cervical Cancer, Provider Education, Patient Education, Rural Health, Cancer Screening

Increasing Cervical Cancer Screening in a Rural Population through an Educational Intervention

In the United States, cervical cancer screening (CCS) rates have been decreasing in many geographical areas, however, according to Yu, Sabatino, & White (2019), women who reside in rural areas have higher incidences of cervical cancer than those who live in urban areas (Yu, Sabatino, & White, 2019). Women have been found to be less likely to receive a CCS or respond to abnormal results when they are of low socioeconomic status and low educational completion (Akinlotan et al., 2017). Numerous issues have been attributed to the lack of screenings for cervical cancer in women who reside in rural communities. Issues such as incomplete education from providers, lack of knowledge for the importance of screening for cervical cancer, decreased access to health care, lack of insurance or underinsurance are just a few barriers patients face in rural areas (Akinlotan et al., 2017). Lack of education for both providers and patients appear to be one of the largest barriers that contributes to low CCS rates in rural communities and is one that needs to be addressed to increase the rate of screenings and decrease the rate of cervical cancer. It is the providers who play the pivotal role in making the necessary changes to increase CCS rates. Implementation of CCS education that is based on theory has been found to increase screening rates in women (Musa et al., 2017). While education is an important component to increasing CCS rates, some studies have found that reminder interventions for patients have also been attributed to increasing CCS rates (Musa et al., 2017). This paper discusses a QI project that is aimed at improving CCS rates in a rural Mid-Michigan clinic through a multi-faceted approach which includes healthcare provider education, patient education, and a reminder process that is presented as a women's health checklist.

Background and Significance

Fourteen thousand new cases of cervical cancer were diagnosed in America in 2021 (National Institutes of Health [NIH], 2021). Over half of all newly diagnosed cases of cervical cancer are in women who have never been screened or who have failed to be screened in the last five years (Center for Disease Control and Prevention [CDC], 2020). Human Papillomavirus (HPV) is the most spread sexually transmitted infection (STI) in the United States and is the cause of nearly every case of cervical cancer (Mohammed et al., 2018). Ninety-three percent of new cancer cases could be prevented from cervical cancer screening (CCS) and receiving the HPV vaccine (CDC, 2020).

Cervical cancer often has no signs or symptoms in its early stages, which is why regular screening is vital for preventing the progression of it to later stages (American Cancer Society [ACS], 2020). Various organizations, including the United States Preventive Services Task Force (USPSTF) and the ACS, have published clinical practice guidelines providing recommendations for screening which aim to reduce morbidity and mortality from cervical cancer. Because of screening, deaths from cervical cancer in America have declined by over 50% in the last 60 years (ACS, 2021).

Despite an overall nationwide decrease in cervical cancer deaths, certain communities face disparities in screening and outcomes for cervical cancer. In a study by Yu, Sabatino, & White (2019), it was found that women living in rural communities have higher incidences of cervical cancer at every stage (localized, regional, and distant) than women living in urban settings. Women of low socioeconomic status and low educational completion have been found to be less likely to receive a CCS or attend follow up appointments when an abnormality is detected (Akinlotan et al., 2017). According to the Rural Health Information Hub ([RHlhub],

2019), those who live in rural areas are more likely to fall into the categories of low socioeconomic status and uninsured than those who live in other geographical areas.

Current evidence suggests multiple factors contribute to low rates of CCS in rural communities. These include incomplete or unclear education from providers about the importance of CCS, such as not using layman's terms or presenting education in a way that is not understandable to the patient, a lack of awareness in the women who reside in rural health communities, decreased access to health care, and lack of insurance or underinsurance (Akinlotan et al., 2017).

Problem Statement

Deaths from cervical cancer have decreased with the advent of screening and the HPV vaccine. Despite these improvements, rural areas continue to have greater incidence of cervical cancer than urban areas. Evidence shows that targeted patient and provider education can improve rates of CCS (Altere-Roberts et al., 2020; Saei Ghare Naz et al., 2018; Townsend et al., 2018). We aimed to increase provider confidence in understanding and recommending CCS as evidenced by improved posttest scores after an evidence-based educational presentation at the Spectrum Health Greenville Family Medicine (SHGFM) Clinic. We also aimed to increase the proportion of appointments made for CCS as well as the proportion of screenings performed in women ages 21-64 by 20% during a 12-week intervention period.

Gap Analysis

To identify the underlying factors contributing to the low rates of CCS, an Ishikawa (cause-and-effect diagram) was utilized and can be found in Appendix A. Major categories include people, the environment, processes within the clinic setting, as well as patient and

provider knowledge and beliefs. Through identification of project barriers, there is an opportunity to identify areas of improvement for increasing CCS rates and appointments scheduled for CCS.

Providers play a pivotal role in not only bringing up the topic of CCS, but in how they communicate and educate about the importance of screening. Areas of low health literacy have lower overall rates of CCS (Akinlotan et al., 2017). According to Musa et al. (2017), implementing CCS education that is theory based, especially in those with low health literacy, increases screening rates in women thus validating the importance of providers educating in a way that meets the patient at her level of understanding. Patient factors related to screening hesitancy include costs associated with screening, anxiety, embarrassment, or discomfort with having a male physician (Akinlotan et al., 2017). Environmental barriers consist of time constraints as well as transportation issues related to rural location (Akinlotan et al., 2017). Identified processes within the clinic setting that may lead to decreased rates of CCS include not updating patient charts to reflect most recent screenings and lack of effective processes to remind patients about overdue screenings.

Evidence Based Quality Improvement Model

Health Belief Model

The Health Belief Model (HBM) is an evidence-based model designed to explain why people do not participate in disease prevention or detection programs, such as cervical cancer screenings (Glanz, Burke, & Rimer, 2018). A fundamental focus of the HBM is on health motivation. The HBM proposes that people's willingness to embrace a health behavior is based on their understanding of the severity of a disease or illness, their personal susceptibility to disease or illness, combined with their understanding of the effectiveness of the recommended

behavior change (Glanz et al., 2018). This belief can be influenced by outside factors such as the media, reminders from the provider's office, and learning of a friend or loved one who has the illness or disease (Glanz et al., 2018).

Multiple studies have shown that interventions based on the HBM increase women's knowledge and awareness of cervical cancer, change their beliefs about CCS, and ultimately increase CCS uptake (Musa et al., 2017; Saei Ghare Naz et al., 2018). For this reason, the HBM was chosen as a theoretical framework for this multifaceted quality improvement project. It was used as a guide to develop and focus the intervention for the patients in this rural community clinic.

The HBM aided in identifying the providers' knowledge, perceptions, and perceived patient barriers to CCS. This helps improve the provider's ability and willingness to recommend and educate patients on proper CCS. It also assists in understanding the patient population by identifying socioeconomic status, education level, structural variables, and their perceived susceptibility and severity of developing cervical cancer. This information helps to develop the cues to action and targeted interventions to prompt the patients to have their CCS performed. These interventions include providers educating patients about cervical cancer and screenings, the use of an educational infographic, and a women's health screening checklist tool. See Appendix B for the details of how the HBM was utilized for this quality improvement project.

PDSA Model

The plan-do-study-act (PDSA) cycle is a widely accepted method to provide structure for quality improvement (QI) projects in healthcare settings (Taylor et al., 2014). The PDSA model

was used as the basis for the QI project taking place at the SHGFM clinic. See Appendix C for further details and a visualization of how the PDSA model was integrated into this QI project.

The ‘plan’ stage is used to identify the specific need for improvement (Taylor et al., 2014). This stage is complex and takes specific planning and data collection. The ‘plan’ stage was used to review current CCS rates at SHGFM, research evidence-based practice (EBP) recommendations for CCS improvement, and perform a gap analysis to determine the correct intervention for this clinic. The authors designed an educational intervention for patients and providers, determined the length the intervention will be implemented, designed methods for data collection, and determined the desired outcomes.

The ‘do’ phase is the actual implementation of the developed intervention (Taylor et al., 2014). This stage consisted of holding an educational session for providers and clinical staff to update them on the current CCS guidelines. Pretesting and post testing were performed to determine if there has been a change in knowledge in both the providers and the clinical staff. The second step of the ‘do’ phase involved providing an educational pamphlet with a health screening checklist to all women ages 12-64 during the 12-week interventional period.

The ‘study’ stage is used to determine the success of an intervention (Taylor et al., 2014). The authors compared the previous proportion of CCS and CCS appointments being made at SHGFM with the proportion of CCS and CCS appointments made during and after the intervention period was completed.

The ‘act’ phase is used to identify ways to change or modify the intervention to make it more successful (Taylor et al., 2014). This phase involved determining if the intervention was successful and whether it should be implemented permanently into the clinic with or without

modifications. They also determined if the intervention could possibly be implemented successfully into other family medical clinics.

Synthesis of Evidence

Search Strategies

A systematic literature search was performed to find the available evidence on educational interventions aimed at improving CCS rates. Two searches were performed in CINAHL and PubMed. Key search terms included “cervical cancer” AND screen*, AND patient* OR provider* AND educat*. A total of 575 articles resulted, 187 from CINAHL, and 388 from PubMed.

Selection Criteria

Studies were chosen based on outcomes of increasing CCS rates in women ages 21-64 years of age. Inclusion criteria included education as the primary focus of the intervention. Study publication dates were limited to the years between 2017 and 2021. Studies were excluded if they were non-U.S. based, not reported in English, or were too specific to one population. After selection criteria were applied and duplicates removed, 40 articles were reviewed for quality and content. One article was selected from the 187 articles from CINAHL, and eight articles were selected from the 388 articles from PubMed. Selection criteria can be viewed in the PRISMA Diagram in Appendix D. The nine articles selected for appraisal involved increasing the uptake of CCS rates in women ages 21-64 years who are seen in an outpatient clinic setting and included interventions, outreach incentives and barriers. The articles used for this systematic review are briefly described in Appendix E.

Education Modalities

Multiple research articles used various methods of education. This included group education (Altere-Roberts et al., 2020; Saei Ghare Naz et al., 2018; Townsend et al., 2018), individual education (Altere-Roberts et al., 2020; Musa et al., 2017; Agide et al., 2018; Falk, 2018), education through radio stations and media (Aletere-Roberts et al.), electronics and internet applications (Moscicki et al., 2021) and brochures or pamphlets (Saei Ghare Naz et al., 2018; Altere-Roberts et al., 2020). The systematic review by Saei Ghar Naz et al., (2018), highlighted the broad range of educational interventions that showed overall positive outcomes in cervical cancer knowledge and screening rates. Educational interventions that were as brief as providing an educational pamphlet, making a telephone call, or even having in-person sessions ranging from 15-minutes to hour-long visits all showed promising results in increasing both knowledge and rates of CCS (Saei Ghare Naz et al., 2018). This highlights that regardless of educational modality, patient knowledge is key to increasing CCS rates.

Individual Patient Education

Multiple studies showed an uptake in CCS when patients were educated using one-on-one techniques (Altere-Roberts et al., 2020; Musa et al., 2017; Agide et al., 2018; Falk, 2018). One-on-one education was found to be beneficial because it can be tailored to each patient's needs, cultural background, and beliefs (Atere-Roberts et al., 2020). Multiple education modalities can be used to address each patient's learning style (Atere-Roberts et al., 2020).

Patient Education in Group Settings

Three articles showed an increase in CCS after group education sessions (Altere-Roberts et al., 2020; Saei Ghare Naz et al., 2018; Townsend et al., 2018). In one of the studies, a program called Inside Knowledge, hosted by the Centers for Disease Control (CDC) in a public forum,

was found to be exceptionally beneficial in increasing the knowledge of both patients and providers. This was determined by giving a pretest to participants prior to the intervention and a posttest after. Other group educational interventions included mother/daughter educational sessions as well as educational conferences, lectures, and group training sessions which allowed for group discussion with question/answer sessions (Saei Ghare Naz et al., 2018).

Provider Education

Articles reviewed showed improvements in CCS when providers were educated about current guidelines as well (Townsend et al., 2018; Heidemann et al., 2021). However, in the study by Moscicki et al., provider mobile phone applications plus patient education tools were introduced in the clinic setting, and despite the introduction of the educational tool, there was no change in CCS rates in the first 18-month period compared to the control group (2021). In the article by Heidemann et al., phase one of the study included educating providers on the current guidelines for cervical cancer screenings and proper Pap techniques via PowerPoint presentations, which contributed to the increase in CCS rates (2021). One article studied whether continuity of care (COC) would have an impact on increasing CCS rates in women; however, it was found that the women in the COC group had lower rates of screenings, and it was recommended that providers be educated on updated guidelines (Li et al., 2020).

Theoretical Framework Interventions

Multiple systematic reviews highlighted the importance of utilizing theoretical frameworks for educational interventions (Altere-Roberts et al., 2020; Falk, 2020; Musa et al., 2017; Saei Ghare Naz et al., 2018). Most cited theoretical frameworks were PRECEDE-PROCEED (Altere-Roberts et al., 2020; Saei Ghare Naz et al., 2018), Transtheoretical Model (TTM) (Altere-Roberts et al., 2020; Saei Ghare Naz et al., 2018), Theory of Reasoned Action

(TRA) (Falk, 2020), Health Belief Model (HBM) (Musa et al., 2017; Saei Ghare Naz et al., 2018) and Social Cognitive Theory (SCT) (Altere-Roberts et al., 2020; Musa et al., 2017; Saei Ghare Naz et al., 2018). Educational interventions based on theoretical frameworks are shown to be effective in cervical cancer prevention (Saei Ghare Naz et al., 2018; Musa et al., 2017). The HBM and SCT in particular, showed positive outcomes related to awareness and knowledge about screening when used with educational interventions in communities of low-literacy levels (Musa et al., 2017).

Outreach Interventions

Education was not the only component involved in increasing CCS rates in women ages 21 to 64 years. Some studies included interventions such as phone calls and reminder letters about overdue Pap smears, advertising, incentivizing visits with free parking vouchers, standardized scripting for staff when speaking about incorporating CCS into the patient's current visit, and purposely billing the encounter as a preventative care visit to avoid co-pays (Atere-Roberts et al., 2020; Heidemann et al., 2021; Saei Ghare Naz et al., 2018; Musa et al., 2017). These types of interventions were found to be helpful in increasing CCS rates, especially when paired with education.

Barriers

Barriers to CCS were found to be a common theme among multiple articles. Falk (2018) described multiple barriers including mistrust in the medical community, poor prior medical experiences, as well as patient fear of screening results. Other barriers included lack of awareness and education from both patients and physicians regarding CCS (Li et al., 2020; Agide et al., 2018, Falk, 2018). Due to providers lacking awareness about current CCS guidelines, women receiving COC were found to have lower screening rates (Li et al., 2020).

Atere-Roberts et al. (2020) highlighted the structural barriers that women in rural areas face. These include issues with reliable transportation, the physical distance required to travel, as well as decreased number of specialty providers (Atere-Roberts et al., 2020).

Summary

This systematic literature review showed clear evidence for a need to increase the rate of CCS in the outpatient clinical setting (Atere-Roberts et al., 2020; Musa et al., 2017; Li et al., 2020; Heidemann et al., 2021). The research shows that education for both providers and patients appeared to be a key component in increasing CCS rates (Agide et al., 2018; Atere-Roberts et al., 2020; Heidemann et al., 2021; Falk, 2018; Musa et al., 2017; Saei Ghare Naz et al., 2018; Townsend et al., 2018). Various modalities of educational interventions, including outreach interventions, show promising results for increasing both individual knowledge about CCS, as well as overall screening rates in clinic settings (Saei Ghare Naz et al., 2018). Education that is guided by a theoretical framework shows particularly positive outcomes in increasing knowledge about CCS (Atere-Roberts et al., 2020; Falk, 2020; Musa et al., 2017; Saei Ghare Naz et al., 2018). Finally, barriers to screening must be addressed. Understanding personal perspectives and beliefs about screening, fears about screening results, as well as the physical barriers that rural communities face can only help to better educate and provide resources in an effort to prevent morbidity and mortality from cervical cancer (Li et al., 2020; Agide et al., 2018, Falk, 2018; Atere-Roberts et al., 2020).

Goals, Objectives, and Expected Outcomes

The primary objective was to increase the proportion of appointments made for CCS as well as the proportion of screening performed in women ages 21-64 by 20% during a 12-week intervention period. This was done through providing a “Women’s Health Checklist” to every

woman aged 21-64 who was seen in the office during the 12-week intervention period. The secondary objective was to increase provider confidence in understanding and recommending CCS. Secondary data was collected in the form of pretest and posttest questionnaires, which were distributed before and after education was given to the providers. Goals were developed to be specific and measurable to meet expected outcomes.

Methods

Clinical Site Description

Spectrum Health Greenville Family Medicine (SHGFM) is one of 150 ambulatory care clinics within the Spectrum Health integrated health system, which are located throughout Western Michigan. Their mission is to improve health, inspire hope, and save lives (Spectrum Health, 2021). Greenville is a rural community located in west central Michigan with a population of just over 8,400 as of the 2010 census (U.S. Census Bureau, 2019). Some demographics of the Greenville community include:

- 55.2% Female
- 95% White
- 0.9% Black or African American
- 4.0% Hispanic or Latino
- 90.7% high school graduate or higher
- 12.5% bachelor's degree or higher
- 4.8% without health insurance (and <65 years)
- 52.5% of females are in the labor force
- \$35,536 is the median household income
- 20.3% are considered to be in poverty

SHGFM has a total patient population of 6,716 as of June 2021. Fifty-five percent of the patient population are female and 44% of the population are between the ages of 25-64 (J. Snyder, personal communication, June 6, 2021). Interdisciplinary team members include physicians, advanced practice providers (APPs), resident physicians, registered nurses, medical assistants, nursing managers, and office staff. Members of the SHGFM provider team include:

- 2 attending Doctors of Osteopathy (DOs)
- 2 Physicians Assistants (PAs)
- 9 Resident Physicians
- 2 Registered Nurses (RNs)
- 10 Medical Assistants (MAs)
- 1 Licensed Practical Nurse (LPNs)

SHGFM fulfills their mission of improving the health of their community through encouraging preventative health screenings. Current practices for CCS include:

- Integrative computer system that alerts providers of overdue preventative health screenings
- MA chart prep one week prior to visit that includes identification of patients overdue for screening and flagging of the chart to notify providers to address CCS at the upcoming visit
- Pending of Pap or HPV testing orders in electronic medical record (EMR)
- Patient health care portal notifications of overdue preventative health screenings

Ethical Considerations & Protection of Human Subjects

This quality improvement project was submitted to Michigan State University (MSU) and Spectrum Health Institutional Review Boards (IRB) for approval prior to project implementation. The project was submitted to the MSU IRB via form 512 on September 2, 2021. An IRB coordinator was assigned on September 3, 2021, to the submission. Correspondence was received from the IRB coordinator on September 3, 2021 asking if permission had been granted from the SHGFM to begin the intervention. Proof in the form of the Spectrum Health Facility Agreement letter was uploaded to the IRB coordinator that same day. Approval for intervention was given on September 7, 2021, and the project was deemed not human research. The process for applying to Spectrum Health's IRB began on September 14, 2021. Due to delays in getting access to the facility's IRB website, it was not submitted until September 21, 2021. It was deemed non-research human research on September 28, 2021, and approval was given to proceed with the project at that time.

Our original timeline, as referenced in Appendix F, showed that the implementation for providers would begin on September 26, 2021. However, due to a delay in receiving approval from the Spectrum Health IRB, this date was pushed back to October. Provider participation in CCS education and survey-taking was voluntary. All data collected from patient charts was de-identified in compliance with organizational privacy policies.

Setting Facilitators and Barriers

SWOT analyses are useful in strategic planning for identifying organizational facilitators and barriers (Jones & Roussel, 2020). This includes identifying areas where organizations are already succeeding (strengths and opportunities) as well as identifying organizational weaknesses (weaknesses and threats). Identifying the known and anticipating the unknown help

guide a successful project (Jones & Roussel, 2020). A needs assessment which identifies SHGFM's strengths, weaknesses, opportunities, and threats can be reviewed in Appendix G.

A lack of provider knowledge about current CCS guidelines and patients' minimal knowledge about the importance of routine screening for cervical cancer were identified weaknesses. Threats to the project included transportation barriers, time barriers for both the patient and provider, patient unwillingness to have CCS, and patient out of pocket costs associated with health visits. We aimed to address the weaknesses of patient and provider knowledge deficits, the threat of time constraint, as well as the threat of patient unwillingness to have CCS by capitalizing off the identified strengths and opportunities at SHGFM. These strengths included involving a motivated and knowledgeable community partner and manager at SHGFM and utilizing the project members' understanding of current evidence-based CCS guidelines. This provided an opportunity to improve provider knowledge about evidence-based CCS guidelines, improve patient knowledge about the importance of CCS, and have an overall increase in the number of CCS appointments scheduled and completed at SHGFM.

Intervention and Data Collection Procedure

We first evaluated the baseline percentage of appointments made for CCS and Pap Smears performed at SHGFM twelve weeks prior to the intervention's start. This data was obtained by the SGHFM practice manager through electronic health record (EHR) auditing. The data was broken down into three, four week increments between August 1, 2021, and October 26, 2021. This baseline data can be viewed in Appendix L and is highlighted in green.

We then began the process of education to staff and providers. Two in-person educational sessions were held on October 25th and 26th, 2021. Each staff member and provider were given

an anonymous and de-identified paper pretest survey to complete prior to the educational session. After each person had completed the pretest, a brief 30-minute PowerPoint presentation on USPSTF and American College of Obstetrician and Gynecologists (ACOG) guidelines for CCS was given. The presentation included 1) a process flow of the patient educational portion of the project (educational handout and women's health checklist); and 2) recommendations for provider/patient discussions to include the importance of CCS and the current recommended screening schedules. For reinforcement of information presented and in an effort to provide tools for the staff, we provided printed copies of the presentation slides and the patient educational handout with the women's health checklist. Once the presentation was completed, we had each person complete the posttest questions that were located on the backside of the survey. The surveys were then gathered and matched with the pretest for evaluation.

The anonymous and matched survey gauged knowledge and confidence in understanding and recommending CCS guidelines while utilizing an evidence-based Likert-type questionnaire developed by the authors. After an exhaustive search, no current research-tested survey tools about these subjects were found. This survey was developed by the authors to garner information from the participants in the educational sessions. This survey includes simple de-identified demographic information, tests knowledge delivered during the educational session, staff satisfaction with current EHR preventive health screening alerts, and current barriers to patients receiving Pap testing. Pre-and post-survey results were analyzed for overall improvement in knowledge and confidence after educational intervention. The survey utilized can be found in Appendix J.

On October 27, 2021, our intervention of providing an educational pamphlet with a screening reminder checklist began. Any woman between the age of 21-64 who had a health visit

in the 12-week intervention period was provided an educational pamphlet and women's health screening reminder checklist. Both the educational pamphlet and health reminder checklist were sent home with the patient after their appointment as an educational and health guideline reference. An image of the educational pamphlet and women's health screening checklist that was provided can be found in Appendix I.

Data was obtained to evaluate the change in the proportion of appointments made for CCS and CCS performed from twelve weeks prior. The intervention data was obtained in the same fashion as the baseline data, through an EHR audit by the SHGFM manager. Intervention data was provided in four-week intervals ranging from the start date of October 27, 2021, to intervention end date of January 21, 2022. Additionally, four more weeks of data ranging from January 22, 2022, to February 18, 2022, were provided to evaluate if any further improvements in the percentage of CCSs performed or scheduled screenings were observed. Data can be found in Appendix L, with pre-intervention data highlighted in green, intervention data highlighted in blue, and post-intervention data highlighted in purple.

Timeline

This quality improvement project took place over the course of three semesters, starting in the summer of 2021 and finishing in the spring of 2022. The provider and patient educational intervention took place over the course of 12 weeks during the fall/spring of 2021-2022 with outcome measurements and analysis of the data occurring in the spring of 2022. A complete timeline can be reviewed in the GANTT Chart in Appendix F.

Data Analysis

Staff and Provider Education

Appendix K outlines the pre-and post-survey results. A total of 14 staff and providers attended the educational presentation and completed pre-and-post testing. First evaluated was confidence in understanding current CCS guidelines. Seven staff members and providers (2 DOs, 1 Resident, 1 PA, 3 MAs) reported no change in confidence in understanding screening guidelines after education. Seven staff members and providers (2 residents, 1 PA, 1 RN, 3 MAs) reported positive change in confidence in understanding screening guidelines after evaluation. A matched T-test performed resulted in a P-value of 0.0058, showing a statistically significant outcome.

The confidence in recommending CCS was also evaluated. Ten staff members and providers (2 DOs, 1 Resident, 1 PA, 1 RN, 5 MAs) reported no change in confidence in recommending screening guidelines after education. Three staff members (2 residents and 1 PA) reported a positive change in confidence in recommending screening guidelines after education. One MA did report a negative change in confidence after education, however this is suspected to be an error in selection choice, as pretest rating was 5 and posttest rating was 4. A matched T-test performed resulted in a P-value of 0.2177, showing an outcome that was not statistically significant.

A single posttest question to evaluate whether the educational presentation was considered helpful was evaluated. All fourteen clinical staff members and providers responded. Only one provider (DO) was neutral, however three providers and six staff members agreed that the presentation was helpful, with the remaining seven strongly agreeing that the presentation was helpful.

Cervical Cancer Screening Appointments Made

Twelve weeks prior to intervention start, the proportion of CCS appointments made for women ages 21-64 was 5.46%. During the 12-week intervention period (10/27/2021 - 11/21/2021), there was a decrease in the proportion to 4.73% of appointments made. Although the overall average proportion of appointments made did decrease between the two 12-week periods, the proportion of appointments gradually increased during each of the four-week intervention periods. During the first four weeks of the intervention, the proportion of appointments made was 4.38% (a -14.76% change from four weeks prior). Eight weeks into the intervention, the proportion increased to 4.84% (a 10.65% change) and 12 weeks into the intervention, the proportion further increased to 4.96% (a 2.48% change). Four weeks after the intervention ended there was a decrease in the proportion to 4.46% (a -10.22% change).

Cervical Cancer Screening Performed

The proportion of CCS performed in the 12 weeks prior to intervention was 7.35%. During the 12-week intervention period, the proportion of CCS performed decreased to 6.35%. Despite the overall decrease, the proportion of CCS performed showed a positive trend during the intervention, similar to the trend observed with appointments made for CCS. The first four weeks of the intervention showed CCS at 5.03%, which was a -35.58% change from four weeks prior. Eight weeks into the intervention, CCS increased to 5.57% (a 10.65% change), followed by 8.44% (a 51.49% change). Four weeks after the intervention ended there was a decrease in the proportion of CCS performed to 6.93% (a -17.85 % change). Complete data for CCS appointments and screening performed can be viewed in [Appendix L](#).

Barriers to Implementation

The first barrier encountered in the project was related to communication. Initially, it was decided that updates on project implementation and staff adherence to providing the women's educational pamphlet and checklist would be received via email through the site manager. Within a few weeks of project start, it was realized that communication with the site manager via email alone in addition to not having direct communication and feedback from staff about the success of project implementation was a challenge. During weeks 5-12 of the project (11/25/2021-1/21/2022) project members did make five site visits to SHGFM to evaluate the workflow of handing out checklists and obtain first-hand staff and provider feedback.

After discussion with staff and providers, it was found that there was confusion regarding which patients should receive the checklist, who was responsible for distributing the checklist to the patients, and what to do with the checklist after the appointments' completion. This was resolved by developing and distributing a tip sheet to staff which included a step-by-step breakdown of who was to fill out the checklist, who was to distribute it, and what the provider's role was in the process. Appendix M contains the staff tip sheet for reference.

It was also determined that handouts printed at SHGFM were not easily readable due to background and font coloring. This was resolved by adjusting the color to make the background lighter and increasing the font size to make for easier reading. The revised educational pamphlets and women's health checklists were then taken to a professional printer, with new copies provided to staff. A template of the revisions was sent to the SHGFM office manager for future printing as needed.

Finally, there were concerns expressed by staff that multiple checklists were being or potentially could be distributed to the same patient at various appointments. There was not a process for tracking the checklists and determining who had and had not received a checklist.

Through discussions with staff, it was agreed that the MA's would place a "quick note" in the patient's EMR thereby documenting which patients had received the checklist.

Sustainability Plan

Provider and MA education on current USPSTF and ACOG guidelines in the SHGFM office did show a significant increase in their confidence in understanding and recommending CCS guidelines. Annual education for providers regarding current CCS guidelines may be beneficial to not only keep providers updated but also to reach any new providers who come into the SHGFM office. At this time, there is no plan to continue with annual education at SHGFM.

While the "Women's Health Checklist" is a useful tool, it can be time consuming for MAs to fill out for all women ages 21-64 years who came in for an appointment at SHGFM. Despite the extra work, one MA did describe feeling it was worth the effort, and many MAs described the women who received the educational pamphlet and checklist as receptive. Both MAs and providers described the preventive screening checklist as helpful for knowing which screenings patients are due for. Every patient who received the educational pamphlet and checklist during the intervention period left the office with it.

The handout and preventive screening checklist continue to be used by some (but not all) of the staff for chart prep and is provided to patients who present for women's wellness visits. The office manager does plan to track the CCS numbers through the end of the year with a mid-year focus on using the handout and screening checklist to try to increase screening numbers further if they are low.

Implications for Practice

The staff and provider education showed promising outcomes related to increasing confidence in understanding and recommending CCS to patients. Half of those present reported positive change in confidence in understanding screening guidelines after education, and three staff/providers reported positive change in confidence in recommending screening guidelines after education. Of note, one resident and one PA showed the greatest change between pretesting and post-testing for confidence in understanding and recommending CCS (with a 2+ positive change). This highlights that review of guidelines with certain provider groups (especially resident physicians and APPs) may be most beneficial for future educational interventions. With 13 out of the 14 staff and providers agreeing or strongly agreeing that the educational presentation was helpful, this intervention shows positive promise for future educational initiatives.

While intervention data did not show an overall increase in the proportion of women scheduling appointments for CCS or completing their CCS, there was a steady increase in the proportion of appointments made for CCS and in the proportion of CCS performed throughout the 12 week intervention period. The greatest increase for appointments made was between weeks four to eight, where the proportion increased from 4.38% to 4.84%, resulting in a 10.65% positive change. The highest increase for CCS performed was at eight weeks in, where the proportion increased from 5.57% to 8.44%, resulting in a 51.49% positive change. Considering the 12-week pre-intervention data showed proportions in both CCS appointments and CCS performed that fluctuated significantly (stark drops followed by stark increases), it can be argued that the steady and consistent increase during the intervention period was due to the students checking in with staff more frequently thus encouraging the pamphlet and checklist use. This

steady increase in proportions could also be due to MAs and providers becoming more comfortable with the pamphlet and checklist use. At every check in the feedback showed that staff were understanding the process and utilizing the checklist more often.

Our recommendations for future efforts include having a project member available at the office on implementation day to answer questions and encourage the use of the pamphlet and checklist, as well as providing a tip sheet early on in the project to distribute to staff and providers. It may be beneficial to track data differently; measuring the number of women due or overdue for CCS, of those women how many received the checklist, made an appointment for CCS or had CCS performed. This would allow for direct matched data to show a true measurement of the educational handout and checklist success, instead of measuring all women (who may or may not truly be due for CCS). Finally, having an intervention window greater than a 12-week period would be beneficial as an evaluation of longer-term success, as the four weeks after the intervention period showed a stark decline in proportion for both CCS appointments made, and CCS performed.

Cost-Benefit Analysis

There were no associated costs determined for the SHGFM staff, MAs, residents, or providers. It was determined that MAs were already identifying care gaps, especially with women aged 21-65 years who were due or overdue for their CCS. Residents and providers were previously expected to discuss health care gaps for their patients before the QI project began in the fall of 2021.

The expenses noted for this intervention were for the DNP students' time, lunch and snacks provided to staff, and educational printouts such as the PowerPoint presentations, pre and

post-test surveys for the providers, and the educational pamphlets for each female patient aged 21-64 years who came into the clinic for the 12-week interventional period. The SHGFM clinic was initially covering the costs associated with printing the educational pamphlets and women's health checklists. However, it was decided that having these professionally printed would be a better avenue, as described above. The total estimated cost is \$22,051.41. For a full breakdown of the total costs see Appendix H.

Recommendations and Conclusion

CCS rates continue to decline in many different geographical zones while the rates of cervical cancer continue to increase in women who live in rural areas (Yu, Sabatino, & White, 2019). Factors that contribute to the decrease of CCS rates in rural communities are attributed to providers giving incomplete education to patients, lack of patient knowledge regarding the importance of screening for cervical cancer, decreases in access to health care, and underinsurance or lack of insurance (Akinolotan et al., 2017). The lack of providers giving complete education to patients was found to be the largest barrier (Akinolotan et al., 2017). After performing an in-depth systematic literature search, interventions that were found to be successful in increasing CCS rates included outreach interventions (Atere-Roberts et al., 2020; Heidemann et al., 2021; Saei Ghare Naz et al., 2018; Musa et al., 201) and targeted patient and provider education, with the latter being found to be highly successful (Altere-Roberts et al., 2020; Saei Ghare Naz et al., 2018; Townsend et al., 2018).

The purpose of this QI project was multifaceted with the first facet being aimed at increasing provider confidence in understanding and recommending CCS as evidenced by improved posttest scores after an evidence-based educational presentation. The second facet was aimed at increasing the proportion of appointments made for CCS as well as the proportion of

screenings performed in women ages 21-64 by 20% during a 12-week intervention period. The first intervention for this QI project included two in-person 30-minute PowerPoint educational presentations in which each clinical staff member and provider were given an anonymous and de-identified paper pretest and posttest to be completed before and after the presentation. The second intervention consisted of providing an educational pamphlet with a screening tool referred to as the “Women’s Health Checklist” which was filled out in its entirety prior to a female patient’s visit who fell into the 21-64 year age category.

Upon completion of the first intervention, the first and second questions on the posttest were evaluated for statistical significance. The first posttest question measured the confidence level that all participants felt regarding their understanding of screening guidelines after the presentation was completed, and calculations performed found the outcome to be statistically significant. The second posttest question evaluated the confidence participants had in recommending CCS after the presentation, and calculations performed found this not to be statistically significant. Finally, a single posttest question to measure whether the educational presentation was considered helpful was evaluated. Out of the 14 participants, 13 participants agreed and/or strongly agreed that the presentation was helpful while the other participant was neutral. After the second intervention was implemented during the 12-week period at SHGFM, it was noted that there was a decrease in the proportion of appointments made compared to 12 weeks prior to implementation from 5.46% to 4.73%. The proportion of CCS performed during the 12-week intervention period showed a decrease, compared to the 12-week period before intervention implementation from 7.35% to 6.35%.

Although the intervention utilizing the educational handout and “Women’s Health Checklist” was not found to increase the percentage of appointments, a statistical significance

was found in the confidence level of participants of the in-person presentations regarding understanding CCS guidelines. It should also be noted that most participants agreed and/or strongly agreed that the presentation was helpful, thus showing that education is an important component in increasing CCS rates.

While low numbers of CCS rates continue to be an issue in rural areas, it is important to realize that several barriers exist for women who live in these areas. The solution to increasing CCS rates will continue to need to be a multi-faceted approach, with education being an important facet to address women's barriers accordingly. Certain areas of this QI project, such as the provider and staff education intervention, could be utilized in conjunction with other interventions with the hope of increasing CCS rates in rural populations. Further time, education, and research is needed and recommended to improve rates of CCS in this vulnerable population of women.

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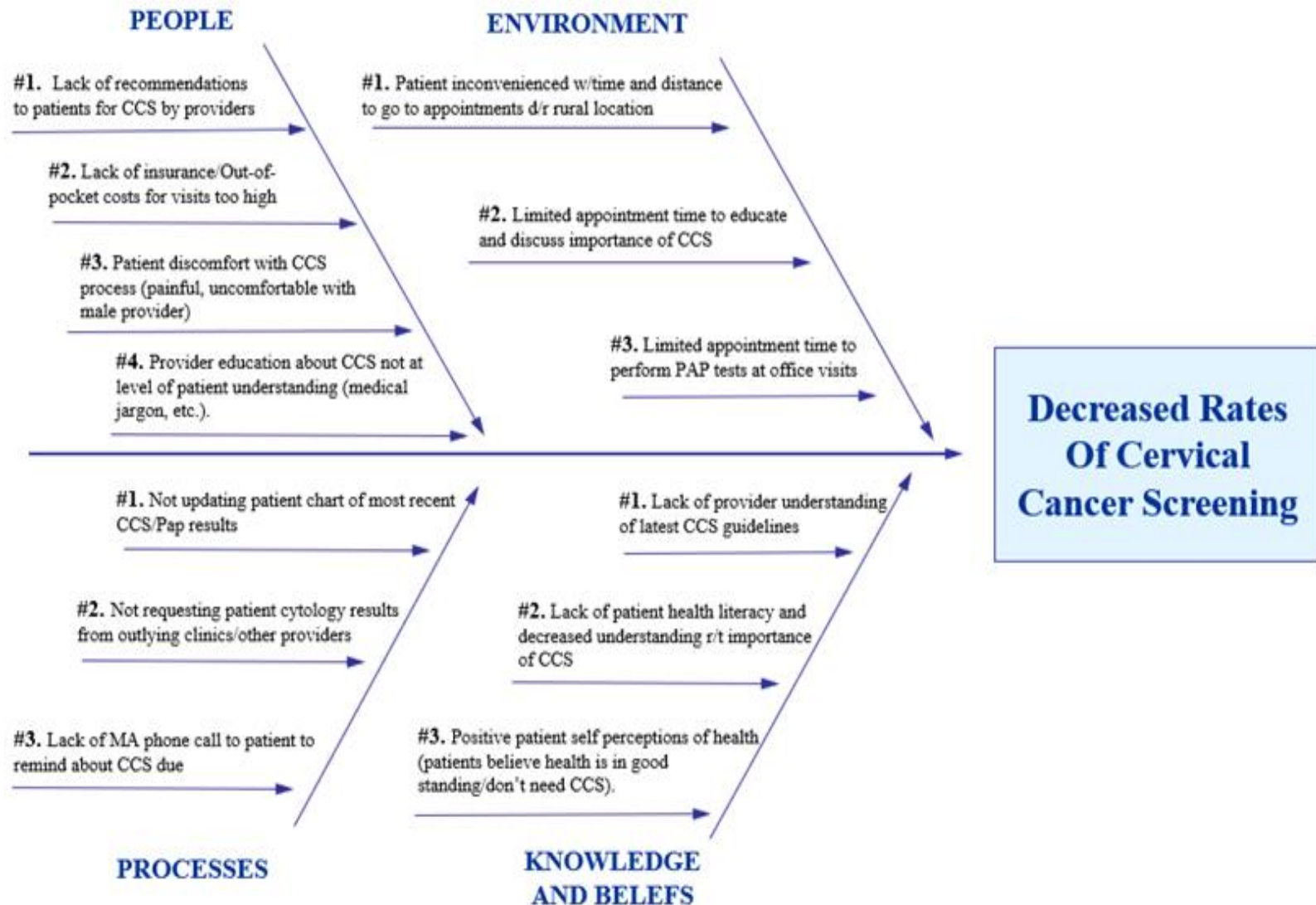
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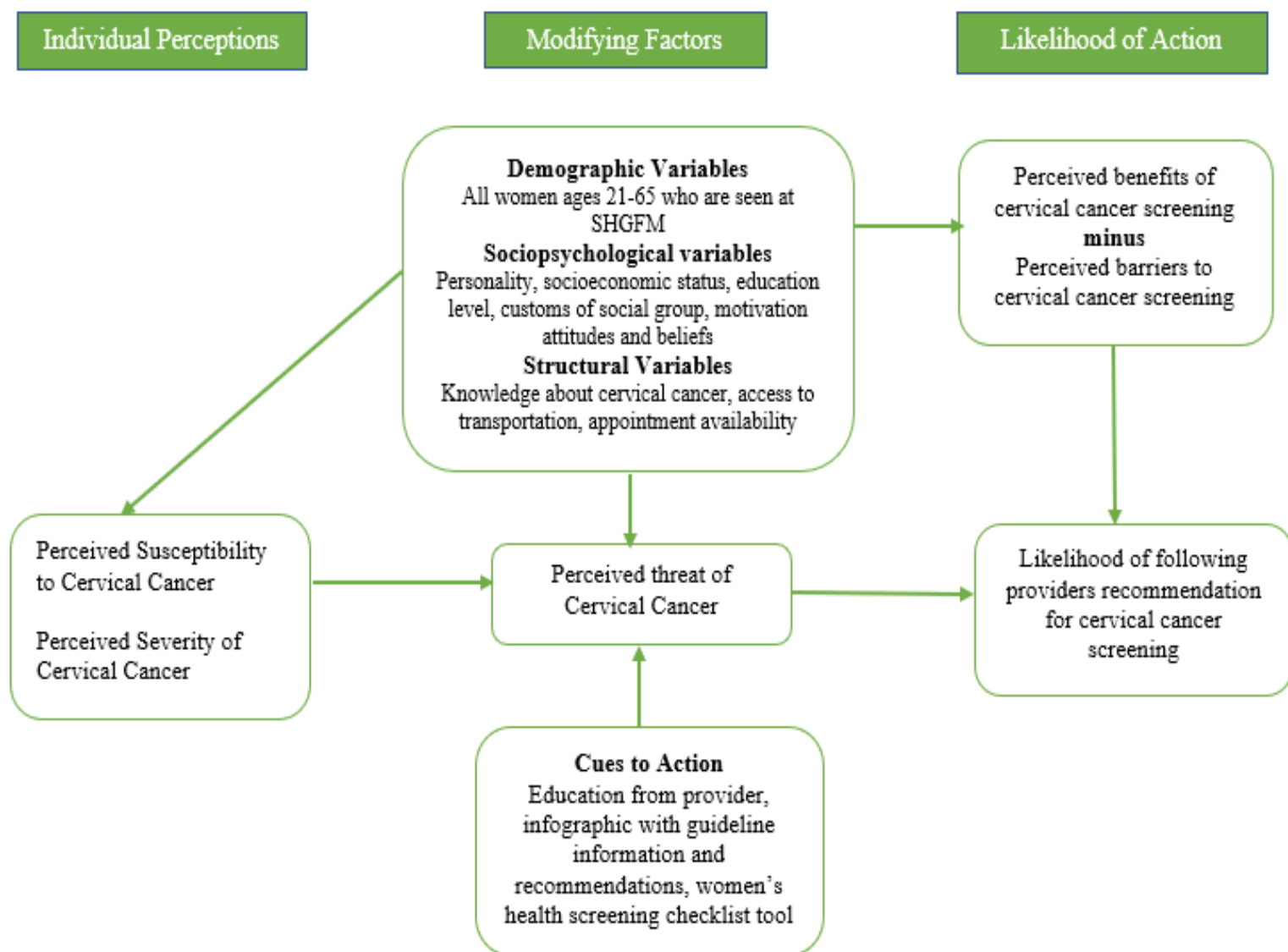
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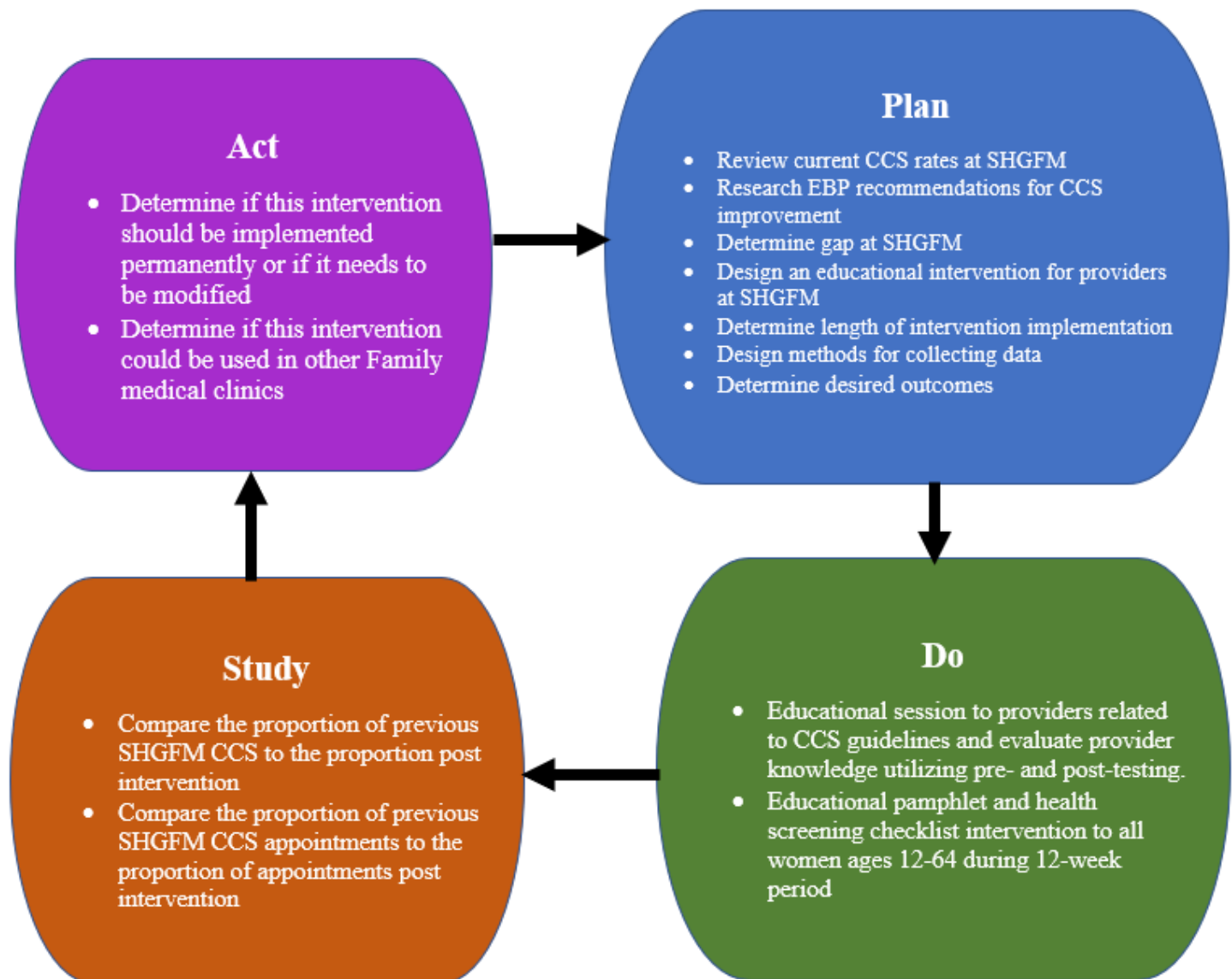
Appendix A: Ishikawa Diagram



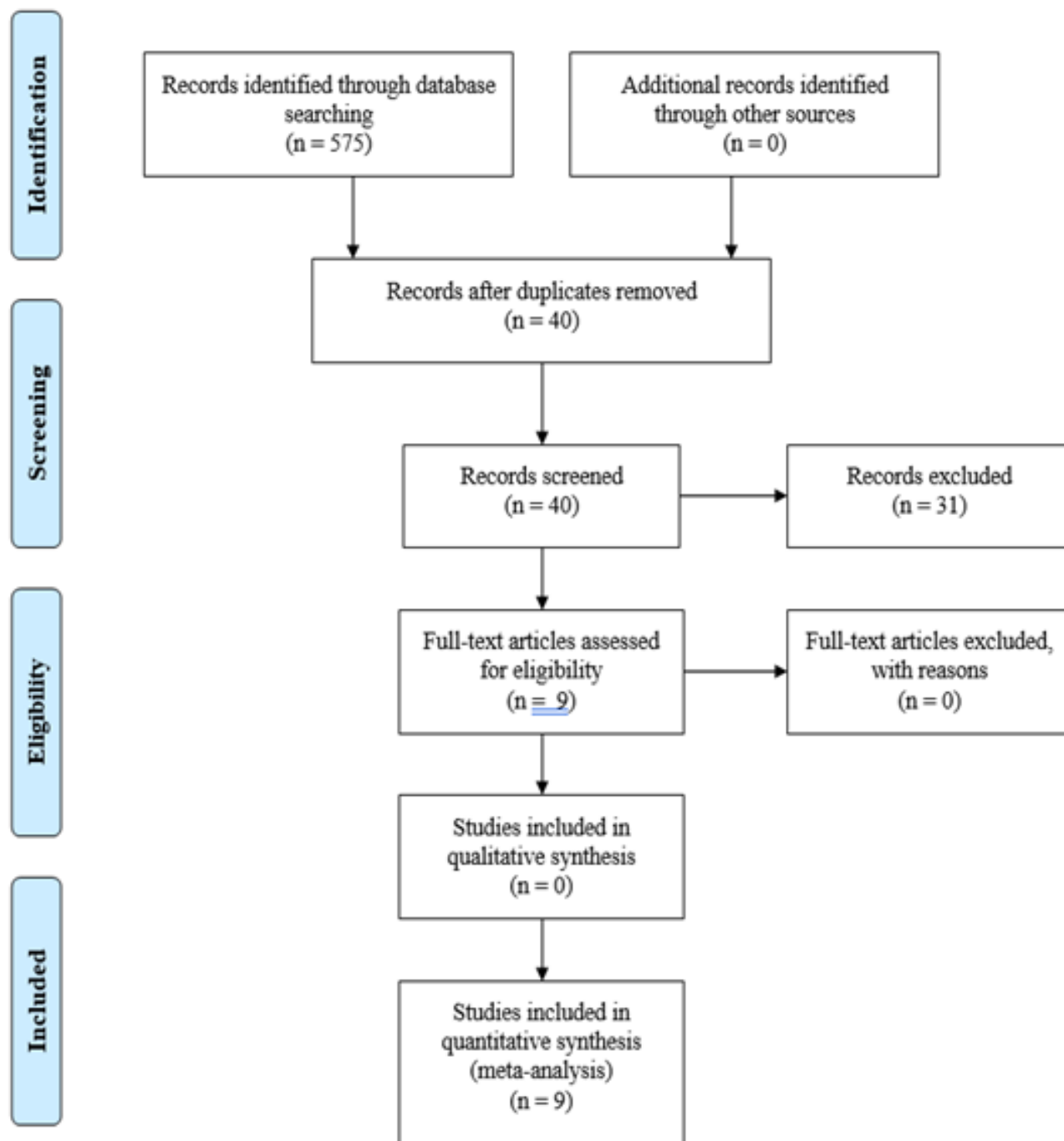
Appendix B: Health Belief Model



Appendix C: PDSA Model



Appendix D: Prisma Diagram



Appendix E: Literature Table

Author/Title	Level of Evidence	Purpose of Study	Conceptual Framework	Results	How it relates to our project	Implications for Practice
Agide et al. (2018). A systematic review of the effectiveness of health education interventions to increase cervical cancer screening uptake	Systematic Review	The purpose of the review is to determine how effective health education preventative measures are at increasing cervical cancer screenings.	None	Health education regarding cervical cancer screenings had a significant uptake in screening rates; however, the modality used for education and the different populations studied had variable outcomes.	This systematic review shows that health education to patients can increase cervical cancer screenings in various settings thus may increase the rates at Spectrum Health Greenville Clinic	-Increase cervical cancer screenings thus decreasing cervical cancer -Allows for outreach to patients and increases in trust in the patient-provider relationship
Atere-Roberts et al. (2020). Interventions to increase breast and cervical cancer screening uptake among rural women: A Scoping review	Systematic Scoping Review	Review and assess the published literature on interventions to increase breast and cervical cancer (BCC) in rural communities.	None	Interventions focused on one-time breast and/or cervical cancer screening and included patient navigation strategies, educational outreach programs, peer counseling, and small media initiatives. Both one-on-one and group educational programs were found to increase BCC screening.	Provides educational interventions in rural populations.	One-on-one education allows for direct interaction, immediately address questions, and tailor material to meet needs of specific populations.
Falk (2018). A mixed methods review of education and patient navigation interventions to increase breast	Mixed methods systematic review	Identify studies that use education and patient navigation to increase cervical cancer screening in rural health settings.	Theory of Reasoned Action (TRA)	<u>12 quantitative studies (4 RCTs) reviewed overall findings:</u> -educational program in latina women ages 50+ led to increased rate of mammogram and CC screening	-Quantitative studies highlight importance of educational intervention in increasing CCS -Qualitative studies highlight factors contributing to hesitancy, which is where areas of	-Education is vital for increasing CCS

and cervical cancer screening for rural women				<p>-increased rates of breast and CC screening when using theory-based lay health advisor education programs</p> <p><u>18 qualitative studies which found multiple factors that contribute to screening hesitancy, including:</u></p> <p>Lack of resources/cost, provider comm., medical mistrust, poor prior experiences, lack of knowledge, fear of cancer-related death, interpersonal relationships that encourage or discourage screening behavior, embarrassment</p>	<p>education and other interventions can focus (how we educate, what we educate about, providing comforting and non-embarrassing experience when getting pap)</p>	
Heidemann et al. (2021). Using a frontline staff intervention to improve cervical cancer screening in a large academic internal medicine clinic	Quality Improvement	Improve the clinic's rate of cervical cancer screening (CCS) so it matched or exceeded the national average (84%) over 18 months.	None	<p>Average number of pap tests completed per month increased from 35 to 56 in phase 1 (the first 9 months), then increased to 75 in phase 2 (the last 9 months of the study).</p> <p>Clinic population's CCS rate increased from 70% to 75% after 18 month intervention</p> <p>-phase 1 relative risk, 1.86; 95% CI, 1.64–2.10;</p>	<p>-Patient outreach (identifies women due for CCS & makes them aware via telephone call)</p> <p>-Provider education (re-educated on guidelines r/t CCS)</p> <p>-Patient incentives (offers parking voucher for appointments made for CCS)</p> <p>-MA workflow process change: if patient due for pap at any visit, standard work to ask if amenable for</p>	<p>-Patient outreach</p> <p>-Provider education</p> <p>-Patient incentives</p> <p>-Streamlined workflow process change</p>

				$P < 0.001$ -phase 2 relative risk, 2.70; 95% CI, 2.40–3.02; $P < 0.001$.	pap that same day. If so, MAs would have patient prepared for pap when provider enters room and obtain pap at that visit, saving time.	
Li et al. (2020). The impact of continuity of care on cervical cancer screening: How visit pattern affects guideline concordance	Quantitative Design	To study how continuity of care (COC) impacts cervical cancer screenings for women who are insured by Medicaid and how they are in concordance with current guidelines.	None	- Out of 466,526 person- month observations, only 2.5% of them received cervical cancer screenings in the measurement month. These were women who did not receive a PAP test in the last 36 months, and no co-testing had been done in the past 60 months. -It was determined that patients who were receiving COC had a lower rate of receiving cervical cancer screenings in accordance with current guidelines. -Due to a lower rate of cervical cancer screenings for patients who had COC, it was determined that improving COC would not improve rates. Instead, it is suggested that education for both providers and patients would be better at	This quantitative study has shown that COC in itself does not improve cervical cancer screening rates because of lack of adherence to guidelines. Instead, it is found that education to both providers and patients would be useful tool in improving cervical cancer screening rates.	-Education to providers and patients will provide a way to adhere to guidelines thus increasing screening rates.

				increasing rates.		
Moscicki et al. (2021). Effect of 2 interventions on cervical cancer screening guideline adherence	Prospective cohort study	Determine whether a provider mobile phone application, with or without a patient educational tool, would promote adherence to cervical cancer screening guidelines and management of abnormal cytology results.	None	Clinics with provider mobile phone application plus patient educational tool had similar 18-month Pap rates compared to the control group. 18-month Pap rate for provider mobile phone application plus education changed from 0.74 to 0.52 compared to provider application plus education control group 0.77 to 0.68. The 18-month Pap rate for provider mobile phone application alone had a change of 0.16 and provider application control group a change of 0.18	Provides education for providers about guidelines through a mobile phone application and an educational tool for patients to read in the waiting room via a tablet.	- Provider application with patient educational tool appears to have a greater impact than just provider application alone.
Musa et al. (2017). Effect of cervical cancer education and provider recommendation for screening on screening rates: A systematic review and meta-analysis	Systematic Review	Systematically assess how education regarding cervical cancer effects screening rates as compared to controlled conditions, and how the recommendation or cervical cancer screenings from providers to	Social Ecological Model	Theory-based education more than doubled cervical cancer screening rates. Other factors that attributed to increase in screenings were mailing of reminder letters for those who were overdue, letters of invitation to make cervical cancer screening appointments with and without phone call follow up, and the scheduling of	This systematic review has proven that giving evidence-based education to patients regarding cervical cancer screenings and also sending reminder letters, scheduling appointments and sending invitation letters increased the number of screenings; therefore, this could be a viable solution to improving cervical cancer screening rates at Spectrum	Theory-based education improves numbers for cervical cancer screenings.

		patients increases screening rates versus a controlled group		appointments increased cervical cancer screening rates.	Health Greenville Clinic.	
Saei Ghare Naz et al. (2018). Educational interventions for cervical cancer screening behavior of women: A Systematic review	Systematic Review	Systematically assess the effects of educational interventions on cervical cancer screening (CCS).	None	Different health education methods- calls, mailed postcards, consultation methods, mother/daughter education, videos, power points, educational brochures, group discussions, radio broadcast education, tailored counseling and fact sheets, lecture presentations, face-to-face interviews, and self-learning packages are all effective in CCS behavior.	-Education based on health behavior change theories helps to improve CCS behavior of women all over the world. -Education that is theory-based increases knowledge and promotes awareness and increases screening rates. -Health education methods effectively change CCS behavior.	Different educational interventions and health behavior change theories effectively increased CCS behaviors.
Townsend et al. (2018). Improving knowledge and awareness of human papillomavirus-associated gynecologic cancers: Results from the national comprehensive cancer control program/inside knowledge	Quantitative Review	The Centers for Disease Control (CDC) implemented the Inside Knowledge campaign to raise awareness for providers and women to educate about what signs and symptoms to look for in 5 HPV-related gynecological cancers. This study	None	Providers and women who attended the Inside Knowledge campaign filled out a pre and posttest and were found to have a significant increase in knowledge after the seminar had completed.	The Inside Knowledge campaign has shown via pre and posttests that providers and women who attended it have increased their knowledge of the signs and symptoms of cervical cancer. This can be used to improve cervical cancer screening rates and help women be aware of their bodies and when it is time to seek treatment.	-Gives patient more autonomy because they are knowledgeable about their bodies -Gives providers more clarity about the 5 HPV-related gynecological cancers and may educate them as to how to approach their patients regarding cervical cancer.

collaboration.		was performed to test the efficacy of the campaign				
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Appendix F: GANTT Chart

Increasing Cervical Cancer Screening in a Rural Po

Whitney Boss, Sarah Johnson, & Ingrid Kwak

Project Start: Mon, 5/17/2021

Michigan State University

Display Week:

TASK	TASK DESCRIPTION	PROGRE SS	START	END
Task 2	Project Background Research	100%	5/25/21	7/4/21
Task 3	Literature Review & Synthesis	100%	7/4/21	7/13/21
Task 4	Gap Analysis, SWOT Analysis, EB Model	100%	7/14/21	7/25/21
Task 5	Project Methods & Budget	100%	7/25/21	8/1/21
Task 6	Final Paper Revisions	100%	8/1/21	8/8/21
Task 7	Final Paper & IRB Submission	100%	8/8/21	8/13/21
Task 8	Develop Womens Prev Health Handout	100%	8/15/21	8/29/21
Task 9	Develop Provider Education Presentation	100%	8/29/21	10/6/21
Task 10	Develop Provider Questionnaire	100%	9/12/21	10/1/21
Phase 2 Implementation				
Task 1	Educate clinic staff for project implem.	100%	9/26/21	10/3/21
Task 2	Provider Education & Questionnaire	100%	10/3/21	10/10/21
Task 3	Project Implementation	100%	10/10/21	12/31/21
Phase 3 Evaluation				
Task 1	Organize and evaluate data	100%	1/2/22	1/23/22
Task 2	Analyze data and prepare	100%	1/23/22	2/13/22
Task 3	Prepare project presentation	100%	2/13/22	3/13/22
Task 4	Final project and paper edits	90%	3/13/22	4/15/22
Task 5	Present final project and paper	0%	4/17/22	4/21/22

Appendix G: SWOT Analysis

STRENGTHS	WEAKNESSES
<p>Community partner actively involved and knowledgeable about current processes (and areas of improvement) for cervical cancer screening at clinic site</p> <p>Clinic site is already taking steps to increase cervical cancer screening rates</p> <p>Graduate FNP students have good understanding of guidelines surrounding cervical cancer screening</p>	<p>Lack of provider knowledge about cervical cancer screening guidelines d/t recent guideline changes</p> <p>No current CCS educational process</p> <p>Lack of patient knowledge about importance of cervical cancer screening</p>
OPPORTUNITIES	THREATS
<p>Improve provider knowledge about evidence-based guidelines for cervical cancer screening</p> <p>Improve patient knowledge about importance of cervical cancer screening</p> <p>Improve cervical cancer screening rates</p> <p>Decrease cervical cancer</p>	<p>Patient transportation barriers for screening appointments</p> <p>Patient time constraints for cervical cancer screening</p> <p>Patient unwillingness to have cervical cancer screening</p> <p>Provider unwillingness to offer and educate about cervical cancer screening due to lack of knowledge and/or time constraints</p> <p>Lack of insurance for patient</p>

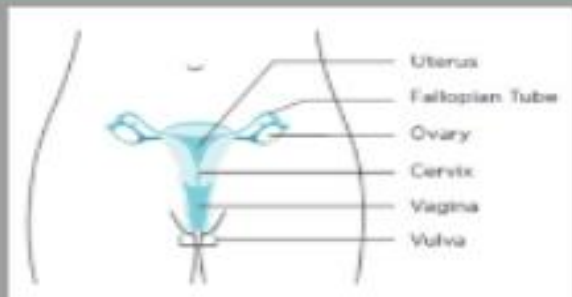
Appendix H: Project Budget

Item	Cost	Covered by
Whitney Boss DNP Student	\$40 x 180 hours = \$7,200	In kind donation of author
Sarah Johnson DNP Student	\$40 x 180 hours = \$7,200	In kind donation of author
Ingrid Kwak DNP Student	\$40 x 180 hours = \$7,200	In kind donation of author
Educational Materials	\$100	Provided by SHGFM
Tip Sheet & Checklist	\$78.22	In kind donation of authors
Food for Staff		In kind donation of authors
Apple Cider & Doughnuts	\$40	
Panera Bread Lunch	\$168.97	
Cookies	\$10.98	
Candy	\$53.24	
Total Estimated Cost	\$22,051.41	

Appendix I: Women's Handout (front side)

Women's Health

Cervical Cancer Screening



Female anatomy. Image obtained from https://www.cdc.gov/cancer/cervical/basic_info/

What is cervical cancer?

Cervical cancer is a cancer that develops in your cervix, or the lower portion of the uterus which connects to the vagina. It is more common in women over age 30.

Risk factors for developing cervical cancer:

Nearly every case of cervical cancer is caused by the Human Papillomavirus (HPV). HPV is a common virus that is passed from person to person during sexual intercourse. HPV is so common that nearly every sexually active person will get it at some point in their lifetime. HPV goes away on its own without causing any health problems in most women. However, when it does not go away, it can cause changes within the cervix that can lead to cervical cancer.

Other factors that increase the risk of developing cervical cancer:

- Multiple sexual partners
- Having HIV
- Smoking
- Long-term use of oral contraceptives (more than 5 years)

Signs and symptoms:

There are often no signs or symptoms of cervical cancer, especially in its early stages. With more advanced stages of cervical cancer, signs or symptoms may include:

- Abnormal vaginal bleeding or discharge
- Bleeding after sexual intercourse
- Pelvic pain

How to prevent Cervical cancer:

- Immunization against HPV is one of the best ways to prevent cervical cancer
 - All children ages 11-12 should receive the vaccine
 - Anyone up to age 26 is recommended to receive the vaccine
 - Some adults ages 27-45 may decide to get the vaccine after discussion with their provider
- Screening tests through either the Pap test or HPV testing
- Use condoms during sexual intercourse
- Limit your number of sexual partners

What to know about screening for cervical cancer:

A Pap test, an HPV test, or both a Pap and HPV test are done (based on your age) to screen for cervical cancer.

For women ages 30-64:

- Either a Pap test every 3 years
- Or a Pap test combined with HPV testing every 5 years can be done
- Or just HPV testing can be done every 5 years

Pap Test

A pap test looks for changes in the cells of your cervix which could indicate precancer. It only takes a few minutes to complete.

- A Pap Test is done every three years in women ages 21-29.

HPV Test

An HPV test looks for the Human Papilloma Virus, which could then lead to cellular changes or precancer of your cervix.

Image of Pap Test




Image obtained from <https://www.mayoclinic.org/diseases-conditions/cervical-cancer/diagnosis-treatment/drc-20262508>

Appendix I: Women's Handout (back side)

Women's Health Screening Checklist:



Cervical Cancer Screening:

☐ 21-29 yrs: Pap every 3 yrs

Last Pap Test: _____

Next Due: _____

☐ 30-65 yrs:

☐ Pap alone every 3 yrs

Last Pap: _____

Next Due: _____

☐ HPV testing alone every 5 yrs

Last HPV test: _____

Next HPV test: _____

☐ Co-testing Pap & HPV every 5 yrs

Last Co-test: _____

Next Co-test: _____

☐ Hysterectomy with removal of cervix: No screening

Removal Date: _____



Immunizations:

Annual influenza vaccine:

Last Dose: _____

Next Due: _____

Tetanus diphtheria and pertussis (Tdap) vaccine every 10 yrs:

Last Dose: _____

Next Due: _____



Breast Cancer Screening:

40-75 yrs (average risk)

Repeat every 1-2 yrs; yearly after age 55

Last Mammogram: _____

Next Due: _____

Osteoporosis Screening:

Last bone mineral density screening/DEXA scan: _____



Colorectal Cancer Screening:

45- 75 yrs

Cologuard- stool DNA test every 3 yrs

Colonoscopy- every 10 yrs

Last screening and method of screening: _____

Next Due: _____

Infectious Disease Screening:

Hepatitis C One time screening (18-79 yrs): _____

HIV One time screening for HIV (15-65 yrs): _____

HPV vaccine (11-26 years, or 27-45 if provider recommends):

1st Dose: _____

2nd Dose: _____

3rd Dose: _____

Herpes Zoster (Shingles) vaccine (for those over age 50):

1st Dose: _____

2nd Dose: _____

Appendix J: Questionnaire with Pre-and Posttest

Please answer questions 1-7 prior to today's presentation:

1. What is your current role:

- . DO
- . MD
- . Resident
- . NP
- . PA
- . RN
- . MA
- . LPN

2. How long have you been in your current role:

- . <1 year
- . 1-5 years
- . 6-10 years
- . 11-15 years
- . >16 years

3. How satisfied are you with the current EHR alert system for preventive health screenings?

- . Unsatisfied
- . Somewhat unsatisfied
- . Neutral
- . Somewhat satisfied
- . Completely satisfied

4. What do you do when you see overdue health screening alerts in the EHR?

- . I don't address health screening alerts
- . Address them in the moment at that visit
- . Wait for the patient's annual well-woman visit to address preventive health topics
- . Other:

5. What do you feel are the greatest barriers to patients receiving Pap testing? _____

6. Please rate your level of confidence in understanding the current guidelines related to cervical cancer screening with Pap and HPV testing:

- . Not confident at all
- . Somewhat confident
- . Not sure
- . Confident
- . Very confident

7. Please rate your level of confidence in recommending cervical cancer screenings to patients based on current practice guidelines:

- Not confident at all
 - Somewhat confident
 - Not sure
 - Confident
 - Very confident
-

Please answer the following questions after the brief educational session:

8. Please rate your level of confidence in understanding the current guidelines related to cervical cancer screening with Pap and HPV testing (after the educational presentation):

- Not confident at all
- Somewhat confident
- Not sure
- Confident
- Very confident

9. Please rate your level of confidence in recommending cervical cancer screenings to patients based on current practice guidelines (after the educational presentation):

- Not confident at all
- Somewhat confident
- Not sure
- Confident
- Very confident

10. Today's brief educational presentation was helpful:

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Appendix K: Pretest and Posttest Results

<i>Measuring difference between pre and post test of confidence in understanding current guidelines (comparison of questions 6 in pretest and 8 in posttest)</i>			
PROVIDER	Pre	Post	Change
DO 1	4	4	0
DO 2	5	5	0
RESIDENT 1	2	4	2
RESIDENT 2	4	4	0
RESIDENT 3	4	5	1
PA 1	2	4	2
PA 2	4	4	0
RN	2	4	2
MA 1	4	5	1
MA 2	4	4	0
MA 3	3	5	2
MA 4	3	4	1
MA 5	4	4	0
MA 6	4	4	0
P-Value:			0.005818124959

*Measuring the difference between pre and post test in **confidence in recommending** cervical cancer screening (comparison of question 7 in pretest and question 9 in posttest)*

PROVIDER	Pre	Post	Change
DO 1	4	4	0
DO 2	5	5	0
RESIDENT 1	2	4	2
RESIDENT 2	4	4	0
RESIDENT 3	4	5	1
PA 1	2	4	2
PA 2	4	4	0
RN	4	4	0
MA 1	5	4	-1
MA 2	4	4	0
MA 3	4	4	0
MA 4	4	4	0
MA 5	4	4	0
MA 6	4	4	0
P-Value:			0.2177963945

<i>Posttest Question 10: "Today's brief educational presentation was helpful"</i>					
PROVIDER	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
DO 1				X	
DO 2			X		
RESIDENT 1				X	
RESIDENT 2				X	
RESIDENT 3					X
PA 1				X	
PA 2				X	
RN				X	
MA 1					X
MA 2				X	
MA 3					X
MA 4				X	
MA 5					X
MA 6				X	
TOTAL = 14					

Appendix L: Cervical Cancer Screening Data

	Total Women (21-64)	Appointments made	CCS performed	% of Appointments Made	% change between four week periods	Average % Appointments Made	% of CCS performed	% change between four week periods	Average % CCS performed
8/1 - 8/29 (12 weeks prior)	366	25	31	6.83		5.46	8.47		7.35
8/30 - 9/27 (8 weeks prior)	295	13	17	4.41	-35.48		5.76	-31.96	
9/28 - 10/26 (4 weeks prior)	448	23	35	5.13	16.50		7.81	35.57	
10/27 - 11/24 (4 weeks in)	457	20	23	4.38	-14.76	4.73	5.03	-35.58	6.35
11/25 - 12/23 (8 weeks in)	413	20	23	4.84	10.65		5.57	10.65	
12/24 - 1/21 (12	403	20	34	4.96	2.48		8.44	51.49	

weeks in)									
1/22 - 2/18 (4 weeks post)	404	18	28	4.46	-10.22		6.93	-17.85	

Appendix M: Staff Tip Sheet

Cervical Cancer Screening Intervention Tip Sheet

Cervical Cancer Screening Tool:

Step 1: Women's Health Screening Checklist

Checklist

- MA's will fill in this sheet out for **ALL** female appointments between **21-65 years** from the Gaps in Care data in Epic during chart prep

Step 2:

- MA's will give the filled-out sheet to providers

Step 3:

- Providers will go over both the educational side (Women's Health Cervical Cancer Screening) & the Women's Health Screening Checklist with **every** female seen in the office between **21-65 years**

Step 4:

- Providers will encourage patients to:
 - Have cervical cancer screening done that day or schedule an appointment to have it completed (if due) before they leave
 - Take home the checklist to be active participants in their health maintenance

Step 5:

- Both MA's & Providers give Julie feedback:
 - What is going well? What is not going well?
 - Any barriers or struggles you are encountering?
 - Is this tool helpful?
 - Does the tool need modifications?
 - How are patients responding?

Checklist:

Women's Health Screening Checklist:

Cervical Cancer Screening:

- ☐ 21-29 yrs. Pap every 3 yrs.
Last Pap Test: _____
Next Due: _____
- ☐ 30-65 yrs.
☐ Pap every 3 yrs.
Last Pap Test: _____
Next Due: _____
- ☐ HPV testing alone every 5 yrs.
Last HPV test: _____
Next HPV test: _____
- ☐ Co-testing Pap & HPV every 5 yrs.
Last Co-test: _____
Next Co-test: _____
- ☐ Hysterectomy with removal of cervix. No screening.
Removal Date: _____

Immunizations:

Annual influenza vaccine:
Last Date: _____
Next Due: _____

Tetanus diphtheria and pertussis (Tdap) vaccine every 10 yrs:
Last Date: _____
Next Due: _____

Breast Cancer Screening:
40-75 yrs (average risk)
Mammogram every 1-2 yrs. yearly after age 55
Last Mammogram: _____
Next Due: _____

Osteoporosis Screening:
Last bone mineral density screening (DEXA scan): _____

Colorectal Cancer Screening:
45-75 yrs
Screening: stool DNA test every 3 yrs.
Colonoscopy every 10 yrs.
Last screening and method of screening: _____
Next Due: _____

Infectious Disease Screening:
Hepatitis C One time screening (18-79 yrs): _____
HIV One time screening for HIV (15-65 yrs): _____
HPV vaccine (11-26 years, or 27-45 if provider recommends):
1st Dose: _____
2nd Dose: _____
3rd Dose: _____
Herpes Zoster (Shingles) vaccine (for those over age 50):
1st Dose: _____
2nd Dose: _____

Education for Patients:

Women's Health Cervical Cancer Screening

What is cervical cancer?
Cervical cancer is a cancer that develops in the cervix, the lower part of the uterus which connects to the vagina. It is more common in women over age 30.

Risk factors for developing cervical cancer:
Nearly every case of cervical cancer is caused by the Human Papillomavirus (HPV). HPV is a common virus that is passed from person to person during sexual intercourse. HPV is so common that nearly every sexually active person will get it at some point in their lifetime. HPV goes away on its own without causing any health problems in most women. However, when it does not go away, it can cause changes within the cervix that can lead to cervical cancer.

Other factors that increase the risk of developing cervical cancer:

- Multiple sexual partners
- Smoking
- Long-term use of oral contraceptives (more than 5 years)

Signs and symptoms:
There are often no signs or symptoms of cervical cancer, especially in its early stages. With more advanced stages of cervical cancer, signs or symptoms may include:

- Abnormal vaginal bleeding or discharge
- Increasing pelvic or sexual discomfort
- Painful sex

Image of Pap Test

Pap Test
A pap test looks for changes in the cells of your cervix which could indicate precancer. It only takes a few minutes to complete.
A Pap Test is done every three years in women ages 21-29.

HPV Test
An HPV test looks for the Human Papillomavirus, which could then lead to further changes or precancer of your cervix.

How to prevent Cervical cancer:

- Immunization against HPV is one of the best ways to prevent cervical cancer.
- At 11-12 years of age, 11-12 should receive the vaccine.
- Starting up to age 26, it is recommended to receive the vaccine.
- Some adults ages 27-45 may decide to get the vaccine after discussion with their provider.
- Screening tests through either the Pap test or HPV testing.
- Use condoms during sexual intercourse.
- Limit your number of sexual partners.

What to know about screening for cervical cancer:
A Pap test, an HPV test, or both a Pap and HPV test are done based on your age to screen for cervical cancer.

For women ages 30-64:

- Either a Pap test every 3 years
- Or a Pap test combined with HPV testing every 5 years can be done
- Or just HPV testing can be done every 5 years